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The beekeeper. Vol. I, No. 2 November 15, 1879

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AN INDEPENDENT MONTHLY JOURNAL OF PRACTICAL AND SCIENTIFIC APICULTURE.

VOL. I., No. 2.

NOVEMBER 15, 1879.

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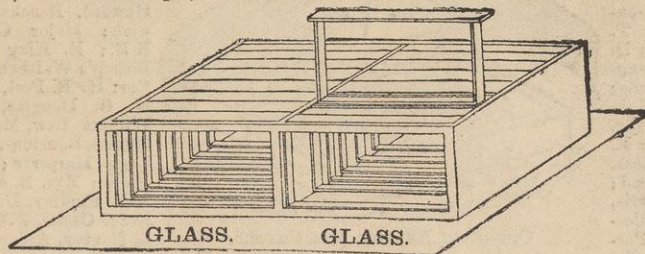
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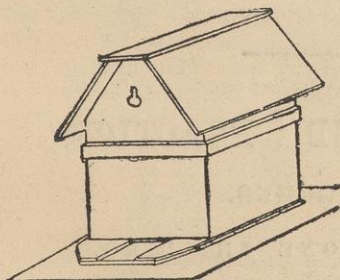
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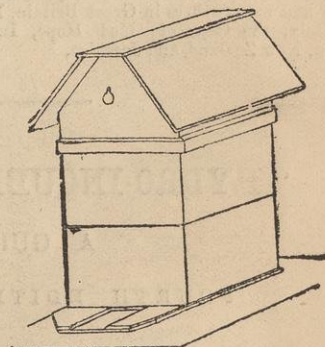


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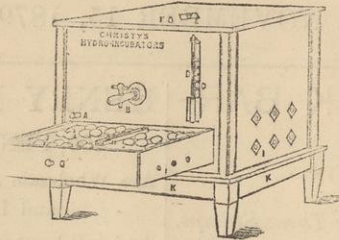
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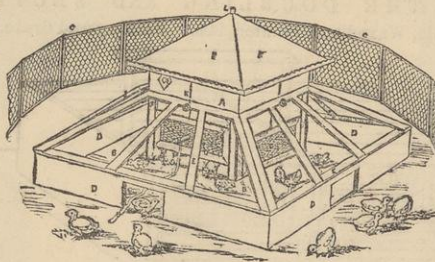
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THE BEEKEEPER:

AN INDEPENDENT MONTHLY JOURNAL OF PRACTICAL AND SCIENTIFIC APICULTURE.

OUR MONTHLY PRIZE COMPETITION.

OUR judges for the essays on "Wintering Bees" are two in number, the casting vote, if necessary, to be given by the Editor. One judge is an experienced apiarian, the other is all but totally ignorant of bee matters. The former chose the essay by Mr. Raitt, the latter that by Mr. Noyes, as he could understand it better. They were both of opinion that these essays were the *two* best, but could not agree which was *the* essay. The decision was left to us, and after reading both we came to the conclusion that there was "much to be said on each side." To overcome the difficulty of decision we wrote to the authors and asked if they would agree to share the prize. Each courteously signified his assent to the proposition, and we owe them our thanks, for we are the gainers by the transaction. We hope our readers will be gainers too, for we are now able to present them with two essays instead of one on a subject which is, without exception, the most important to beekeepers. We hope that those of our subscribers who have sent essays, but have not obtained the prize, will not be discouraged, but will try again.

WINTERING BEES.

By W. RAITT (Blairgowrie, N.B.).

MODERN hives, especially those with movable combs and modern systems of management, are necessarily to some extent an interference with Nature, and to that extent must be held responsible for the principal evils connected with wintering, such as chill, damp, mouldy combs, insufficient stores, and dwindling. Stocks whose natural abodes are the roomy and substantial hollows of forest trees, and which are left in the undisturbed possession of the accumulated stores of years, are believed to be entirely free from such evils. But as we cannot afford to keep our bees under such conditions, it remains for us to meet those evils of our own creating by treatment at once scientific and as nearly as possible in accordance with Nature. Our aim, therefore, will be to correct the results of over-swarming by helping our bees to recover their strength, to lessen as far as possible the usual fall dwindling by encouraging our bees to stay at home, to restore an equivalent for the honey we may have appropriated, and then to place our strong, healthy, and well-provisioned stocks in winter quarters, such that during the winter months a state of contented quiescence may be induced, the consumption of stores reduced to a minimum, and such evils as chills and damp avoided. In order to attain such results four things must be attended to.

I.—THE CONDITION OF THE BEES.

The fall months are unusually fatal to bees. They venture forth in all weathers in search of food, many of them already almost worn out with the hard work of the honey harvest, and fall a prey to chill, rain, birds, and other enemies, so that, unless assisted by man, November finds the stock that in July filled hive and supers reduced to a third of its former strength, and even these mostly old bees that cannot possibly survive to see an April sun. It is midsummer before such stocks regain strength sufficient to gather surplus stores. Such, however, is even considered

a fair result under the let-alone system. Now we want our stocks not merely to *live* till spring; we want them to be strong enough to store surplus even from the May blossoms of the garden and orchard. In order to this we must take them in hand immediately after the close of the main honey harvest, and by continuous but slow feeding encourage the rearing of brood during the autumn months when otherwise breeding would entirely cease. The result will be that we shall be prepared to go into winter quarters with stocks strong in numbers and vitality, and with a large proportion of young bees that will live even into May. Such stocks are the more easy to winter safely because, as has been well said, "The best winter protection for bees is *bees*."

II.—THE CONDITION OF THE COMBS.

Of course, in skeps and other hives with fixed combs there is but little choice in the matter of combs, but in bar frame hives it is well to select moderately old combs for wintering as being better heat retainers, and to reject all that are mouldy or moth eaten. The selected combs should be arranged so that the central ones shall be of all worker cells, and having, at least, the lower third free from sealed stores. Outside of these the heavier combs, and those with a proportion of drone cells, should be arranged. One or more half-inch winter passages may be cut near the middle of each comb to prevent the possibility of any portion of the cluster becoming detached during very cold weather, when the bees shrink into less space, and to enable them to reach their stores without having to travel round the edges of the combs, in attempting which many are chilled and the whole cluster is in danger of perishing for want, while plenty of food may be on the other side of the comb against which they are hanging. Under the system of packing, afterwards recommended, such winter passages are not required, and we, therefore, dispense with them, and save our combs from disfigurement.

III.—THE SUPPLY OF FOOD.

It is now beyond question that it is profitable for the beekeeper to extract the whole or the greater part of the honey found in the hive at the close of the honey harvest, and feed back sugarsyrup instead. It is also highly advantageous to the bees. As we have seen, it induces brood-rearing long after it would naturally cease, and it is also more wholesome than many kinds of honey, especially that known as honey dew. Care must, however, be taken that such food be almost entirely sealed before winter arrives. This will generally be the case when the syrup is made of a proper consistency, and the hive is kept warm yet well ventilated, so as to throw off all excess of moisture. We, however, avoid risk in this matter by abandoning the syrup feeding as soon as the weather becomes too cold for the bees to fly. Instead of the syrup we then supply cakes of candy (*a*) in which wheaten flour is an element. These, cast in common soup plates, are slipped under the quilt, and are greedily taken by the bees. Unlike barley sugar they do not deliquesce, and yet are very easily dissolved, and the product is just ready for immediate sealing. They further supply the nitrogenous element without which brood-rearing cannot go on, and in seasons like the present, when pollen is scarce, this is a great advantage.

As to quantity no fixed rule can well be given, but we consider that when all the combs which the bees can cover,

say, by 1st November, are two-thirds filled with sealed food, they are safe till at least the 1st of March, when an examination should be made.

IV.—THE HIVE AND PACKING.

By the 1st of November, at latest, the above conditions should, with proper attention, have been attained, and we shall suppose ourselves engaged in final preparation for the advent of frost and snow. We overhaul all hives to see that there are no open joints, seal skeps to their floorboards, and thatch them with straw, or place them and any other kind of hive not otherwise rain-proof under a roof or shed. If possible, we provide all single-sided hives with an outer casing such as will allow a space all round for packing with chaff or other light, non-conducting material. Bar frame hives we further treat to an inside packing, as follows:—We remove and store in a dry place all combs found outside the cluster of bees, taking care to leave sufficient stores as previously mentioned. Light division boards are placed on either side of the remaining combs (*b*), and the spaces outside are filled loosely with oat-chaff to the level of the frames. A candy cake or some sticks of barley sugar are now placed across the frames, a thin quilt spread over all, and, if the hive sides allow of it, two or three inches of loose chaff are packed over all, so as to fill every corner. As the candy is eaten away it leaves a dome under the quilt in which, as the warmest part of the hive, the bees generally nestle, and are thus independent of any other winter passages. As hives are generally made with sides no higher than the top bars of the frames, some such device as a light wooden tray with cloth bottom may be filled with the chaff that is to go over the quilt; or a cushion may be filled with the same material; or, better still, the roof itself may be made the cushion, as follows:—Turn it up, half fill it with loose chaff, tack a square of thin cloth over the mouth, and replace it on the hive. In any case the roof should have ventilating holes to allow condensed vapours to dry out.

The effect of such careful packing will be that an almost uniform heat will be maintained; extreme cold as well as the sudden rises of temperature which tempt the bees out to perish on the snow will be avoided. The natural heat of the bees will be conserved at a minimum expenditure of food. Exhaled vapours instead of condensing inside will pass upward through the chaff covering, and mould and dysentery will be unknown. Breeding will recommence at an earlier period than in hives unpacked, and when begun it will go on in proportion to the greater heat of the brood compartment. And here it should be said that none of the packing should be removed in spring till the bees are actually crowding their combs, and even then just enough to admit of a single fresh comb being introduced at a time.

Packing being finished, doorways should be gradually contracted till not more than an inch in length and a quarter deep, so as to exclude mice and preserve heat, and they may be shaded during gleams of sunshine while snow is on the ground, and occasionally searched with a bent wire in case they may get closed by dead bees. Otherwise the less the hives are disturbed the better, the great matter being to keep the bees in a quiet and contented condition as long as possible. Where poverty is known to exist, only solid food, candy cake, or barley sugar, should be given, as liquid food stimulates to a too sudden activity, which urges many forth to their destruction.

(a.) HOW TO MAKE CANDY.—In a common iron pot on a good red fire put as many pounds of sugar as may be thought sufficient

for the occasion, and add a small quantity of hot water—say a pint—to every 3lb. of sugar; stir constantly, and allow to boil briskly for ten or fifteen minutes. Then *try* it by taking a few drops in a spoon and holding it in cold water for a few seconds. If stiff enough to draw into a thread, take the pot from the fire and set it on a cold floor. If poured out at this stage the mass on cooling would either be a very thick syrup or clear barley sugar with a tendency to deliquesce in a damp atmosphere. But if we continue to stir it briskly as it cools, we induce the sugar to crystallise with a very fine grain, and at the same time to absorb all excess of water. We therefore continue the stirring, and, after a few minutes, gradually add wheaten flour in the proportion of a small handful to each pound of sugar. In a short time the mass will begin to thicken by granulation. We then lose no time in pouring it out into soup plates, in each of which a sheet of thin paper has been laid to prevent sticking. In half an hour or so the cakes will be firm, and can be removed from the plates. The paper need not be removed except the loose edges. Should the mass in the pot become solid before it can all be poured out, it should be returned to the fire for a few seconds. Bar frames, with bottom bar the same width as the sides, may be moulded full of the candy and hung in the hive; but the cakes moulded as above are in a most convenient form for slipping under the quilt of a hive. Those prepared with flour almost always induce breeding. There is generally a difficulty in getting the flour added without making knots, but I find no trouble with these. The bees eat the greater part of them, and throw out only the pellets of dry flour they may contain.

(b.) HOW SHOULD THE FRAMES RUN IN A HIVE?—In connection with the subject of wintering it may not be out of place to consider what arrangement of combs is to be preferred, whether from front to back or from side to side across the entrance. Every observant beekeeper knows that at the commencement of winter the bees are generally, if not always, found clustering close to the doorway. I have found them continue to do so even when reduced to a mere handful. They are naturally led to take this position partly that with their own mass they may contract the doorway and keep the hive warm, but chiefly that they may be at hand when attacked, as they constantly are in autumn, by wasps and robber bees by day and moths by night. As the season advances they are compelled to fall back on their stores; when the combs run from front to back these stores are all above and behind them, but with the combs from side to side they are forced to start in the middle and eat their way towards one side of the hive, leaving half their stores behind them. The result, especially in hives with very long combs, might in a severe winter be fatal—the bees starving at one end of the combs while plenty of food was at the other. There are decided objections to having combs in this position even in summer, but in winter we consider the arrangement positively unscientific and harmful.

WINTERING BEES.

By REV. R. J. NOYES, B.A.

WE will suppose the reader has only straw hives or skeps. Of course you do not destroy your bees to take their honey. To do so is most cruel, unnecessary, and a great loss to the beekeeper. That it is cruel nearly all who practise it will admit, but they do not know of any other way of management. It is unnecessary, because you can take any portion or the whole of the honey collected by the bees without killing any of them. It is also a great loss to destroy colonies or stocks of bees, since every hive of bees destroyed in the autumn would, if spared, and given proper attention, live through the winter, and make an additional honey gathering colony the following summer. Thus the number of a beekeeper's hives should be continually increasing year by year if he wishes, instead of his never possessing more than three or four. We will assume, then, that you wish to follow a better plan, and also that, having heard of or seen movable frame hives, you are thinking of transferring your bees from their present homes to these modern and far more useful hives next year; but you now need to know what to do, so that your stocks of bees may have

every prospect of living through the winter and come out strong next spring. Now, first of all it is most important that all your colonies be strong when they go into winter quarters. If you have any weak hives—those in which the bees are few in number—make two weak stocks into one, or, if you have only one weak stock, join it to another that is stronger. A weak stock will be no profit, even should it live through the winter. To carry out this advice, known amongst beekeepers as “uniting,” bring the two hives near to one another, if they do not stand side by side, by removing them a little nearer and nearer to each other every fine day. Blow a few puffs of smoke into each skep, and then drive the bees from both by drumming, and after sprinkling them with *thin* syrup, scented with peppermint, removing, if possible, the oldest or least valuable queen. Shake each lot into an ordinary metal pail, well mix them by a rotatory motion, and then pour them into one of the skeps, or permit them to take possession of it by throwing them down upon a sheet spread out upon the ground upon which the hive has been placed, the entrance end propped up with a stick. Afterwards it should be removed to a stand fixed between the two places lately occupied by the driven stocks. The methods of proceeding with bar-frame hives may be learned from the different books and leaflets on beekeeping or through the monthly journal, THE BEEKEEPER. Uniting should be performed early in the autumn if possible. And now you must be sure that your bees have sufficient food for their winter use. Nothing that has life can live and keep itself warm without food. Bees would die from the cold of winter did they not cluster together and give out heat from their bodies. By this means they keep their hives at a certain warmth all through the winter, and to do this they require food. As a matter of fact they eat about 2½ lb. of honey a month during the winter, and therefore no skep ought to be left under the weight of 20 lb., though it is recommended as safer that they should weigh from 25 lb. to 30 lb., especially if the combs are old. If, then, your hives weigh less than 20 lb. at the beginning of September you must begin to feed. Before explaining how this should be done let us speak of another matter which must be attended to to ensure safe wintering. Your hives must contain plenty of *young* bees. Bees hatched in spring and summer are soon worn out, and only live about six weeks; but bees hatched in autumn, living quietly in the hive, last until next spring. The importance of young bees is evident, so *feed slowly* in autumn to *keep up the breeding*. Breeding is known to be progressing when the bees carry in pollen (the dust of flowers) into their hives. Make some syrup by boiling 2 lb. of sugar in a pint of water, to which add, whilst boiling, two teaspoonfuls of vinegar. Boil a quarter of an hour. Partially fill a wide-necked bottle and place it upon a feeding stage over the feed hole in the crown of the skep, or cut out of the quilt covering the top of a frame hive. If you have no holes cut in the crown of your straw hives, by all means make them, quieting the bees with a little tobacco smoke. To make a feeding stage, take a piece of wood a few inches square, cut out a hole in the centre two inches in diameter, and nail over it a piece of tin, or zinc, or vulcanite, perforated with one or two holes—*not more*. To place on the bottle, put a smooth piece of tin or a piece of glass over its mouth, sharply turn it over, and then slide it on the stage. Feed daily, and the bees—being unable to get the syrup except through the one hole, or two at most—will be fed *slowly*, and breeding will be continued. Cover

up the bottle to keep away robber bees. At the end of September bring up the hive to the necessary weight by feeding rapidly with thick syrup (2½ lb. to a pint of water). Feed rapidly by piercing more holes in the tin, zinc, or vulcanite, or use a piece of perforated zinc instead. It will well repay you to feed. And now, your bees being strong in numbers, and provided with sufficient food, we must attend to ventilation, and also see that they are protected from cold and wet. No living thing can exist for long in impure air. All living things breathe out poisonous air. Bees, like human beings, require ventilation of their dwellings, or the means of escape of bad air and the entrance of fresh air in its place. The best known method of ventilating frame hives is to cover the top of the frames, first with a covering of ticking or hair cloth, cut to the size of the hive, and then with two or three thicknesses of house flannel. This is called the “quilt.” With skeps, after removing the feeding stage, place over the feed-hole a flat bag made of strong brown calico, filled with the dried fronds of the brake fern, collected in October, or pieces of carpet may be used. These should be put on at the end of October, when the bees have no chance of covering them with the kind of glue they carry into their hive called propolis, which spoils ventilating covers. Some recommend that the entrance be narrowed during the winter to about three-quarters of an inch. Others prefer to cover with a piece of perforated zinc, with a three-quarter-inch entrance hole cut out.

Lastly, see that your hives are well protected from rain. The best frame hives are sufficiently protected; but if your hive is of the “makeshift” type, get a box of suitable size, remove the lid and bottom, make an entrance hole corresponding with the hive entrance, place it over, and pack in between it and the hive shaving, straw, or fern fronds. Take care to leave the entrance free. Some may also be placed over the quilt, and then a perfectly rain-tight, slanting roof should cover all. A hole should be made in the box cover just underneath the roof, back and front, and covered with perforated zinc, to allow the circulation of air. Straw hives may be similarly treated. They frequently stand without any other protection than straw hackles, a felt covering, or a milk pan; but it would be better to tie some old flannel round the top of the skep, underneath the felt covering or milk pan. It only remains to add that in movable-frame hives holes should be cut in the combs half an inch in diameter and three inches from the top of the frame, in order that the bees may pass from comb to comb without leaving the cluster, for in lengthened periods of extreme cold they have sometimes starved where these have not been made, although there was plenty of honey in the hive. Floor boards should be cleaned before winter; the entrances should be shaded after snow has fallen, or the glare will attract many of them out to their destruction; and snow should be cleared away from alighting-boards at hive entrances. Examine the entrances from time to time; if clogged with dead bees, remove them with a piece of hooked wire.

If the above matters be attended to you may fairly be confident of the successful wintering of your bees, and in the following spring you will be gladdened by their prosperous condition, and if favoured with a fine season may look for an abundant harvest.

E. SMITH, Esq., Surgeon, Sherston, writes:—“I have tried BUNTER'S NERVINE in many cases of severe Toothache, and in every instance permanent relief has been obtained; I confidently recommend it.”—Advt.

A PROFESSOR OF APICULTURE.

A FEW STATISTICS.

SOME little time ago Mr. Rose, in a letter to the *Globe*, suggested that the Science and Art Department of the Government should be applied to to give increased facilities for instruction in apiculture. We are glad to see that this letter is likely to have some effect. At the last meeting of the Committee of the British Beekeepers' Association (15th October) the question was brought forward, the Rev. E. Bartrum observing that he considered that some steps should be taken with a view of inducing the Government to appoint a Professor of Apiculture in connection with the Science and Art Department of South Kensington, while the Hon. Secretary of the Association (Rev. H. R. Peel) reported that he had already had an interview with Major Donnelly at South Kensington. The only drawback is that the question was "deferred until a future meeting," *i.e.*, we imagine, another quarter. It is rather a pity to waste so much valuable time, for a great deal may be done in three months.

While we are on the subject we offer the Association another suggestion. Cannot the authorities of the South Kensington Museum be induced to exhibit examples of modern hives and hive appliances at the Museum? There are doubtless many hive makers who would hail such a concession as a great boon, and would willingly send specimen hives, and it is certain that a permanent exhibition of this kind would do much to advance and improve bee culture in this country. The museum is not visited by Londoners only. We once heard it said that out of every three people who go sightseeing in London, or visiting places of amusement, two are from the provinces. A collection of hives at the South Kensington Museum would attract much more attention than any exhibition such as that mentioned in our last (page 10) as a suggestion from one of our subscribers. As a proof of the interest taken in bee culture in England and Scotland, we may mention that we have a list containing 5,863 names of persons keeping bees! And we take this opportunity of again thanking those gentlemen who have so kindly helped us with lists of names. When we published the *BEEKEEPER* we had 2,640 names only—the others we have received from friends, mostly unsolicited. We had an idea that beekeeping was a practice more largely indulged in than was generally supposed, but these figures astonished us.

To take only those names we have received, we may, we think, safely suppose that on an average one-tenth of these are owners of two hives, for our correspondents have, they tell us, given us only the names of pretty well known beekeepers. But we know that ten of these beekeepers keep between them 282 hives. Taking ten from 5,863 we have 5,853. Adding ten per cent. we have 6,438, and adding again 282 we have the total result of 6,720 hives! Judging from the names we have received we imagine that very few of these are of the cottager or labouring class. If we had the name of *every* beekeeper we wonder how many hives we should have to count then?

We shall feel greatly obliged if any of our readers will send us in further names. We intend to write to a few of our subscribers asking them to do so.

[Since the above was printed we have received three more lists containing together nearly 400 names. We have also had our attention drawn to a paragraph in the *Agricultural Gazette*, of the 10th inst., which, speaking of the *BEEKEEPER*, says:—"What a curious blot is that which it hits in the official instructions for the inquiry by the Royal Agricultural Com-

missioners! The honey interest of America is especially included in the inquiry, while that of Great Britain is excluded from consideration."]

POLLEN AS BEE FOOD.

By J. G. DESBOROUGH.

WERE writers on bees and bee management to confine themselves to the assertion of facts which they had themselves ascertained to be true, or could in default refer to some actual experiment which had been carried out to support their assertion, beekeepers would not so often be misled and induced to adopt management which so often leads to disappointment and loss.

I allude to a very few words in the article in your last issue on the "Past Season and Feeding," by "An Old Beekeeper," "for without pollen bees will not breed." This same question was also in some degree under discussion at the recent *Conversazione* of the British Beekeepers' Association.

I also am an old beekeeper, and I send you below an extract from a paper communicated by me to the Entomological Society, and read on the 2nd April, 1855, in continuation of my prize essay on "The Duration of Life in the Honey Bee," and which will, I think, show the "Old Beekeeper" to be mistaken in his broad assertion, and is a proof that bees will breed without pollen:—

On reference to the notes of the year 1853 it will be seen that the 6th March was the first day of pollen being collected. Now, on that day 729 bees had been reared and sealed over without a particle of pollen or bee bread being present in the hive; all had been consumed previously. This I can speak to positively, because by removing the covers from opposite sides of any division of the hive, I was enabled to look through the comb, and on doing this no bee-bread could be seen; the cells were all clearly to be seen through. I am now speaking of the month of February. I had fully expected to see brood before that time, and finding no bee-bread and the season being so backward that none could be collected, I naturally attributed the want of brood to the absence of pollen. I therefore cut up the comb from a dead hive and supplied pieces containing pollen, but the bees in the observatory would not touch it, and when I saw brood and that the bees refused to eat the pollen, I removed the comb altogether; and I can positively aver that then 729 bees were reared with no other food than honey; honey, and honey alone, is the food of the grub of the bee. Since that time I have anxiously watched the parts of the hive where bee-bread has been deposited, and the matured bees *during the night* may be observed feeding on the bee-bread; indeed, almost every cell containing pollen will have a bee half in the cell eating pollen. The pollen is mixed with honey, and this is likewise done in the night, as the cells containing bee-bread fresh brought into the hive may be seen in an afternoon dry, and the pellets may be distinguished, but the next morning all traces of such pellets will be gone, and the surface of the pollen in every cell will be smooth and evidently mixed with honey.

The result, then, of the observations made during the period of two years and a-half is the proof of these two facts in bee economy—*viz.*, that the impregnation of the queen extends over more than one season, and that the food of the bee in the grub state is honey, and not farina or pollen. Though these may not be considered very important, yet when they can be asserted not merely as speculative theories, but as clearly-demonstrated facts, it must be a further step to the more perfect knowledge of the habits of the insect.

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THE BEE.

No. II.

WE must now consider the structural difference in the three kinds of bee to be found in our hives. Though the queen, as a female, is more completely endowed than a worker, the latter is more perfectly formed as far as regards those organs which are required for honey and pollen gathering and comb manufacture. The worker's tongue (*ligula*) is much longer, and she is thus better able to dip deep into the parts of the flower where the honey is secreted; and it is hairy and more jointed, enabling the insect to gather the nectar and, by bending the tongue back, to deposit it in the honey-bag or stomach, from whence it has the power to reject it at will when it wishes to add to the stores in the cells or to feed other bees. The worker's tongue, when not in use, is doubled back beneath the throat. The tongue of the drone is short, like that of the queen. In Italians the tongue is longer than in our native bees, and they can gather honey from red clover and other such flowers which are inaccessible to our own bees. The jaws, or *mandibles*, of the worker are stronger than those of the queen and drone, while the latter have a rudimentary tooth which is wanting in the former. The jaws of the worker can close more tightly than those of the other bees, and are therefore better adapted for the work of cutting comb, kneading wax, &c. The jaws in all of them, as with most insects, move sideways instead of up and down. The eyes, again, are different. Insects generally have two kinds of eyes—the compound eyes, which are large and can be seen without a microscope in the cases of insects as large as bees, common house-flies, &c.; and the simple eyes, or *ocelli*, which are generally too small to be seen by the naked eye. The marvellous way in which all the organs of the bee are so well adapted to their wants is well exemplified in the eyes. The large compound eyes, which are of use for taking sight generally, in the drone meet at the top of the head; while the *ocelli*, the eyes which are used for looking at things minutely, are crowded, and at the below part of the head, as if a drone had occasion, as it seems to have, only to notice what was "placed before its nose," as the saying goes. The queen and worker, both of which depend a great deal upon sight,* have the compound eyes far apart, and the *ocelli* are at the foremost part of the head, enabling them to look about, above, and below, and examine carefully and minutely whatever they wish to see. The difference can be better appreciated if we can imagine a dog, or some other animal which goes on "all fours," having its eyes below its jaws. Like nearly all other insects, have three of these *ocelli*, or simple eyes—two in a line above and one below, as if at the three angles of a scalene triangle.

The antennæ at first sight seem much alike in all three kinds of honey bee, but a closer examination will show that in the queen and worker they are more delicate, have more easily worked joints, and are slightly longer than in the drone. The use of the antennæ in insects is a matter of much dispute, but we can do no harm in quoting here the interesting remarks Professor Cook makes about them in his "Manual of the Apiary":—

"The antennæ are the horn-like jointed organs situated between or below and in front of the large compound eyes of all insects. They are sometimes short, as in the house-fly, and sometimes very long, as in the grasshopper. They are either straight, curved, or elbowed. In form, too, they are very various, as thread-like, tapering, toothed, knobbed, fringed, feathered, &c. It is known that a nerve passes into the antennæ, but their exact function is little understood. That they serve as most delicate touch organs no apiarist can doubt. That they serve as organs of smell or hearing is not proved. That insects are conscious of sounds I think no observing per-

son can doubt. It is proved by the call of the katy-did, the cigala, and the cricket. What apiarist, too, has not noticed the effect of various sounds made by the bees upon their comrades of the hive? How contagious the sharp note of anger, the low hum of fear, and the pleasant tone of a new swarm as they commence to enter their new home. Now, whether insects take note of these vibrations, as we recognise pitch, or whether they just distinguish the tremor, I think no one knows. There is some reason to believe that their delicate touch organs may enable them to discriminate between vibrations even more acutely than can we by the use of our ears. A slight jar will quickly awaken a colony of hybrids, while a loud noise will pass unnoticed. If insects can appreciate with great delicacy the different vibratory conditions of the air by an excessive development of the sense of touch, then undoubtedly the antennæ may be great aids. Dr. Clemens thought that insects could only detect atmospheric vibrations. So, too, thought Linnaeus and Bonnet. Siebold thinks, as the antennæ receive but one nerve, and are plainly touch organs, they cannot be organs of hearing. Grote, for a similar reason, thinks that the densely feathered antennæ of the males of various night moths serve both for smell and hearing. Professor A. M. Mayer and Mr. O'Johnson have, by various ingenious experiments, proved conclusively that the delicate, beautifully-feathered antennæ of the male mosquito are organs of hearing.

"That insects have a very refined sense of smell is beyond question. How quickly the carrion fly finds the carcase, the scavenger the filth, and the bee the precious nectar.

"I have reared female moths in my study, and have been greatly surprised on the day of their leaving their cocoons to find my room swarming with males. These bridegrooms entered an open window in the second storey of a brick building. How delicate must have been the sense by which they were led to make the visit, and thus were made to grace my cabinet. Bees, too, have been known to dash against a shutter behind which were flowers, thus showing the superiority of their perception of odours, as also their poor vision. But odours are carried by the air, and must reach the insect through this medium. Is it not probable that the various breathing mouths of insects are also so many noses, and that their delicate lining membranes abounding with nerve filaments are the great odour sentinels? This view was maintained by both Lehman and Cuvier, and explains this delicate perception of scents, as the breathing mouths are large and numerous, and most so in insects like bees and moths, which are most sensitive to odours. How quickly the bees notice the scent of a strange bee or queen, or the peculiar odour of the venom. I have known a bee to sting a glove, and in a trice the glove would be as a pin cushion, with stings in lieu of pins. Sometimes the bees will dart for many feet, guided by this odour. Yet the odour is very pungent, as I have frequently smelt the poison before I would feel the sting. I have tried the experiments of Huber and Lubbock, and know that such insects as bees and ants will take no note of food after the loss of their antennæ. But we must remember that this is a capital operation. With loss of antennæ insects lose control of their motions, and in many ways show great disturbance. Is it not probable, then, that removing the antennæ destroys the desire for food, as does amputation with ourselves? Kirby believes, with Huber, that there is a secret organ. Huber's experiments, on which he based his opinions, are, as usual, very interesting. He presented a coarse hair dipped in oil of turpentine—a substance very repugnant to bees—to various parts of a bee engrossed in sipping honey. The bee made no objection, even though it touched the *ligula*, until it approached the mouth above the mentum, when she became much disturbed. He also filled a bee's mouth with paste, which soon hardened, after which the bee paid no heed to honey placed near it. This was not so conclusive, as the bee may have been so disturbed as to lose its appetite. I have experimented a good deal, and am inclined to the following opinion. The antennæ are very delicate touch organs or feelers, and are so important in their function and connection that removal produces a severe shock, but further we know but little about their function, if they have other, and

* With all due deference to Mr. S. James, whose article on "How Bees Mark their Location" we quote under "Foreign Notes," in which he says:—"I do not think they (the bees) depend much on seeing, even when they are quite near the hive," Professor Cook also talks about the "poor vision" of the bee.

from the very nature of the problem we will find it very difficult of solution."

The wings, again, are different. In the worker they are long, reaching to the end of the body, light and slim, as befits her greater need for rapid and continued flight. In the drone they are equally long, but heavier, the result being that a worker can far outstrip a drone in speed of flight. In a queen the wing is short, reaching but little more than half way down the abdomen, and weak, causing her to be chary of flying often or far. It is the vibration of the wing which causes the buzzing sound made by insects, and the note is higher or lower as the movement is slow and heavy, or quick and light, as is the case with the strings of the violin. Thus the buzzing note of the worker is a higher one than that of the drone. It is not only, however, the wing which causes the sound, but the muscles of the thorax (the middle of the three parts of an insect, the others being the head and the abdomen). Take a bee, hold it in your hand so that the wings are free, and mark the note made by the buzzing. Then cut off the wings, the buzzing will still continue; but there will be found a difference of exactly an octave in the two notes. We ourselves have not tried this with the bee, but have experimented with a blue bottle and one or two other insects, and have found the assertion quite true.

The note of one insect does not always remain at the same pitch, the different sounds of anger and of contentment made by the bees being very familiar to every beekeeper. The former are caused by rapid, nervous motions; the latter, and deeper, by slower vibrations. There is somewhat the same difference between these two expressions of bee-feeling as between the high, querulous crying of a baby, and its low, crowing signs of joy.

The drone has no sting, while the queen and the worker have this organ of defence. In the queen the sting is curved, in the worker it is straight, while in the former it is longer.

The sting is a marvellous structure. The sting itself is in three parts. There is a tube or sheath in which lie two slender and very sharp spears, projecting beyond it when the sting is in use. In the worker these spears are barbed at the end with seven prominent teeth, like the barb of a fish hook, so that they cannot be withdrawn when it pierces any firm substance, and the bee, having stung, flies away not only without its sting, but leaving behind it a portion of the alimentary canal, thus losing its life by the action. In the queen there are but three prominent barbs, and these are very short, and do not prevent the withdrawal of the sting when it has been used, the queen resembling the wasp in her power of stinging more than once. In both the worker and the queen the teeth are successively shorter, as they recede from the point of the weapon, so that the larger ones first enter the point attacked.

The sheath or tube in which are these spears is connected with a poison sack. When the action of stinging takes place the two spears work alternately, like a vertical saw, and the venom escapes from the poison sack, flows through the sheath, and enters the wound made by the spears.

The queen stings much less seldom than the worker, and only after very great provocation, and then with but slight effect. It is believed by some bee-masters that she only stings her equals, *i.e.*, other queens, but cases to the contrary have been recorded, and in one of these she was disabled from further egg laying.

A new feature in the relation of sorghum manufactures *v.* bee culture has come to light in this vicinity (Clinton, Indiana). A farmer living five miles west of here has 40 or 50 colonies of bees. A neighbour living close by engaged in manufacturing sorghum molasses; the bees swarmed around in such numbers as to compel the manufacturer to desist and go away. The bees then made a raid on the slush-hole, where the skimmings were thrown, and filled themselves to repletion, until they died there in such quantities as to cover the slush to the depth of 2½ or 3 inches, and lay dead and sick all over the yard near the furnace. Has the like occurred before, and what is the chemical or poisonous effect of the syrup on the bees?—H. A. WHITE in the *American Bee Journal*.

FOREIGN NOTES.

AGE OF BEES.

NOTHING in the bee business has given us more pleasure than experimenting to ascertain the different ages of bees and the different offices they perform at certain ages, when in a normal condition. When these conditions are not complied with the colony is thrown out of balance, and then it is that bees will perform nearly every office of the hive at nearly every age, even to laying eggs, which office is usually restricted to the queen. In these experiments we have found that queens reared under the swarming impulse attain the average age of four years, even under the forcing process of spreading the brood. We had one which lived to be nearly six years old, laying prolifically till within about three months of her supercedure.

The worker-bee rarely attains to a longer life than forty-five days during the months of June, July, August, and September; while those hatched in September live till the next May, if not injured by our winters. The life of the drone is about the same as that of the worker under favourable conditions, but a very precarious life he lives; for, if a scarcity of honey prevails, and the hives are not fed by the apiarist, the drones are unmercifully driven from the hives or killed by the workers. Friend Salisbury tells us that the drone does not live one-half the length of time the worker does, and cites as proof his experiments with a nucleus. Does not Friend Salisbury know that drones have the privilege of entering, unmolested, any hive where their own drones are allowed to remain; and that, if they are driven from one hive, they are allowed to enter another that retains its drones? Such is our experience. A nucleus having a queen just fertilised has no more need of drones, and persecutes them till they leave; or, if they persist in staying, kills them. With an isolated hive, our position, that drones live about forty-five days during the worker season, can be proven. That drones live over the winter we have proved by twice having our hives so plentifully filled with honey as to have drones flying every fine day during the fall and winter, the excess of honey causing the bees to allow them to live as long as life held out. It was really amusing to hear their merry drum from many hives during February and March. As the pleasant days of April came on they gradually grew less and less, till all were gone about the middle of that month.—G. M. DOOLITTLE. *Gleanings in Bee Culture*.

CALIFORNIA AS A BEEKEEPING STATE.

California is probably the best and the worst place in the world for the average beekeeper. There is no reliability about the season, and there are no two seasons alike. In a good season fabulous amounts of honey are obtained, and the increase in numbers is also fabulous, especially to the eastern beekeeper. A good, prolific queen commences breeding up to her full capacity by the 1st of February, and continues up to the 1st of November. In favourable localities there is a comparative rest or dormant season during three months in the year. In a good season and locality extracting commences in March (that is, providing the hives have been left full of honey, as they should be) and continues up to September.

Everyone succeeds in a good season; all get excited on the question, and everybody wants to go into the business. Parties without the least practical experience purchase an apiary on time; then purchase hives, cans, paint, &c., all on time, and agree to pay with their first honey. The honey does not come, and the lumber dealer, hive manufacturer, hardware merchant, and, in fact, the grocery man, dry-goods dealer, &c., all see financial ruin staring them in the face. Now, providing the season proves to be a good one, the honey is rushed into the market and sold at forced sale, large quantities of it being in an unripe condition; so it ferments, bursts the cans, and helps to ruin the market for a genuine article. As there is no winter to kill off worthless stocks, everything that has been in it is kept, and many an apiary that counts its 300 stocks does not contain 100 good stocks in working order.

Still, I can see that beekeeping even in California can be carried on with profit and success. It needs some capital and considerable good judgment, as well as practical experience. Good, strong stocks kept in a proper condition are self-sustaining, even in a poor season; and in a good season, with proper management, the profits are large. But here let me say that even in California strong stocks are the sheet anchor of successful beekeeping. Understand that I am not writing for the benefit of old California beekeepers,

but for eastern beekeepers who have an eye on California as a beekeeping State.

Bees kept in the valley, where they have had access to large fields of mustard, have stored a surplus; but the quality is not first best. The mountain honey is probably not surpassed in the whole world for its excellent quality; but there is no surplus this season, not even enough to supply the beekeeper's own table. If we have any honey for use we have to send to San Francisco and purchase at double the cost we sold for, which is not just as it should be. The drawbacks to beekeeping are bad seasons, fires burning over the bee range, and foul brood; for foul brood has committed great ravages in some parts of Southern California. I have not had the pleasure of seeing anything of the kind yet. I understand that in Los Angeles Co. it has been quite a scourge. It was introduced into this county by feeding honey from Los Angeles Co. Still, I think by a persistent effort it can be eradicated entirely, as it is only in one or two apiaries at present in this county.

About the middle of June we had a hot time of it. The thermometer went up to 110 in the shade, and the bees began to leave their hives and cluster on the trees in the vicinity of the apiary. We saw clusters from the size of a hen's eggs up to a fair sized swarm. At first I began hiving, but found that they would not hive worth a cent; so I let them have their own way, and, in the cool of the evening, they would go back. Nearly every cluster contained a queen. I caged several, and introduced them to queenless stocks, and the remainder found their way back to their respective hives. The heated term lasted five days, and every day they repeated the same process. Quite a quantity of comb melted down in spite of all the ventilation I could give. Only one full stock was entirely destroyed by melting. Still, I can see that if the hives had been full of honey and brood at the time we must have met with quite a loss in spite of all that could have been done, as the bottom boards were not nailed fast to the hive.

Bees have a fashion of clustering with a virgin queen, perhaps on her wedding flight. They seem to gather from all parts of the apiary (mostly young bees and drones) until they form a decent sized swarm. At first I used to hurry up and hive them; but I soon found out that they did not amount to a row of pins, as they would all scatter away within twenty-four hours. In fact, bees cut up a great many miles in California that we never saw in the East.—E. GALLUP. *Ibid.*

(I have seen something of this same swarming out on account of excessive heat in my green-house experiments. During such a time the loose bottom boards of the Simplicity hives prove a great convenience.—EDITOR, *Gleanings*).

DOOLITTLE'S REPORT FOR 1879.

MR. EDITOR,—Thinking the readers of *Gleanings* would, perhaps, like to hear how we are making beekeeping pay, we send you our report for 1879. We shared the fate of many others last winter and spring in losing quite a number of stocks of bees, and many more were so weak as to compel us to unite them to give us any chance of success. This, with the sale of a few stocks which we promised during the winter, left us only sixty to commence the season with, which opened rather later than usual. Bees did not obtain pollen plentifully till about May 1st, while there was scarcely any honey gathered until the 1st of June. At this time apple yielded quite plentifully, sufficient to last the bees over the period of scarcity we always have between apple bloom and white clover. White clover opened June 15th, and only yielded honey enough to keep the bees rearing brood plentifully while it was in blossom. Basswood opened about July 12th, and yielded a steady flow of honey (although the yield at no time was great) until August 1st. Buckwheat yielded no more than the bees consumed, and so, take it altogether, the season has been an unfavourable one for surplus honey. However, we have obtained in box honey 2,909lb., and 572lb. of extracted honey, making 3,481lb in all, or 58lb. per stock as an average yield. This is the lightest yield we have had during seven years, with the exception of 1876, when our average yield per colony was but 50lb. We contracted all our honey this season early in August, at 15c. for box honey, and 10c. for extracted. We shall go into winter quarters with 100 colonies.

Perhaps it may be interesting to your readers to know how our report stands for the past seven years, for it is only by a number of years' experience in any business that a true result as regards the profit or loss can be obtained. Our average yield for each stock in the spring in 1873 was 80lb., in 1874 a fraction of a pound less than 100lb., in 1875 a little over 106lb., in 1876 it was 50lb., in 1877 a little less than 167lb., in 1878 just 71lb., and in 1879, the

present season, 58lb., making an average yield for the past seven years, or at little over 90lb., per stock, seven-twelfths of which was box money. By looking over our diary we ascertain that this honey has been sold at an average price of 21½c. per lb., the highest price (28½c.) being obtained in 1874, and the lowest (10½c.) in 1878.

From past experience we believe a thoroughly practical man can do all the work required to be done with 100 stocks of bees, and according to the above figures he would obtain, for an average term of years, 9,000lb. of honey annually, which, at 21½c. per lb. would bring him in a yearly income of 1,912 dols. 50c. Although the average yield per colony for the next seven years to come may be increased, yet the price during that time is likely to be much lower, as the high prices caused by the war are passed, and, unless we have some unforeseen event to raise the price of honey, it will probably never bring 28c. per lb. again. Still, with a much lower price for honey than that averaged for the last seven years, beekeeping ranks favourably with almost any pursuit.—G. M. DOOLITTLE. *Ibid.*

LOTS OF BEES AND CHAFF CUSHIONS.

In the autumn of 1878 I commenced preparing my bees for winter in October. My hives are of such shape that I can take out four or five frames half way around, and then put a chaff cushion on each side of them. I not only put a chaff cushion on each side, but I put on an upper storey, and put a thick chaff pillow on top of the frames, and then banked sawdust around the hives until it reached half way to the top of the lower storey. Before the bees were packed, however, they were made very strong by uniting nucleus and doubling up swarms. I have taken bees that were "straggling round" on 22 frames and crowded them on to six frames. The last ones to enter had to use their "elbows" pretty freely to get in; but they did it. I tell you one who has never tried it will be astonished to see in how small space a large swarm of bees can be packed. By the way, I think that about as good protection as bees can have is *bees*. The above method of wintering bees seems to answer very well, but it requires too much "fussing and bother," and costs too much for cushions: so I am going to give the chaff hives a trial the coming winter.—*Ibid.*

REPORT FROM AN APIARY RUN BY HIRED LABOUR.

As but few apiaries are run by hired labour, I thought, perhaps, you might like the report of one managed mainly for extracted honey this season. The yield is only moderate; the linn season was short and slow. We have 27 bls. (about 10,000 lbs.) clover and linn honey. We use oak barrels, made for two purposes, which do not leak and are not waxed. Our May count of bees was 65 colonies. We now have 115 in fine condition for buckwheat. We use in our apiary 250 regular hives, full of regular combs, and about 75 hives containing no combs, but in all other respects like the others. The empty hives are set in the bottom wards of each strong colony, and the hive, or hives, containing the bees set over or on them. The hives of empty combs are added at the top from time to time, as the bees and season require.

All the work is done by a hired man. Nearly all the honey is capped before it is considered suitable to extract, or is extracted. The uncapping is done with a Bingham and Hetherington uncapping knife, and the bees are controlled with two large Bingham smokers, one of which is usually in use.—*Ibid.*

HONEY VINEGAR.

In some recent number of *Gleanings* inquiry was made as to the amount of honey needed for vinegar. Our cappings are drained 24 hours, and then put into a whiskey barrel having one head nearly full of spring water, and allowed to stay a few hours to rinse. Then the cappings are squeezed into balls, like snowballs, and laid away. This process is continued till the water used to rinse the caps will float an egg. It is then put into a barrel with but one head, and covered with mosquito netting and loose boards. In about one year it is vinegar in the loftiest sense of the word, better for all purposes than any cider vinegar ever made.—T. F. BINGHAM. *Ibid.*

WHAT IS ROYAL JELLY?

The following is a letter to *Gleanings*:—"I would like very much to know where the bees get the food for the young queen; I mean the white pasty-looking stuff."—JOS. HARRIS.

[It is the partly, or perhaps wholly, digested honey and pollen which the bees have eaten, and which they throw up and put in the cell, sometimes as a dove feeds her young. The food given the young queen is just the same as that given constantly to the young

worker brood as nearly as I can determine. If I am wrong I should be glad to be corrected.—EDITOR of *Gleanings*.] *Ibid*.

TRANSFORMATION BY BEES OF WORKER TO DRONE CELLS.

We have received the following letter from Ch. Dadant, Hamilton, Illinois:—

"I think that no apiarian has more than ourselves (Charles Dadant and Co.) practised the displacement of drone cells by worker cells. We have done this for more than ten years, and on some hundreds of colonies. Well, we have never seen that the bees have transformed into male cells the worker cells that have been introduced.

"We have noticed, however, that we have sometimes been deceived as to the dimensions of the cells, and this is so with M. Matter-Perrin and yourself too, Mr. Editor, when you imagined you had observed a transformation.

"I remember that at first I thought I saw that certain portions of comb, introduced into the centre of, and with other comb in, the box had been transformed. Then I asked myself why these pieces alone, and not those surrounding them, had undergone this change

"When one places in a box a piece of comb of which the cells have been lengthened for the storing of honey, it is most easy to be deceived, and to take large cells for small because of their length. In a comb containing sealed honey it is most difficult, if not impossible, to tell the size of the cells. When the ends of the cells are cut it is still easy to be deceived. If the pieces introduced were composed entirely of virgin wax, in which the bees would not have raised any brood, the transformation would be easy; but one mostly uses comb where the hatched brood have left their cocoons. Be these cocoons never so small, they are not made of wax, and to reconstruct these cells the bees would be obliged to demolish them. Consequently the *débris* of this demolition would be seen. I have never seen them, at least only when I have committed the fault of placing in the hive comb altered by time, or containing pollen or brood in a state of decomposition. In this case the transformation was made by my stupidity.

"Last year we placed in our hives about 150 kilos of comb foundation; we never saw a single cell changed, although our hives had no drone cells, and if M. Matter-Perrin has obtained a different result, that evidently shows that our comb foundations have their cells deeper than those used by M. Matter-Perrin, as you will be able to judge by the sample which I have the honour to send you.

"After my experience it is impossible for me to admit that the bees transform worker to drone cells, and I believe that a more careful study of the question will convince you that I am not mistaken.

"M. Ed. Bertrand, Editor of the *Bulletin*, remarks on the above:—'According to our correspondent, if M. Matter-Perrin and ourselves have imagined that we have found pieces of worker comb transformed to drone cells, it is because we have inserted by mistake drone cells, taking them for worker cells, and may have used comb containing pollen and brood in a state of decomposition.'

"It appears to us difficult to admit these suppositions. In any case the verification should be a matter of cautious care. We have experiments to renew next season.

"As to the transformation of pressed sheets into drone comb, it has been seen by us, and it can still be easily confirmed, but it is very possible indeed that, as M. Dadant supposes, this is because of the imperfection of our sheets, which are very inferior to those sent us by him as samples, not having, like them, the partitions lateral in the cells commenced. This spring the bees in our stronger colonies showed an imperious desire for drone cells, and to lodge, in every conceivable irregularity in the hives, pieces pared away. As to the pressed sheets, sometimes they transform them simply and purely into male comb, while they sometimes graft above on one side (instead of continuing them with female cells) pieces of male comb fastened by string.

"These are the reasons why we come to the conclusion arrived at by M. Matter-Perrin and M. Jeker, that one cannot completely prevent the existence of male cells in a hive, and that the most simple plan is to leave a few of them remaining."—*Bulletin d'Apiculteur*.

A REPLY TO THE FOREGOING.

Although the honourable M. Dadant contests the fact of the transformation by the bees of worker cells to drone cells—a fact which perhaps he has not met with in his experiences—I can never-

theless certify that it exists. I believe it has been already mentioned in the *Bulletin*, but I will bring forward as a proof that a small piece of new worker comb, given to a queenless colony, has been entirely transformed into drone cells after removing the queen and all the other combs.—S. MATTER-PERRIN in *Bulletin d'Apiculteur pour la Suisse Romande*.

EFFECTS OF ETHERISATION ON BEES.

On the 11th August we again employed on two colonies the method of etherising the bees, our object being to give to each a new queen. The first was a very strong colony, and was removed from its usual stand to another, and the bees have not returned to their old location. In the second, which was not moved, the bees refused to accept the queen. On the 20th August the hive had four sealed royal cells. In July, by smoking the bees, we had already given them a queen which was not accepted; hence our reason for etherising to give them another. We could have caged the queen for twenty-four hours, but we wished to know the effect of etherisation in this case. Thus two young queens were sacrificed for this colony. This more than ever confirms what our experience had already taught us, viz., that to succeed in the operation of uniting, the colony without a queen should be always given to one that possesses a queen; or, at least, a change of location should take place. A wise precaution is to remove all the brood.—*Ibid*.

ETHERISATION.

Wishing to unite the queen and workers of a hive to an orphan colony I etherised the latter, and put it in the place of the former. The operation was completely successful—not a single orphan bee returned to its accustomed spot, with the necessary exception of those which were on flight when I removed the hive, and these were very few. This was on the 19th August.

The second day after uniting I found that eggs were laid in the royal cells. To-day (17th September) the queen is still busily laying, for I fed the colony to strengthen it, it having been queenless since the middle of June.

To etherise American hives (in all of which the combs are movable) I employ a box three centimetres high, otherwise of the exact dimensions of the hive to be operated on. It has two glass windows on opposite sides, so that I can observe the moment when the bees begin to fall. The ether being first placed in this box (about thirty grammes on a sponge, protected with zinc) I immediately put the hive above, and raise it when I see the bees fall.

By this means evaporation is more prompt, and the operation presents less danger to the bees.—F. EISENHARDT. *Ibid*.

HOW BEES MARK THEIR LOCATION.

Mr. S. James writes: "As early as the year 1857, while handling some bees, an incident came under my notice that led me to believe that they are gifted with a faculty of knowing the exact direction to fly to reach the hives—a faculty of location, if I may so term it, that we in our own persons are strangers to. Since that time my attention has been directed to the subject, and I am satisfied of its correctness. When we come to carefully think upon the subject it appears as an absolute necessity for those wonderful little creatures to be endowed with; for, being urged on by an intense passion for the accumulation of honey, beyond all possibility of need, we find them flying here and there in all directions, crossing and re-crossing their line of flight, rambling for miles, it may be in its course, before it has a satisfactory load; then it rises, and thinking of home, and making one or more circles in the air, it 'strikes a bee line,' and that course followed leads to the hive for sure. Though a bee may be roughly knocked round in all directions and sent spinning like a top to a great distance, yet, if sufficient strength remains to fly, it will be found on its rising to go through the same preparatory movements, and then start straight for home. It may be carried many miles from home and then released, yet the little creature finds no trouble in striking the bee line that points towards the hive. We see this faculty exhibited by various creatures, strikingly so in migratory birds.

"That they are possessed with sight and hearing I presume few will doubt, yet I do not think they depend much on seeing, even when they are quite near the hive. We may satisfy ourselves of this fact by noticing the crowd of bees returning to the hive in a busy time. Every once and a while one will alight within a very short distance of the entrance, and seems not to be certain that it is right, while a constant string of others that have alighted much further away are rushing past, yet instead of entering with the

others it will take to its wings and rise up and go through its accustomed circular flight, and then make for the hive. I have seen a bee go through this same course a number of times before entering. I have no doubt but that almost all must have seen the same, if they have paid much attention to the subject.

"A good deal has been said about painting the hives various colours, so as to enable bees, and particularly the queens, to know their hives. I am satisfied this is an assumption that will not be verified by fair experiments. It is the *place or situation* of the hive is in that judges them in this matter. If any one wishes to satisfy himself about it let him next spring, when he wishes to obtain queen cells, select the brightest coloured hive in his yard and put by the side of it an empty hive of the opposite colour, and remove two to four frames of brood and bees, and after having arranged them and closed up the hives remove the parent hive 12 or 13 in. to either side and place the new one where it stood. If this is done in the middle of the day, as it should be, by evening he will find most of the gathering bees in the new hive. Reversing the hives next day will change things again, and by a little proper management he can regulate the division of the working force almost as he wishes."—*American Bee Journal*.

WHAT IS THE BEST MODE OF SPRINGING BEES?

J. H. Mellinger's method was to feed them strongly until apple blossom time, or until the flowers come, by which time they would be in a good condition and throw good swarms.

J. G. Martin thus gives his method of preparing colonies for their spring and summer work. It is of great importance to have our bees strong in the spring before the honey harvest. But how shall we get them and the hive filled with brood so early? My plan is, as soon as spring opens and the bees begin to gather pollen to examine every colony by lifting the frames out, and, if it is weak, shut the bees to one side of the hive with a close-fitting division board, on as many combs as they can cover, so as to keep up the heat necessary for brood-rearing.

If the colony is very weak, I take all the combs out but two, and if it is so weak that the bees cannot cover two combs, then I unite it with another colony. As soon as the queen has filled these combs with eggs I spread them apart and insert an empty comb between those with brood. In two or three days this comb will be filled also with eggs, and so I keep on inserting empty combs as fast as the queen fills them with eggs, and always in the middle of the brood nest, till it is full. The queen will be laying in the centre of the brood nest all the time, instead of on the outside of the cluster, which she seldom will in the cold weather of spring, but when it is warm and the bees are plenty then she will lay anywhere in the hive. As soon as the strongest colonies are full, I take a frame of hatching brood out and put it in a weaker one, and then put an empty comb in the stronger one for the queen to fill again, and so I keep on till all are full. Then put on the boxes, so that if they gather honey they must put it in the boxes, the hive below being all taken up with brood. Each box should have a small piece of comb attached to the top for a starter, or, if you have no nice white comb, put in a narrow strip of comb foundation.—*Ibid*.

QUEEN REARING AND THE IMPROVEMENT OF THE HONEY BEE.

Captain W. F. Williams read the following essay at the meeting of the North-Western Ohio Convention, of which he is President:—

The production of honey and wax is the object of the apiarist. Hence we should breed to attain this object. To do this we must improve on those characteristics of the honey bee that will lead us to the end desired. The first essential is prolificness, to enable us to obtain a sufficient number of bees at the time they can be made the most useful. The second, that of industry and ability as honey-gatherers. Third, gentleness for convenience in handling; and, finally, colour of beauty is desired. With the foregoing traits of character in view, I experimented for three years with the native black and the Italian bee. I found the Italian so far superior that I abandoned the blacks entirely. The Italians possess the ability to protect themselves from the ravages of the moth miller, and also to gather honey from the blossoms of the red clover, in which characteristic the blacks are deficient. The last season, with one hundred and fifty colonies of Italians I have had less trouble with moths than formerly with one colony of blacks. In August last my Italians were storing honey from red clover, when the blacks were not gathering enough for daily consumption.

In raising queens I select a strong, healthy colony, especially

strong in young bees, and remove the queen. The next day, or as soon as queen cells begin to develop, I remove all the combs containing eggs or uncapped larvæ. I then select comb containing eggs only from my best colony (usually from imported stock), and place it in this queenless colony prepared as above. I aim to have my young queen hatch out on the fourteenth or fifteenth day. The tenth or twelfth day I divide the colony and prepare as many more colonies by dividing the strong ones as is necessary for the number of queens wanted. The thirteenth or fourteenth day I give to each colony thus prepared a queen cell. I then keep watch of the cells till the queen comes out. If well developed with good wings I mark the date of hatching; if faulty, I destroy her and give the colony another cell, or join it with a weak colony. As soon as my queens come out I select my colonies containing drones with which I desire to make my young queens. I usually put a few selected drones in the same hive with virgin queens. When my young queens are three days old I close the entrances of the hives containing selected drones and those containing virgin queens, to prevent egress of drones or queens. I generally do this about eleven o'clock a.m., or before the drones take their daily flight, which usually occurs about twelve to one p.m. Watch carefully their return, and when they are all in let out your virgin queens, giving them a few minutes' time to make observations regarding locality. Then release your drones; do this daily until all are fertilised. If the weather is favourable, and your bees properly stimulated, you will seldom fail in having your queens fertilised by the fifth day. The points gained in the process are—First, by selecting eggs from choice colonies your bees have the full time allotted for the perfect development of the queen bee. Second, by giving stimulating food during their virginity you have the most perfect development in growth. Third, you select your drones from good blood with the same care that you can select the blood of the queen, which is equally or more important. In general, from the female we look for form, gentleness, activity, and colour; from the male, energy, industry, ability, and longevity. In conclusion, I will give the results of a few experiments in 1875 with one colony of Italians, and 13 colonies of blacks in the same yard, with 15 blacks within about 50 rods south, and eight or 10 more in a radius of half a mile. I reared seven Italian queens, and by adopting the above process I had four of the seven purely mated. This was my first effort, and might say it was a "happen so." At another trial, where the Italians and blacks were about equal in numbers with seven queens, all were purely mated.

From past experience and observation I am confident that fully three-fourths of our queens may be mated with selected drones by a little painstaking.—*Ibid*.

HOPE FOR THE DEPRESSED.

Is Nature consistent? Does she cause her works to harmonise? As far as those things which concern bees are considered we cannot answer in the affirmative. This year Nature has caused great quantities of bees to be hatched only to condemn them to die of hunger; so much so that, at the present time, if man does not come to the succour of the bees, the species will entirely disappear from certain regions. Man, then, is the being who, when he is intelligent and enlightened, can harmonise the diverse creations of Nature. From this we should learn that we ought to feed our bees, making them advances which will in all probability be largely reimbursed next season; for if Nature is not consistent she is at least reparative.

Taking the statistics of the past we find that always after a year or two of misfortune and disaster comes a third which greatly repairs the results of the previous evils, and which gives us more honey in one season than three average years put together. We must remember how the disastrous years 1829 and 1860 were followed by the extraordinarily good ones of 1830 and 1861. In our reckoning we shall always remember that in 1861 a set of hives bought at 25 francs a-piece brought us in 60 francs net profit per colony.—*L'Apiculteur*.

DO WORKERS EVER LAY DRONE EGGS?

A gentleman writing to M. Hamet says: "As it was generally recognised that males were born from unfecundated eggs, I admitted that and supposed that the workers could easily lay these eggs, and that the queen did not trouble herself about them. I have already told you of my determination to verify the thing. I agreed with some of my colleagues to make experiments, and to shut up the queen immediately after she had been very busy lay-

ing, to ascertain whether it was really she who laid drone eggs, or whether it was done by the workers."

The writer promises to give the results of his several experiments. This is his account of the first:—

"On the 22nd of June I took a queen from a hive and introduced her to an observation-box furnished with one comb of large cells and one of small cells. I then placed this box on the hive from which I had taken the queen, after having put back the bees into the latter. Soon several workers had communicated with the queen, and passed into the box. The next day a great number of workers were in the box, and about a twentieth part of them surrounded the queen, the greater part of these attacking her abdomen with their claws and mandibles, not ceasing to pursue her, and allowing her no rest. On the 26th of June (the fourth day) the bees still continued to pursue the queen; they had done no work yet, not even to mend the combs; there were no eggs laid there. Yet this queen was very fertile, for the hive contained much brood, and at the very instant when I introduced her to the box she let several eggs fall. Twice since she found herself surrounded by the bees did I see eggs emerge from the end of the abdomen which were seized by the workers. But as these workers disappeared in the group I was not able to see what they did with them. Seeing that the queen did not lay in the combs in the box, and that the eggs were not raised there by the bees, I thought the cause must be the presence of so great a quantity of brood in the hive. Then I transferred the bees to a hive containing some beautiful empty comb, and I placed my observation-box beneath it, with queen inside the box."

So ends experience No. 1, and we are anxious to read the other accounts promised in future numbers of *L'Apiculteur*.—*Ibid.*

BEEES IN AUSTRALIA.

The bees introduced into Australia have multiplied rapidly and largely. They labour there almost all the year round. The honey produced in the spring remains liquid; the winter honey is thick and of a doughy consistence at first, but speedily crystallises. The quality of the honey is excellent, though differing according to the location of the apiary and the kind of pasturage. That gathered in the southern districts of the country is extolled as the best.—*Exchange, U.S.*

HINTS ON WINTERING BEES.

In view of the serious losses by beekeepers during the past winter, and its two or three predecessors of the past ten years, there is scarce any subject so worthy of attention and study and so sure to gain it as the one at the head of this article. If we may judge by the past, we may expect these trying seasons about once in three years. Notwithstanding this probability, I feel certain that the wise and painstaking apiarist has nothing to fear; more than this, I believe these trying winters will be to his advantage, on the principle of the "survival of the fittest." The careless, ignorant beekeepers, with their unmarketable honey, will be weeded out, and he will be spared competition. This is a double advantage, as it is the ill-prepared honey of these ignorant, slovenly beekeepers that most depreciate prices.

It seems more and more certain that wise forethought and corresponding action is going to bridge over these dreaded disasters. I know of no one in this vicinity who knew how, and practised what he knew, that suffered loss the past winter. I know a few who knew, but were too negligent to act, hoping that good fortune would make it unnecessary, who lost heavily. I know many more who neither knew nor practised, who lost all or nearly all.

That we may the better fortify against the dangers that are sure to confront us sooner or later, and may any winter, let us learn what these evils are.

Experience proves very clearly that very severe cold, even for two or three weeks, is dangerous to bees. This may work evil in two ways: The bees feel the chill, essay to move, and drop from the cluster and perish. With more activity they eat more, and thus may use up the honey where the cluster is formed, and the surrounding honey being chilled and inaccessible, the bees actually starve. If the cold be long continued the danger is greatly augmented. Extremes of heat and cold are also detrimental, especially if the bees are prevented from flying. With either heat or cold the bees become uneasy, eat more, and unless they can fly become diseased and die.

The sorrowful experience of beekeepers near by cider mills and sorghum presses clearly demonstrates the importance of good food. This is doubly important during winters of long-continued

cold, when bees are unable to fly for long periods. It is often noticed that bees about cider mills are healthy in autumn. It is only when the cold of winter shuts them indoors that they succumb to dysentery.

The worker bees after a few weeks of active labour wear out and die. Such bees are ill-prepared to brave the dangers of a trying winter. If the bees breed actively till October, there will be no danger from this source.

Excessive moisture in and about the hive is thought to be a source of danger to the bees. This seems more than probable, as dampness and warm the always promote the development of fungus growths, which as evils are more insidious because they are often invisible without the microscope. These may not only affect the bee through the air which it consumes, but also by contaminating its food.

To secure a uniform temperature of about 40 deg. Fahrenheit—it may safely vary 5 deg. either way from this—we must in some way protect our bees. We may do this by using a dry, dark, well-ventilated cellar, in which they must be placed before severe cold weather commences—about middle of November in this latitude, and till the flowers come, about April 1st here at Lansing, Michigan. To secure good ventilation a pipe should extend from near the bottom of the cellar and connect with a stove pipe or chimney above. Another pipe should connect the cellar with the outside, but should run for 20ft. under the ground, so that the air as it enters the cellar may be warmed by the natural heat of the earth. The depth of this pipe should be about 5ft. It may be made of tile. Of course the cellar should be perfectly drained.

Houses built above ground may do as well as cellars, if they are so made as certainly to secure a uniform temperature. Setting these in a side hill will aid in this respect. Such houses would need no drainage, but should be ventilated the same as the cellar, except that it may be difficult to connect the pipe for the escape of foul air with a stove pipe or chimney above. In either of the above cases do not remove the bees during the entire winter if still quiet. If they make a loud noise along in February or March, or soil the entrance to the hives, then they should be carried out, the first warm day, for a flight, and returned to the cellar or house at night. With proper care this will seldom be necessary.

We may also secure uniformity of temperature by surrounding each hive, or two or three hives set close together, by a box, which shall leave a space of a foot between it and the hives. This space may be crowded full of fine straw or chaff, and all kept dry by a cover. A tunnel five or six inches square, placed at the entrance, would permit the bees to fly during protracted warmth in winter, and thus be of great service. This box should remain about the bees till May in the colder parts of the country. Hives with double walls, filled in with chaff, will serve the same purpose. These, however, are large and awkward in summer. By tacking a cloth to the bottom of the upper story or cover of the hive, this latter may be filled with chaff, which will not only aid in protecting against cold, but will serve as an excellent absorbent just above the bees.

When honey is good and sufficiently evaporated, bees always seal the cells. The finding of uncapped honey in October, therefore, is presumptive proof that it is not good. All such should be extracted. Only capped honey should be left for winter. If there is not enough of this—30 pounds—then feed, not glucose, or grape sugar, or poor sugar of any kind, but either good thick honey extracted early in the season, or good thick syrup made of granulated sugar. This food should be in a space not to exceed one cubic foot, confined by a division board, so that the bees may have to keep only the necessary space up to the required temperature. This is very important during winters of long continued cold, as the bees are unable to break and re-form the cluster, and so must have the honey concentrated in a few frames and not scattered through many; else they will be unable to reach it and will starve, though there be plenty of honey in the hive.

To secure this requisite, the bees must be kept breeding till October. They will do this if kept storing and given room. If there are no nectar-secreting flowers in August and September, the bees can gather no honey, and the brood rearing will cease. In such cases we must feed a little honey daily. One-half pound is enough. Again, if the fall yield of honey is great, the bees may store so fast as to fill all the cells and leave no room for the queen to lay. Such cases in August and September are very common here. Then we have only to use the extractor and give more room by adding sections and boxes.

I have already spoken of dry cellars, and absorbents above the

bees. Could our hives be so constructed as to secure a good absorbing surface entirely around the brood chamber, it would doubtless be an advantage.

Keep the bees breeding till October feeding and abstracting if necessary. Early in October I would look at the bees, give the proper amount of good honey, extract or remove all that is uncapped, contract the chamber, and put on the chaff. By the middle or last of November I would surround with boxes or put in cellar or house. In February or March I would examine frequently, and if I found any bees in any hive uneasy, I would give them a fly by removing those in cellar or house to summer stands. Early in April I would remove permanently to summer stands. In April I would keep brood chamber so confined, by use of division board, as to keep all the combs covered with bees, and by exchanging combs of capped brood, build up my weak colonies, so that by the middle of May all should be equally strong. By this course I have ever been spared loss by spring dwindling.—Professor A. J. Cook in the *American Farmer's Review*.

HONEY IN ENGLAND.

H. K. AND F. B. THURBER AND Co.

Now that the honey harvests are about closing and the minds of producers naturally enough turn to the problem of how and where it will be best to sell their crops, we thought a few lines from us would be of seasonable interest to them, particularly if we touch upon the question of a foreign outlet.

As every one now pretty generally understands, the season in the United Kingdom has been singularly disastrous for all kinds of crops, and so entirely fatal have the cold wet rains been to the honey yield, that not enough honey could be collected to make a respectable show at any of the fairs this fall. In France the honey crop is also short, but in the southern part of the Continent, as also in the West Indies and South America, from whence large shipments are made to this country, an average yield is calculated upon. Prior to our general introduction of American honey upon this side, the London, Antwerp, Liverpool, and Hamburg markets were supplied from Chili, Jamaica, and Peru, while *connoisseurs* in England were supplied from Narbonne, in France. Last year, however, the overflowing crop of America found its way direct from San Francisco and New York to the English and German ports in such quantities that the West India and South American honey has not met with its usual ready sale. When we first saw as much as 2,500 barrels of Chilian honey advertised for sale in Liverpool, we were surprised, and sought out the parcel with a view of obtaining all the information we could upon the manner of its sale. In Liverpool, as in all other European ports, the docks are regarded as their greatest and most necessary public improvements, and to defray the expense of keeping them in order every parcel of goods unloaded is taxed for "dock and town dues" a certain sum per ton. Along the sides of these docks are immense warehouses into which the vessels discharge their cargoes. There the honey is submitted to another tax; they charge, for instance, six-pence (12 cents) per barrel for receiving honey, and a six-pence for delivering each barrel into the cart or waggon of the buyer, and one-penny (2 cents) per barrel a-week for all the time it remains unsold. When we reached the dock where the 2,500 barrels were being discharged we found an old man drawing a little sample from each of the barrels, after examining which he would mark the barrel it was drawn from either "X," which denoted white colour, fine flavour, and heavy body, like basswood or white sage:—"1" which designated a coloured honey about like white clover (we would hardly have discriminated between these two grades, but he did); "2" indicated a grade, the quality of which was about like golden rod, "3" was like our buckwheat, and "4" resembles in colour and body Louisiana honey. Each of these marks were piled up separately, and those assorted samples were sent to the broker or auctioneer, who advertised and sold them in one of the commercial sale rooms in Liverpool with the following result:—

Pile	x	40s.	per	112	lbs;	about	8½c.	per	lb.
"	1	38s.	"	"	"	"	8c.	"	"
"	2	35s.	"	"	"	"	7½	"	"
"	3	30s.	"	"	"	"	6½	"	"
"	4	26s.	"	"	"	"	5½	"	"

We have since found this system prevalent in all the European markets, and the prices named have averaged just about the same for the last ten months. The market is rather bare, and we antici-

pate higher prices this fall. The cost of freight for honey in barrels and square five gallon tins from New York to London, including dock and landing charges, equals about half a cent per pound; that is, about one cent per pound less than the freight is from Cherry Valley to New York City. Freight direct from San Francisco to London is 1½ to 1¾ cents less per pound than from San Francisco to New York; while the cost per pound from New Orleans to London is 50 per cent. cheaper than from New Orleans to New York or Chicago. Eight and a half cents per pound in London will net the California honey producer more than 10½c. per pound in New York would.

Extracted honey is liked much better than strained, because it is free from dead bees and filth, and this preference makes American honey better liked. While candied honey is sold in pots and jars, the packers prefer it liquid when they buy it, because they can pour it into the pots and jars and let it congeal there. They never remelt candied honey, because, as they truthfully say, after candied honey has been heated fermentation is more likely to occur. The freight and expense of transporting comb honey from New York to our store in London is about 1½ to 2 cents per pound. According to the "Weights and Measure Act" of this country, we are obliged either to specify exactly the net weight of honey each box contains, or sell them by the dozen boxes; and as a "box of honey" is a box of honey to most buyers on this side, a 30-pound crate brings no more than a 25-pound one. So we urge for this market a uniform size box be used.

The lowest price at which we have sold sound light honey on this side at has been 24s., less 25 per cent., which is about 16 cents per lb. gross weight. The highest, 27s., less 10 per cent. Buckwheat honey in the comb is not in request at any price. The expense attending the sale and distribution of comb honey after its arrival on this side will always be an impediment in its way; still, there will no doubt be a trade in fancy marks at remunerative prices.

Since we embarked in the honey business [we have had many interesting conversations with the most intellectual honey producers in America regarding the comparative cost of producing box or extracted honey. The information thus gleaned, when considered in the light of our observations here in Europe, and the difficulties attending the safe distribution of honey in the comb, prompts us to warmly recommend the great masses of honey producers to work their apiaries for the exclusive production of extracted honey. If the honey industry in America continues to increase at the same ratio it has the past ten or fifteen years, it will be indispensably necessary to seek a market here in London, the great barn for all the earth's harvests. We earnestly hope, for the sake of the best interests of the beekeeping community, you will take time by the forelock and work up a greater interest in the production of extracted honey. Extracted white sage honey and basswood honey will always bring fancy prices on this market.

We will always be most happy to reply to any inquiries your readers may wish to make regarding the European markets.—*American Bee Journal*.

London, England, Sept. 7, 1879.

A LECTURE ON BEES.

THE following lecture was given by Mr. Ollerhead at a meeting of the Wimbledon Gardeners' Association:—

"Amongst the many pursuits that one could be engaged in during leisure moments, few are more interesting or lucrative than the management of bees. To search into the mysteries of the hive, watch the queen or mother bee laying her eggs, her attendants following her, the progress of the larvæ, the formation of cells, particularly the queen's, the storing of honey, and the various other work conducted with such wonderful regularity and discipline, when fully explained cannot fail to interest. On the other hand, the profits accruing from a few hives of bees in a favourable season when properly managed are astonishing. Mr. Pettigrew in his most valuable 'Handy Book on Bees' tell us that his own profits altogether from 1870 to 1874 were upwards of £220, after deducting an annual expenditure of 10s. per hive. It must not, however, be expected that this is realised without a certain percentage of care and trouble. To suppose that simply because you procure a hive of bees and set it on a stand in the garden that your care and outlay is at an end, and that nothing but profit must follow, is quite erroneous. It is true that in favourable seasons the bees

will take care of themselves to a very great extent and gather in stores of honey. Such is not the case in a season like the past, because there has been very little honey or nectar in the flowers, and the excessively wet weather has prevented the bees collecting what little there was to be obtained.

"I am prepared to hear sad news from the bee-keeping community next spring. Depend upon it, only they who have paid unremitting attention to their bees this year will be able to commence next season with advantage. Feeding, feeding, feeding all the year or nearly so has been the principal work in the apiary during the year 1879; in fact I can hardly tell you to what extent I have been feeding the bees unless I look up my memoranda very carefully.

"Last autumn I carefully prepared twenty hives for the winter—viz., four Pettigrew's, three Neighbours' cottage hives, two Stewarton's, five Woodbury's, two Carr-Stewarton's, and four double Neighbours'. The latter were Neighbours' cottage hives—hives with the crown board knocked out, and the super cover attached to the body hives so as to make a good-sized one, as I am persuaded from experience that all Neighbours' small cottage hives are too small, and only adapted for selling small swarms for profit. The whole twenty hives referred to passed through the winter safely and strong except one, a Stewarton, which on being examined early in March was found very weak. This was united to a Neighbour hive close by. The long cold spring was very unfavourable for breeding, and at the end of April the bees were no stronger than they were early in March. This was particularly noticeable in the wooden hives, although the crown boards were removed and the hives well covered up with housemaids' flannel and other warm material. I may also state that bees as a rule in straw skeps work earlier and later than those in wooden hives.

"This year I have had to drive two stocks infested with foul brood, the cause of which I attributed to the vicissitudes of temperature. A few warm days caused the bees to expand and cover the combs. Stimulated by a little slow feeding the queens exercised their laying powers; the eggs were set and larvae were hatched when the cold wet weather caused them to huddle up into closer quarters, leaving portions of the brood uncovered, causing a chill, followed by death, putrefaction, and foul brood. We are told that salicylic acid if properly applied is a safe and certain cure, but I think the best cure is to drive the bees into a clean empty hive, feed them for a couple of days, drive again and unite to a healthy stock, and scald the hive they were in two days in readiness for further use. I have generally had my hives free from foul brood by keeping clean combs in them, and by not keeping old stocks too long. I have many times cut out small portions of infected comb, and thus prevented further spread of disease. I never wintered such stocks, but united them to others in the autumn or fed them with sugar.

"The bees in this neighbourhood could not obtain food sufficient to keep them in existence this year until the limes came into flower. Then there was a glut for a few days; and on July 31st, the limes being over or nearly so, we took them a few miles out to the heather; but the continual wet weather prevented them gathering what little nectar there was in the flowers, and after waiting patiently for a favourable turn in the weather, but without realising it, we fetched them home September the 9th much lighter than when we took them away. We examined them thoroughly, and found a very little brood in the straw skeps and none at all in the wooden hives.

"Our next task was to unite some of the stocks to swarms, destroy the old queens, and prepare them for winter by liberal feeding until each stock has sufficient food to last them until next March. Thus we have prepared and reduced the number of our hives to fifteen. I may also here state that I fed the bees very slowly until nearly the middle of this month so as to secure a late hatch of bees, as on these depend the strength of the hives next year. As I must remind you that it has been ascertained that no worker bee lives longer than five months at any period of the year, and in the height of the busy season their existence is much shorter, also that during the winter season little or no breeding in the hive is going on to keep up the population. Thus the old bees keep dying off, and there is none hatching out to take their places, and this is why a hive strong in bees in autumn becomes much reduced by spring. In fact I know of several instances where hives strong in bees last autumn passed through the winter safely, but the bees died in April. This I attribute to the want of slow feeding last autumn to secure a late hatch of bees, and also to the want of feeding early in March and onwards, keeping the hives well

wrapped up and cosy to secure early brood in spring. If the queen finds no food coming into the hive she will cease to lay, and the workers finding a famine imminent will cast the young out of their cells. All beekeepers that wish to prosper will not fail to pay special attention to this important point.

"Thus you see the art of bee-keeping does not merely consist of buying a hive of bees and putting them in the garden to look after themselves, but there is care, attention, and a little knowledge required if you wish to succeed. There is much superstition existing relative to bees. Some say they dare not go near them, as they would be sure to get stung. Well, I would not advise any timid person to approach a hive without a veil, and then under proper tuition the most timid one may overcome and do anything they wish with their bees. Other people will tell you if the bee-master dies, and you do not tell the bees or rap the hive and put a black rag on it, the bees will all die; but this is ridiculous. The fact is the bees die from neglect, in some instances from want of judicious feeding, while in others the bees take care of themselves till foul brood seizes a colony. This is pillaged by its neighbour hives. The disease is spread until they are all contaminated, and ultimately succumb to the pestilence, and then the would-be bee prophets tell you, 'Oh! I told you would lose them,' &c.

"If you wish to enter into beekeeping and know nothing about them, consult a friend or neighbour that does, and obtain his advice and assistance in buying a hive. The price will, of course, depend on circumstances, such as the time of year and the kind of hive the bees are in, and also the locality. You could hardly expect to obtain a hive in Regent-street at the same price as you would pay on Salisbury Plains or the wilds of Dartmoor. If you ask what kind of bees you should buy, I answer, blacks of course. After many careful trials in testing the superiority of the Ligurian over the black bees, I have come to the conclusion that Ligurians are fancy bees at a fancy price. My last experiment was made several years ago, which resulted as follows:—Two swarms as near 7lb. each as possible were placed into two hives exactly the same make and about five yards from each other. They were fed in exactly the same proportions and treated alike in every way until the end of the following season, when the stock hives with their swarms were weighed. Contents of Ligurian stock hive 71lb., first swarm 70lb., second swarm 21lb., total 162lb. Contents of black bees' stock hive 59lb., first swarm 73lb., second swarm 32lb., total 164lb.; credit to the black bees 2lb. Some people will tell you that the Ligurians work earlier and later, wet as well as dry weather, are more prolific, and have a host of other good properties. Well, such may be the case; but I, for one, so far have failed to realise them. I must confess that I like to see the Ligurians in an apiary, and paid 11s. for one last June, but it was not because I expected to realise any advantage from her; it was merely for the sake of having a pure one in the apiary.

"We now come to the question of hives. A great diversity of opinion exists as to which is the best hive to use. The old straw skep, the 20-in. Pettigrew, the cottage Neighbour, the Woodbury, and Carr-Stewarton, are each good in their way, but to my mind the best hive for quantity of honey, either in the comb or in supers, is the Pettigrew. The hive itself has a capacity for a prodigious quantity of honey, while sectional or other supers may be piled on the crown to any extent desirable. Neighbours' Crystal Palace straw skep is also a capital hive. Of the wooden hives in use none please me so well as the old Woodbury; from it you can obtain honey in the frames or in side or top supers. These three are the only hives I would recommend to anyone; but all apiarists as a rule have their pet hives, particularly the manufacturers. I was highly amused when visiting the show at Kilburn by a vendor offering to show me the only hive that had produced British honey in the show. Now, mind, it was the hive that had produced it. I of course availed myself of the opportunity, and saw what I considered two Woodburys piled one on the other, with excluder zinc for side and top supers, and a few other complications of the manufacturer completed the wonderful hive, for which the modest sum of two guineas was asked. The zinc had round holes in it, and I inquired if he never found any bees die inside the zinc. 'Oh, no!' was the reply. I told him my experience was the reverse. He attributed it to the way it was put on; but I can only say they will die, put it on how you may, and the living bees cannot carry the dead through it. I fully expected he had Ligurian bees, but it turned out he had fifty hives of black bees. Having satisfied him that the bees, not the hive, gathered the honey, I inquired what they gathered it off. 'Forty acres of lucerne,' was the reply; 'but mind you,' says he, 'its no use unless you put two swarms in one hive, fill your

hive with bees, and then you will obtain honey.' This reminds me of a man who boasted to me of a wonderful super of honey he took last year. 'Was this the produce of one swarm?' 'One hive,' says he. 'But were they the offspring or swarm of one legitimate hive or stock of bees?' 'Ah, well, no, I cannot say that.' 'Tell me the truth, now; how many swarms did you put together?' 'Well, I wanted to do something grand, and I don't intend to tell everybody, but I put seven swarms together.' 'Oh, well, if you cut up the super into seven it is not much after all.' So you see it is not they that cry the loudest that have the most to sell.

"There is no doubt that bees will do well in almost any hive provided they are properly managed, but the fewer obstructions you have in a hive the better it is, to my way of thinking. We have heard of the wonderful feats of the 'Renfrewshire Beekeeper' with his Stewarton hives, but I can only say they are no better than any other; in fact, I do not like them so well as a Woodbury. I have three sets of boxes and supers now never been used, and will be very pleased to sell them for what they cost for making—not charging for the materials. I have visited every show of the British Beekeepers' Association, and have so far failed to find any hives better adapted for the profitable management of bees than the Pettigrew, Crystal Palace straw skep, and the common Woodbury, and, I think, it will be a long time before we find better in the market. I took 110 lbs. of honey out of a Pettigrew three years ago, and 97 lbs. out of another, which was considerably more than the returns from any of the other hives on the same ground and under the same treatment.

One word now as to supers. Doubtless the worst kind of super for bees is a glass one, and the one that they take to most freely is made of straw. Supers are made in a great variety of shapes and forms. The best side box, super, or section that has yet come under my notice is one made in America, and was exhibited by Mr. Newman, of Chicago, at Kilburn and South Kensington this year. They are all in one piece, and so contrived that a bit of guide can be run in them and then folded so as to form a section about four inches square by three inches in width, the whole held together by one small French nail, a bit of gummed paper, glue, or anything of the kind, and are admirably adapted for working in frame hives. Another good form of section is Abbott's; there is some filled with honey, others empty. These may be used either inside the hive or as supers on the top, with bits of tin to keep them straight. These are very good supers in their way. I have used many of them. There is also Neighbours' Crystal Palace prize divisional super, but I do not like it at all. The bees do not always build straight in them, so that when they are cut through you break the crooked combs and so make the honey run or "bleed," as you will see in this super before you. The comb is not straight; it was put on the hive with guides just as received from Neighbours, of Holborn.

CURES FOR STINGING.

A FEW of our correspondents tell us that they are very desirous of commencing beekeeping, but have fears that their wives and children, and in some cases their neighbours—we might almost add "their sisters and their cousins and their aunts"—will run a great risk of being stung.

We can only repeat that bees, knowing that to sting means the sacrifice of their life, are very unwilling to act on the offensive, and that cases of those *not deserving it* being stung are few. Of course accidents *will* happen now and again, either through ignorance or carelessness. If a bee settles on you, leave it alone, and allow it to remain until it has had enough of you. Or if you are in a greater hurry than the bee, blow it gently off, and it will not hurt you.

When one bee, however, stings, others that are near often rush to help it in its attacks. Like some people in a street quarrel, they do not wait to know the cause of the uproar, but join the fight at once, forgetting that "the end of a feast is better than the beginning of a fray."

When a bee stings it leaves venom in the wound, and the pungent smell of this venom attracts other bees, and angers them. It is better, therefore, when you are stung to retire at once from the contest, and, if any building is at hand, enter it, for bees will seldom follow. The sting should be removed as quickly as possible, for the sooner it is extracted the less venom

is ejected; and, consequently, less inflammation induced. One of the best cures, because generally most ready at hand, is vinegar, which should be rubbed gently as soon as can be over the place. Ammonia is a still better remedy. An American paper gave the following instructions:—

"The only *positive* and *immediate* cure for a bee-sting that I ever heard of, that may be depended on in all cases, is tobacco. This remedy was recommended to me as an infallible cure; yet I had but little faith in it. Still, I tried it, and, as I supposed, properly, and found little or no benefit from its use. I reported its failure to cure in my own case to an informant, and he stated that I had not applied it thoroughly, as I ought to have done; that he was certain it would be an effectual cure, never having known it to fail in a single instance when properly applied. The next time I got stung I applied the tobacco, as directed, and found it to cure like a charm. The manner of applying it is as follows:—Take ordinary fine-cut smoking or chewing tobacco, and lay a pinch of it in the hollow of your hand and moisten it, and work it over until the juice appears quite dark-coloured. Then apply it to the part stung, rubbing in the juice, with the tobacco between your fingers and thumb, as with a sponge. As fast as the tobacco becomes dry, add a little moisture and continue to rub, and press out the juice upon the inflamed spot during five or ten minutes, and if applied soon after being stung it will cure in every case. Before I tried it I was frequently laid up with swollen eyes and limbs for days. *Now it is amusing to get stung!*"

In case horses are badly stung, as sometimes happens, they should be taken as speedily as possible into a barn; then wash the horses in soda water, and cover with wet blankets.

Professor Cook, talking of stings, says: "It is often stated that sweaty horses and people are obnoxious to the bees, and hence almost sure targets for their barbed arrows. In warm weather I perspire most profusely, yet am scarcely ever stung, since I have learned to control my nerves. I once kept my bees in the front yard; they looked beautiful on the green lawn, within two rods of a main thoroughfare, and not infrequently let my horse—covered with sweat upon my return from a drive—crop the grass while cooling off, right in the same yard. Of course there was some danger, but I never knew my horse to get stung. Why, then, the theory? May not the frequent stings be consequent upon the warm, nervous condition of the individual? The man is more ready to strike and jerk, the horse to stamp and switch. The swishing of the horse's tail, like the whisker-trap of a full beard, will anger even a good-natured bee. I should dread the motions more than the sweat, though it may be true there is a peculiarity in the odour from either the sensible or insensible perspiration of some persons that angers the bees and provokes the use of their terrible weapons."

The venom affects different people in different ways. With some all the pain and ill-effects are over in a few minutes, while with others who are more than usually susceptible to the poison a sting in any part will cause the eyes to swell to such an extent that sight is prevented. It is a curious though well-recognised fact, however, that the constitution becomes hardened to stinging, and the more often a man is stung the less does the venom affect him. "Many persons, among whom were the noted Klein and Gunther, are at first very susceptible to the poison, but, spurred on by their enthusiasm, they persist, and soon become so inoculated that they experience no serious injury from the stings."

ADVERTISING AS A SCIENCE AND AS A SUCCESS.—Those desiring to advertise to the best advantage should read an article on the above subject included in the contents of "May's British and Irish Press Guide and Advertiser's Dictionary and Handbook." Price One Shilling, or by post 1s 3d. Published by FREDK. L. MAY and Co., Advertising Agents, 159, Piccadilly.—Advt.

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CORRESPONDENCE.

NOTICE TO CORRESPONDENTS.

We make it a rule, and one that we shall adhere to strictly, that all letters for insertion in THE BEEKEEPER must, when published, bear the name and address of the writer. Ours is an independent journal, open to all who wish to call notice to anything new or interesting to the bee-keeping world, and we believe we shall remove a source of constant suspicion and complaint if we firmly follow this regulation. These remarks do not apply to the Notes and Queries department.

While we shall print as much correspondence as possible we do not bind ourselves to publish every letter we receive, and shall feel at liberty to reject those that seem to us devoid of general interest and those which, in our opinion, are likely to lead to quarrelling instead of fair discussion.

We respectfully beg all our readers to have perpetually in view a laudable desire to extend the practice of bee culture in this country, and having this aim before them to send us reports of anything they meet with in their experience that seems to them to have been unnoticed before.

HELP FOR THE INEXPERIENCED.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—Having read your first number with great interest, and the article by "An Old Beekeeper," in which you ask for addresses of those who will return answers to those requiring them, I beg to say I am always ready to answer on receipt of "stamped envelope" fully addressed. I have done this for years, but I must add that those who forget to send the "stamped envelope" must not be surprised if no answer is returned to them. I cannot undertake to give my experience freely and undertake the postage too.—I am, Sir, yours faithfully,

P. E. MARTIN.

Proprietor and Manager Great Hampshire
Bee Farm, King's Somborne, near Stock-
bridge, Hants.

Oct. 27, 1879.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—I read your article in the BEEKEEPER on "The Past Season and Feeding," and I cheerfully respond to your invitation, and will on receipt of "stamped addressed envelope" give the best information I can to all beekeepers who require it. I have had 40 years of beekeeping life, and never but once remember a season so bad for honey getting as that of the present year, and that was in 1860; but the following season (1861) was just as good for our little favourites as the former was bad; therefore I quite agree with you that "according to the law of probabilities such another season as that just past will not be likely to occur again for some considerable time, and I think it well to take particular care of our pets, in the hope that we may next year be favoured with even a better season than that of 1861, and that "honey, money, and wax" may be our reward.* Langstroth says:—"In the spring the prudent beekeeper will no more neglect to feed his destitute colonies than to provide for his own table. A beekeeper whose stocks are allowed to perish after the spring has opened is on a level with the farmer whose cattle are allowed to starve in their stalls, while those who withhold from them the needed aid in seasons when they cannot gather a supply resemble the merchant who burns up his ships if they have made an unprofitable voyage." I therefore hope that no Englishman will "withhold the needed aid" after such a season as the present.—Yours faithfully,

WYATT J. PETTITT.

Apicultural Institute, Dover, Oct. 29, 1879.

[* See the article, under "Foreign Notes," "Hope for the Depressed." M. Hamel, Editor of *L'Apiculture*, has evidently hope of a better season next year.—EDITOR.]

ERRORS IN OUR LAST.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—Allow me to call your attention to an error in page 24, bottom of first column. John "Hall" should be John "Keys," and your quotation of the title is not quite correct: it should be "The Antient Bee Master's Farewell," and I feel sure you will excuse my mentioning it, as such like errors tell as to the ability of the publication with those who have made the science their study for years. Your paragraph as to Mr. Neighbour's library is also a very wide one, and may, perhaps, be not quite fact.—Yours ruly,

J. G. DESBOROUGH.

12, St. Peter's Hill, Stamford, Nov. 1, 1879.

[The passage referred to was taken from Professor Cook's

"Manual of the Apiary." As a quotation from this work we are correct in saying Hall instead of Keys, but whether Mr. Cook is right or wrong we do not know. We had intended to search the British Museum Library, fully expecting to find that our esteemed correspondent's corrections were warranted, but like so many people who have nothing to do, we have had no leisure.—EDITOR.]

A MARKET—VILLAGE BEE CLUBS.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—I am much obliged to you for sending me the first number of THE BEEKEEPER. I am only interested in so far as I, as a chemist and druggist, sell a good deal of honey, and like a nice clean English article when it is to be obtained. I bought about a hundredweight last year from Captain Martin, which was excellent, although being sent out in tins it was unsaleable almost in that way. I always put it into a nice white glass jar, fit to put on anyone's table, without being in anyway meddled with. In tins it is unsightly, and will not make nearly as good a price as in glass. Neighbours' put up the honey for sale better than almost anyone else I know. Village beekeepers want instructing how to make the most of their hives. I bought a lot of heather honey from Baslow, in Derbyshire, last year, but it was so dirty that I had to strain it all over myself to make it fit to present to my customers; the flavour was all right. Any beekeeper who had, say, one hundredweight of honey to dispose of could readily do so by putting an advertisement in the *Chemist and Druggist*, published the 15th of each month, or in the *Pharmaceutical Journal*, published weekly. As a rule, chemists sell more honey than other tradesmen. The price we usually pay is from 9d. to 11d. per lb. for good English honey. The wholesale London houses would expect to buy it in quantity about 2d. per lb. less. In large towns like this chemists get but very little, if any, offered to them by the country people. What little is got about here the people usually find a ready market for at the gentlemen's houses, getting 1s. to 1s. 3d. per lb. for it. In the thinly-populated country districts the cottagers could not singly well dispose of it, and often the druggists in those places will not take the trouble to collect it and redistribute it to their brethren in the larger towns without a good profit, and when sent by them to the wholesale houses in town you see there are two profits to be got out of it—in fact, three—before it comes to the public, viz., the collecting party, the wholesale trade in London, and the shopkeeper who sells it. The way would be for the village clubs to sell direct to those chemists who could buy, say, 56 lbs. and upwards at a time.

This last summer a deal of very excellent Californian honey in the comb (small supers, from 1½ lbs. to 3 lbs. each) has been sold in this town. I had about 56 lbs. of it, and soon sold it; it was very much liked, and I could easily have sold 112 lbs. if I could have procured it. I did not think the flavour quite equal to our English honey. It cost me about 1s. 2d. a pound nett, and I got 1s. 5d. to 1s. 6d. per pound for it; 2s. per pound is usually got for English white-comb honey here in the season. I have no use for the journal THE BEEKEEPER, as I have no garden, and I have no friends who keep bees; nevertheless, I wish you all success. In haste, yours faithfully,

JOHN S. BURNELL.

321, Glossop-road, Sheffield.

Nov. 14, 1879.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—I received the first number of the BEEKEEPER yesterday, for which receive my best thanks. An independent journal of this kind is just what was wanted, and if the following numbers turn out as well there is no doubt but that it will enjoy a good circulation. I shall do my best to make its merits known in the district. I trust you will be successful in your endeavours to establish a good honey market. This want is felt in Scotland as well as in England. Don't you think a few good houses might be established with advantage north as well as south of the Tweed? At all events, there might be one in Edinburgh, and probably another in Dundee. Of course this is for you to decide, but I merely throw out the suggestion. In connection with the above I might be induced to accept an agency; but as there are many details to arrange in connection with such a matter you will be good enough not to mention my name in connection therewith until we have seen further about it.

Enclosed you will find Post-office order for 7s., being my annual

subscription. Please send numbers when issued. Kindly own receipt of remittance, and oblige yours faithfully,

Nov. 14.

[We have received several other letters on these subjects, of which we give but one as a sample, observing only that much interest seems to have been raised about the matter.—ED.]

DENMARK.

TO THE EDITOR OF THE BEEKEEPER.

SIR,—Herewith I enclose a short account of our honey season, of which you can make what use you will. Time is rather spare in these days, or I might have sent a longer and better connected account.

We have a bee paper, which belongs to our Association, and of which every member gets a copy monthly—the price being included in payment or subscription, which is one kronor = 1s. 1½d. per annum—which includes and ensures all rights of membership, and a copy of our monthly journal, *Tidskrift for Bivavl.*—Yours faithfully,
J. S. Wood.

Nyborg, Fyen, Denmark, Nov. 3, 1879.

SULPHURIC ACID (TRANSLATED).

TO THE EDITOR OF THE BEEKEEPER.

SIR,—Thanks for the copy of the BEEKEEPER you so kindly sent me. I do not myself keep bees, but, like Felix, I am almost persuaded to do so. I notice what importance you place on the prevention of dampness in hives. When you were here a few winters ago did you not notice that the windows in our houses and railway carriages were double? I remember you, like all Englishmen, complained that our rooms were so fast closed that we never let in any fresh air. Well, instead of one set of panes of glass we have, as you will recollect, two sets, with a space between. This space is nearly air-tight, all the cracks and joinings inside being pasted over with paper to keep out draughts. And the windows are never opened in the winter, except when Englishmen are staying at our hotels, and then one can always tell, by looking up at a house, whether any of your countrymen are there, for an open window means an Englishman. If we took no precautions the insides of the double sets of windows would become all but opaque with moisture, and we should not be able to look out. To avoid this—you will see it in the railways as well as the houses—we have a small saucer or glass containing weak diluted sulphuric acid. This absorbs all the moisture, and leaves the glass clear.

How would the same idea act if applied to hives? I think—but of course you will take my idea for what it is worth, that of one ignorant on bee matters—that if in your upper hive a saucer were so placed it would be a great preventive of damp accumulating on the combs, or sides, or other parts of the hive. This is supposing that air from the lower hive can ascend to the upper, a point on which I am not quite clear. The acid, I think, would have no ill-effect on the bees, for they would not get near it, and it is not volatile, but of that you can judge much better than I. If I am right in thus believing, the only difficulty would be overcome, and accumulated damp would be avoided.

In any case, if you think the suggestion suitable to be laid before your readers for their opinion—with or without remarks of your own—print it. If not, why, it will help to swell your waste-paper basket—a consideration in these hard times, when I see advertised in an English paper you can get ten shillings a hundredweight for it.—Yours truly,
ARVID HERMELIN.

Charlottenborg, Sweden, Nov. 3, 1879.

AN IMPORTANT QUESTION.

THE past season has been an exceptionally bad one for honey getting. At many of the bee and honey shows, however, very good displays have been made of "this year's honey." Yet after the awards have been given the remark is too often heard, "I cannot believe that the honey shown by so-and-so can possibly be this year's!" Whether the complaint be just or not we have neither the means nor the wish to judge, nor do we desire to find fault with those whose duty it is to award the prizes. At the same time it would be a very desirable thing could some way be discovered to distinguish the honey of one season from that of a year or more earlier. Can any of our readers give us enlightenment on this point? In all honey a certain amount of evaporation must take place, and this, we imagine, should help us to some clue. Were there some means of finding out the age of honey, many complaints, groundless or otherwise, would be prevented.

THE MONTH.

THE last month of the year is approaching, and already we have been visited with frost. This is the season when beekeepers can find something to agree about—viz., that all colonies should already have been so well looked after and prepared for the winter's cold and rains that "a letting-alone policy" is the only one to be acted upon.

Those who have not yet done all that should be done will find so many articles on "Wintering" in the present number by competent writers that it would be waste of time to say anything further on the subject here.

But if the bees are left alone the apiarist has no need to be idle. Preparations for next year should be made, surplus hives prepared, all the necessary apparatus looked over and kept in order. The scientific part of apiculture should be studied, for too many beekeepers are lamentably ignorant of this part of the subject, and without some knowledge of it it is impossible to become an accomplished—(we shall seldom or ever make use of the word "bee-master" again, as some of our susceptible readers take exception to it, and want to know to whom we apply the term. They remind us of Mrs. Raddles wanting to know whom Bob Allen dared to call a woman! It seems that if we call Smith a "bee-master," Brown is offended; while, should we apply the word to Brown, Smith at once thinks Brown is the concealed director of our paper. While we are on the subject we may be allowed to observe how amused we have been to hear to how many different beekeepers the credit of the ownership and direction of this journal has been ascribed! At least, we *might* have been amused did not these vague and various opinions cast rather a doubt on the veracity of our statement that "no one connected with this paper is pecuniarily interested in beekeeping, nor will become so while he has anything to do with the journal." And but for this doubt of our truth, we should be proud to feel that our articles are so good as to be worthy of such eminent apiarians as those who have been credited with their production).

Another work that the beekeeper who is really anxious for the improvement of his favourite pursuit should give his attention to during the slack time that now prevails in the apiary is to find recruits to the practice, and to help those seeking knowledge with the benefit of one's experience.

To those possessing sufficient influence we would suggest the desirability of forming new county Beekeepers' Associations. There are many counties, some of them great in the honey industry, where no such association exists. The benefit of these societies is undoubtedly great, and every beekeeper should belong to one or another of them. An opinion has got abroad that we do not love these associations, and intend to attack them on every possible occasion. We are at a loss to know why this should be imagined, unless it is from the remark in our address to subscribers, wherein we say—"We shall do our best to help them (the associations), but shall not shrink from our task if we see that finding fault may do them good." If these words have caused the opinion to prevail, can it be because "conscience makes cowards of us all," and those who hold the belief of our intention to attack think there is some good cause for attack? Let us assure them that we have no desire to do anything that will tend to lessen the advancement of apiculture, but that all our endeavours are to increase and improve beekeeping. We wrote to the Rev. H. R. Peel, in his capacity of Hon. Secretary to the British Beekeepers' Association, telling him that if he

liked to appeal to the public through our journal with a view to increasing the members of the society he was very welcome to do so, and that as we are sending out between five and six thousand copies of this number we thought such an appeal might be productive of good. Unfortunately we have received no answer up to going to press; but we can only repeat that we shall always be glad to help, in any way, any of the associations that already exist, or those that may be formed hereafter.

While writing we have heard from Professor A. J. Cook, of the Michigan State College, at Lansing, U.S., who tells us that he is "very pleased with our paper." So favourable an opinion from so high an authority on entomology in general, and apiology in particular, has greatly pleased us, and we think no one can blame us for being proud of it. The only drawback is that such unexpected good testimony to the value of our endeavours has excited us, and causes us to end this article more abruptly than we intended.

OUR EXTRA PRIZE.

AFTER our first number was issued the attention of the Editor was drawn to the fact that the particulars of our Ten Guinea Prize had been omitted. These particulars were printed in the blank copies we had sent out; but, in the re-arrangement of the type, the printer missed them when making up the pages of the BEEKEEPER. We have consequently received several letters on the subject; but, fortunately, only one essay has been sent in.

We, therefore, are compelled to extend the time for forwarding essays, and will give until the last day in December.

The size we leave to the competitors, but no essay should exceed six pages of the larger type used in the BEEKEEPER. It can be as much shorter than this as the competitors may choose.

No particular style of hive is insisted upon, except that any hive described must be of such a nature as to give a manipulator command over the combs.

No minimum price for the hive is fixed by us, but preference will be given to such as can be made at different costs, according to the additions or improvements, which can be added by those who wish to have something very complete, and who can afford extra expense. At the same time it would be desirable if competitors, when possible, should give some idea of the cost of manufacture.

We claim no rights for the exclusive make of any hive. This would be in direct violation of the object we have in view in enabling any man to become his own hive-maker.

INSTRUCTIONS FOR BEGINNERS.

By E. D. BLACKWOOD.—No. 2.

"WHAT kind of bees shall I buy? Shall they be common black bees, or Italians? They tell me Italians are so much better. They are better workers, and can dip into flowers that the black cannot. They are more gentle and much more beautiful. Shall I begin with them?"

You see, a lathe is a more perfect instrument than a shilling knife, a sixpenny saw, or a twopenny hammer, and much more can be done with it. Yet is it not better to begin with the latter, as being so much cheaper, and to see what you can do with them? If this is no argument, remember that if you begin with black you can, after a time, turn them into Italians, and this fact should decide you to buy the common ones first.

If this is decided, the question next arises, "Shall I buy a stock, a swarm, or what?"

Buy a stock, *i.e.*, hive and bees together, if you can depend upon their being healthy and strong, for it is as preferable as it is profitable to buy a completed house rather than a skeleton that you have to finish yourself. If, however, you make up your mind to buy a swarm, do not purchase one of later birth than June, for later swarms are weaker and less able to stand the winter.

March is about the best time for buying, if weather is at all favourable. But a month or two later you can still purchase with a good chance of being successful. "Never buy in winter" is an old maxim that may generally have more or less truth in it; but this winter is exceptional, and many people, to my knowledge, with an eye to doing a good business, have bought stocks within the last month or two. Nor can I blame them. Swarms and stocks next spring will be exceptionally high in price, while many could lately be had for the trouble of removing. It was worth while to risk a few shillings in food, for if the bees die there is but little to lose, while, if they live through the winter, they will be worth far more than one can possibly expend on them. This is my own opinion, but I know that many older and more conservative beekeepers (the Editor has asked me to shun the word "bee-master," as likely to cause offence, it being a word that no two people seem to be able to define alike) will not agree with me. I will not lay a wager on the matter, as *has* been done before now in bee matters, for I remember what was told the gallant Knight Hudibras by his companion in the stocks: "Fools for arguments use wagers." But this I will say: if any one is bold enough to try the plan, he can see for himself what he might lose and also what he might gain, and is the judge of his own resources, and can therefore decide for himself whether he will run the risk or not.

"Having bought either some Italians or some common black bees, how am I, when the proper time comes, to increase them?"

There are two ways, the natural and the artificial. Let me talk of the natural first. But, beforehand, have you hives ready for new swarms? If not, do not read any farther till you *have* obtained them, for what is the good of bees if you have no where to put them?

You must know, to begin with, that when a swarm issues from a hive it is headed by the old queen, whose rule in the hive is taken by a newly-hatched queen. Your great object is to prevent the swarm from clustering in some place whence it will be awkward and troublesome to dislodge them.

A plan very often adopted is to clip the wings of the queen, as those of a fowl are often clipped when walls are low and poultry of too rambling a turn of mind. Some aver that this is injurious to the queen, but I can hardly think it is. At the best the queen has little to boast of as to strength of wing, and once having taken her wedding flight her wings are of little more use to her, and she would seldom use them except when she means to lead off a swarm. Nor am I alone in this opinion, some of our most celebrated apiarians (I nearly said bee masters) having led me, by their recorded beliefs, to this conclusion. At all events, the ant agrees with me, for it bites off the queen ant's wings itself, after she has been mated, so as to make her stay at home. If you clip off the queen bee's wings, do it carefully, taking pains not to squeeze the body, or injure her in any way.

When a hive is very full of bees in the spring or early summer, and when honey is plentiful, and the bees have been industrious in gathering and storing it, the workers build drone cells, and the queen sets to work to deposit an egg in each. This is the first sign of a coming swarming.

Then, when the drone brood seems well settled, queen cells are commenced, eggs laid in them, and the "royal jelly" (the food for queens) is deposited. This is sign number two.

Before the new queen or queens (for there are often several royal cells built) are hatched, and sometimes even before the cells are capped over, a rapid increase of bees clustering about

the entrance and an unwonted activity in the drones will be noticed. This is the third and last sign.

When the swarming takes place large numbers of bees hurriedly leave the hive, and after a time the old queen follows them. They then cluster upon the branch of a tree, or some other spot in their line of flight. Here they remain two or three hours, while, as some suppose, scouts fly about to look for, and decide upon, a new home. After remaining clustered in this way they fly away to the place decided upon as their future home.

If the queen does not join the cluster, the bees will, after a time, return to the old hive. And if the queen's wings are clipped so that she cannot fly, this will, of course, be the case.

Should you require the bees to return to the hive, and to remain there, you must catch and cage the queen. The simplest cage is a piece of wire cloth, "three and a-half inches wide, with twenty meshes to the inch. Wind this around the finger, let it lap each way one half-inch, and then cut it off. Ravel out the half inch on each side, and weave in the ends of the wires, forming a tube the size of the finger. We have now only to put the queen in the tube and pinch the ends together, and the queen is caged." Put the cage with the queen under the quilt. The queen cells must now be destroyed, and more room be given the bees for storing honey, either by adding "supers," or by removing frames containing brood. An hour or so after sunset liberate the queen, and quietness and industry will once more reign in the hive.

Should you, however, desire to form a new colony, take a new new hive, put it in the place of the old one. Put in it the caged queen, and, when possible, a frame or two containing honey and brood. When the bees return replace the original hive, and move the new one to a fresh place, and liberate the queen at night. In the old hive all the queen cells but one should be destroyed or removed.

There is another plan, by what apiarians call "dividing," but before this is explained it is necessary that the beginner should understand what are called "nuclei."

A nucleus is a small colony of bees kept for the purpose of rearing queens. The careful beekeeper will always have a few spare queens, and as it is desirable, for the sake of economy, to keep these queens with as few bees as possible, the nucleus hives are made very small.

(To be continued in our next.)

THE GARDEN.

WINTER BEDDING PLANTS.—In our last number we gave an account of an old-fashioned garden where "two old maids and a cripple" made the place beautiful with flowers, whose names, forms, and colours are as familiar to us as nursery rhymes. There was, even in this old-fashioned place, a slight attempt at ribbon-gardening, and we now give, as its perfect opposite, a short account of the very newest style of arranging plants. A gold medal was most appropriately awarded at the last meeting of the Royal Horticultural Society to Messrs. Charles Lee and Son, of the Royal Vineyard Nurseries, Hammersmith, for a display of winter bedding plants as curious as it was artistic and beautiful. The vestibule at the Exhibition-road entrance was planted by this firm, and filled with shrubs, &c., arranged in various designs. To take one of these, which was of oval shape. In the middle was a circle, inside the circle a square, the meeting points of its sides touching the circumference of the circle. The square was filled with *Euonymus latifolius elegans*, with a small pyramid in the centre, *Retinospora ericoides*. The parts of the circle not covered by the square held *Buxus nana variegata*. On either side of this circle, lengthways of the oval, were two other circles not quite so large, and separated from each other by a distance of about half the diameter of the smaller circles. The two circles nearest the centre circle contained *Cupressa Lawsoniana argentea*, the other two being planted with *Cupressa Lawsoniana lutea*. As an edging for the outside of the oval was a band of *Euonymus radicans variegatus*, relieved, four times on each side, by a semi-circle of *Euonymus aureus elegantissimus*. The groundwork of the whole bed was made of *Euonymus microphyllus*. In other parts, conspicuous by their beauty—if anything there could be conspicuous where all was beautiful—were the green-leaved *Aucubas* with

gloriously-bright red berries, standard green and pink-topped Privets, *Eunonymas* in lovely shades of bright gold and delicately soft silver, and standard gold and silver ivies exquisitely arranged. The beds were backed by trees and shrubs three to four feet high. There was a beautiful species of cedar, variegated red, and, perhaps the loveliest of all, a bushy green shrub with green and yellow leaves bordered with rich crimson. This was the *Cornus mascula aurea elegantissima*. The plants used by Messrs. Lee and Son possess two great advantages besides their beauty; they are hardy, and are not expensive. Who that owns a flower-garden has not often bewailed the dreary desolateness of the beds in the winter, when all the bright flowers and plants have departed, and only the bare earth is left? Now, instead of being obliged to have empty beds for four or five months out of the twelve, one can make them, like Madame Rachel, "Beautiful for ever."

FLOWERING SHRUBS.—Nearly all flowering shrubs are ornamental, and may be grouped together with beautiful effect, but the same treatment will not do for all alike. Some have a delicate abhorrence of the knife, while others flourish only after constant pruning, and the amateur in purchasing should be careful to ascertain which kind of treatment is most beneficial to the shrubs he is buying. And he must also find out when each shrub that requires pruning should receive this attention, for all do not take it equally kindly at the same seasons of the year. We annex a list of some of the best deciduous shrubs suitable for small flower-gardens and shrubberies. We copied it down some years ago in our common-place book, but omitted to make a memorandum at the time of the authority from whom we borrowed it, and cannot, therefore, give it to our readers. Some of the shrubs, however, we have grown ourselves with pleasing success. Of these we may mention the Guelder rose, the double-flowering cherry, syringa, lilac, laburnum, American creeper, and American currant:—

CHOICE DECIDUOUS SHRUBS SUITABLE FOR SMALL FLOWER GARDENS AND SHRUBBERIES.

- | | |
|--|--|
| <i>Althæa frutex</i> ,—bears various-coloured flowers, like single holly-hock; blooms early. | <i>Deutzia scabra</i> ,—flowers white. |
| Almond,—dwarf and tall; bears pink flowers; very early. | Guelder rose,—bears white balls of bloom. |
| Azaleas.—These may be had of many colours,—scarlet, red, orange, yellow, pink, bronze-colour, and shaded; bloom early. | Thorne's <i>Cratægus</i> ,—red, double and single; pink do.; white do.; and many varieties of fruit and foliage. |
| <i>Buddlea globosa</i> ,—orange-coloured flowers. | <i>Jasminum nudiflorum</i> ,—yellow. |
| Berry,—flowers in bunches, yellow, and succeeded by scarlet berries. | " <i>officinale</i> ,—white. |
| <i>Calycanthus floridus</i> ,—all spice-scented wood, with brown flowers. | Lilac,—purple, pale, white, Persian, and other varieties. |
| Cherry,—double-flowering. | <i>Lonicera</i> , an immense number of species and varieties, and nearly all good, ranging from 3 to 15 ft. |
| <i>Chionanthus fragrans</i> ,—dull coloured; flowers in the winter, highly scented, and before the leaves appear; requires a wall. | <i>Magnolia conspicua</i> . |
| Clematis (various).—The common is very hardy and fragrant. | " <i>purpurea</i> ; and many other excellent species and varieties. |
| <i>Clematis Siebaldi</i> ,—white, with blue centre. | Peach,—double-flowering. |
| <i>Clematis azurea grandiflora</i> ,—rich purple. | <i>Philadelphus Syringa</i> ,—highly-scented white flower; leaves small, like the cucumber. |
| <i>Cydonia (Pyrus) Japonica</i> ,—scarlet flowers; blooming several months in the year. | <i>Ribes sanguineum</i> ,—crimson flowers. |
| <i>Cytisus (Laburnum)</i> ,—yellow, purple, and other varieties; flowering early in the spring. | " <i>album</i> ,—white do. |
| <i>Daphne Mazereum</i> ,—red and white. | " <i>aureum</i> ,—yellow do. |
| | " <i>speciosum</i> ,—scarlet; a double variety—and many others. |
| | <i>Robinia (Rose-acacia)</i> ,—pink flowers; several varieties. |
| | <i>Spiræa</i> ,—many varieties, and all pretty. |
| | <i>Virginia creeper</i> ,—will grow to the top of a house, and the foliage turns crimson in autumn. |

A plant lately introduced by Messrs. Veitch and Sons from North India, where it has been found on the Himalayas at elevations as great as 12,000 ft. above the sea, is the *Hypericum oblongifolium*. Its yellow flowers and dark green showy leaves make it very useful for brightening a shrubbery in the late autumn. It is quite hardy in this country.

KITCHEN AND FRUIT GARDEN.—The gardening year may be considered to commence at this time, and it is useless to look for success in the spring if the ground be not prepared now. Every foot should be deeply dug and trenched to admit the free action of frost, and one cannot do better than make the furrows of a ploughed field their model in this respect. All refuse—vegetable substance, dead leaves, cabbage stumps, &c.,—should be placed in a heap to rot down. This wet manure from the pig sty or else-

where may be placed between the furrows, selecting a frosty day for doing so. The ground in February or March to be then levelled and cropped. Heavy clay soil under this treatment becomes to a great extent friable after the action of the winter frost. It is too often the custom to leave the ground from autumn to the following spring to lay waste, and not to dig it till seed time comes round. This is one reason of many gardening failures. Another is the want of manure. The ground is starved from the difficulty or expense of obtaining it; yet the inexpensive contents of the earth-closet from any average household, say five persons, is sufficient to keep a quarter of an acre of gardening in first-rate condition; but it must not be used for potatoes, as they simply run to top, and will grow four feet high, but hardly a tuber at the root. Early peas and Windsor beans may be sown now, but are not worth the risk; it is far better to leave them till February. The true work in the kitchen garden for the next two months is merely preparing for the coming spring. In the fruit garden let no time be lost in grubbing up old currant and gooseberry bushes and raspberry canes. Three-year-old bushes can be bought for four shillings per dozen, and will take much less room and give heavier crops. They should be planted about the garden in rows not altogether; if so, they choke each other. Every bush should be quite open to light and air, in which case success is certain. A moderate amount of manure forked in at planting is all the cultivator requires.

FLOWER GARDEN.—The list of suitable, pretty, strong flowering herbaceous plants is so long that it would be impossible to enumerate it here; suffice it to say that where any of this class of flowers are required they should be planted at once, before frosts set in. The weatherwise foretell an unusually severe winter. However this may be, the only safe course in gardening matters is to take time by the forelock, for whether December and January give us frost or give us rain and snow, it is seldom work of any moment can be done in the outdoor garden during those months; therefore it should be forwarded as quickly as possible while it is still open and the ground in a good state. The planting of the various hardy bulbous roots should be got on with. Tulips are usually disposed in beds like hyacinths. The bed should be trenched and composed of rich loam, rotten dung, fine leaf mould, and sand—silver sand if possible. The subsequent management in protecting and shading the finer soils is similar to that adopted for hyacinths; that is, spanning the beds with a low awning over hoop arches, or any other handy form of covering, to protect the plants from severe frost. The bulbs should be planted quite three inches under the surface, and six inches apart. Snowdrops, crocuses, lilies, narcissus, jonquils, crown imperial, fritillarias, gladioli, and other bulbous roots that remain out of ground may be got in during dry, open weather. Hyacinths and polyanthus narcissus are beautiful for spring decoration in the sitting-room, and where not already done they should be started at once either in pots or glasses that are made for the purpose.

HARDY PLANTS AT THE EXPERIMENTAL GARDEN.

The following plants, received at the garden last spring principally from Mr. Smith, of Worcester, and Mr. Ware, of Tottenham, have proved very attractive and of easy management, and being free growers have become well established in a few months; most of them have been previously grown and tested by me in a different soil. It will be seen that the majority are simply varieties of our indigenous British plants, but are none the less valuable on that account.

Achillea Ptarmica fl. pl.—One of the prettiest and most perpetual-blooming hardy white flowers grown, and very useful for cutting; and if I were confined to growing six hardy herbaceous plants this would be one of them.

Caltha palustris fl. pl.—Both the large and small-flowered varieties have perfectly-formed bright golden yellow flowers, the latter being dwarfer and preferable. Likes a cool soil.

Dianthus barbatus magnificus (double dwarf dark carmine Sweet William).—A bed of this in the Bedford Cemetery last year was for nearly three months a blaze of colour, and has this season been again the attraction of the place. It is easy of propagation, very free, and in all respects worthy of cultivation either for beds or borders; but sunshine best develops the brilliancy of its colour. One of the very best of the six.

Erysimum Barbarea fl. pl.—A very old-fashioned border flower. The double yellow Rocket does best in a cool but open situation.

Geranium pratense fl. pl.—Of this there are two varieties, one being fuller and of more perfect form, but not quite so bright in

colour as the other; the first being greatly preferred, however, by me. It lasts a long time in bloom, will grow anywhere, but likes a cool situation best. I should place it in the foremost of the six.

Lotus corniculatus fl. pl.—This when grown *en masse* is a most striking, dwarf, summer-flowering plant; is at home on a dry bank, and does well on the sunny side of a rockery.

Pyrethrum (Chrysanthemum) uliginosum.—This is a tall-growing hardy composite of the Reine Marguerite type, producing very freely in late autumn flowers with white rays and yellow discs almost as large as a good size dahlia. Most striking at this season, and very suitable for the back of a border or shrubbery. Should be more grown.

Salvia pratensis lupinoides.—One of the prettiest of all the Salvias, having purple and white labiate flowers freely produced.

Spiraea Filipendula fl. pl.—I should select this as another of the best six hardy herbaceous plants, as it is very pretty, dwarf, free, and easily propagated. Does best in a dryish situation.

Spiraea Ulmaria fl. pl.—Almost equal to the last, but is taller, and likes a moist soil. The flowers are also scented, but not quite so much as the single variety.

Trollius Fortunei fl. pl.—I know of no flower of its exact colour, as it reminds one a good deal of the setting sun. It is the prettiest of the tribe.

One of the best hardy annuals I have grown is the fine double variety of the common pot marigold, called Le Proust. The flowers are very perfectly formed and of a curious buff colour, with petals tipped brown and streaked orange and bright yellow, and will of course grow anywhere.—T. LAXTON, Bedford.

"IT'S AN ILL WIND," &c.

The great abundance of plants that are now blooming somewhat out of season marks the present autumn as one that has some special charms, for which we have to be grateful to the coolness of the past summer time. Our most favoured spring flowers, primroses, polyanthuses, violets, and pansies, are blooming profusely from strong crowns that have matured during the summer under conditions specially favourable to the production of flowers from hardy plants. When hot summers prevail many of these spring-blooming plants have enough to do to maintain their leafage, and too often lose it altogether. In such case the crowns are poor enough and the autumn has to perform the work that the summer should have accomplished. Now we are getting the product of the summer's growth, and though but a small recompense, yet it is one for some of the discomfort endured during that inclement season. A handful of flowers just gathered from the open borders in the second week of November is not wanting in variety and beauty, and tells of the kindness of the autumn more fully than words. Chrysanthemums, perennial asters, late intermediate stocks, marigolds, antirrhinums, mignonette, pentstemons, pansies, violets, tea roses, double and single primroses, polyanthuses, double colchicums, Japan anemones, all attest that there are flowers and beauty even when the leaves are falling from the trees, and signs of approaching winter are evident. Just as the robust crowns of the hardy plants have conducted to the production of autumn bloom, so will they also produce flowers specially early next year, and thus the floral season is greatly prolonged. Those whose notions of flower gardening begin and end with the customary bedding display know little what delights and pleasures lie hidden from them in myriads of hardy border plants.—*Gardener's Chronicle*.

[It is a relief to know that although the past season has been so ruinous to beekeepers, it has proved beneficial to at least one class of people, the florists.—EDITOR.]

As to Crows.—We do not venture an opinion on the following, culled from *Exchange and Mart*, but merely submit it for the consideration of such of our subscribers as are poultry breeders:—"A certain man kept poultry of sorts, and was much troubled by crows stealing his young chickens. He then, as a scare, utilised an old and faithful umbrella, and was soon shocked to find at least six crows utilising it too as a shelter from a passing shower."

POULTRY.

ARTIFICIAL REARING OF CHICKENS.

In our last number we gave an article on incubators and artificial hatching. We now follow it up with a few remarks on artificial rearing. There can be no doubt that the sole reason why the incubator is so seldom used in this country is that people fear the impossibility, or at least the great difficulty, of rearing chickens after they are hatched. Although much care is undoubtedly needed, the difficulties are much exaggerated.

In the BEEKEEPER of the 15th October appeared a letter from the Hon. Slingsby Bethell, of Tangier Park, Basingstoke, speaking highly of the success he had met with from his Christy and Co.'s hydro-incubator, and of the good results derived from the artificial mother. "Every person breeding chickens or game," Mr. Bethell remarked, "should possess one or two of these, whether they use hens or incubators for hatching purposes." Here is, at all events, one witness to the possibility of rearing artificially.

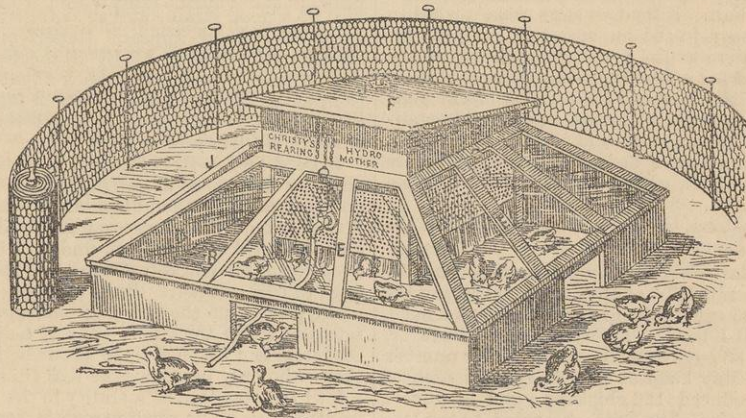
The whole question resolves itself into this: What is the best substitute for a mother? And to solve this question the duties and performances of a hen must be carefully watched and copied. Now when the chickens are sheltered beneath a hen's wings they are warm at their backs, but comparatively cool at the feet. Indeed, one often sees a hen gathering its chickens under its wings and settling on ground that is quite cold. And if the feet of the chicken, the moment it is taken from beneath its shelter, are felt, they will be found cold. This fact has been overlooked by nearly all who have tried experimental rearing. Réaumur was the first to call attention to it, and he invented and used an "artificial mother" on this principle. This was after repeated experiments of bringing the chickens up on a hot bed or in warmed rooms. He reasoned, too, that the chickens had no equivalent for the pressure of, besides the descending warmth from, the body of the mother.

His apparatus consisted of a box lined with sheepskin dressed

with the wool on it, the bottom of the box being of a square form, the roof sloping. The desk-like slanting direction of the covering allowed the chickens to arrange themselves according to their several sizes; but as they have, like all young birds, the habit of pressing very closely together, and even of climbing upon one another, the small and the weaker being therefore in danger of being crushed or smothered, M. Réaumur made his artificial mother open at both ends, or, at most, with only a loose netting hanging over it. Through that the chicken could escape, if it chanced to feel itself too much squeezed; and then, by going round to the other opening, it might find a less inconvenient neighbourhood.

The chickens took to this artificial mother eagerly and naturally. As Réaumur himself says:—"As soon as they had taken their little meals, they were seen jumping and capering about; and when they began to be weary they crowded to this mother, going so far in that they were compelled to squat, as I perceived by the impressions of the backs of several chickens on the woolly lining when the cover was turned up. Chickens, indeed, direct from the hatching oven, from twelve to twenty-four hours after their escape from the shell, will begin to pick up and swallow small grains or crumbs of bread; and, after having eaten and walked about a little, they soon find their way to the fleecy lodge, where they can rest and warm themselves, remaining till hunger puts them in motion again. They all betake themselves to the artificial mother by night, and leave it exactly at daybreak, or when a lamp is brought into the place, so as to produce an artificial daybreak, with which, it is worthy of remark, old hens are not affected, but remain immovable upon their roosts."

This proof that the newly-hatched chickens will take kindly to an artificial mother, and that they are able to feed themselves, should remove at least some of the doubts that cross the minds of many who would like to experiment with an incubator, but who, believing in the perfect hatching powers of the incubator, have no faith that artificially-hatched chicks can ever be brought up.



The artificial mother invented and used by Réaumur, however, was far from perfect, and several improvements were made upon it. The chickens were prevented from climbing upon and crushing one another by lowering the sloping roof. We saw an improvement on this the other day, which was used by a poultry breeder who has no incubator. The artificial mother in this case was made of four boards nailed together like the four sides of a box. Two opposite boards had entrances cut away from them. All were lined inside with lambskin with the wool dressed on. Instead of a wooden roof there was a loose sheet of lambskin over the wooden frame, having small weights attached at certain distances, so that the skin could be raised by any chicken which was taller than the others. On the skin was placed some light sand which had the effect of pressing the skin down where it was needed. Above the sand, but not touching it, ran two or three pipes containing warm water. These were fixed beneath a board. Over the board was a kind of canopy of felt, held up by a wire frame resting on the wooden sides of the mother. The felt descended to about an inch of the ground on two sides (being about three inches from the wooden sides), and to just above the entrances on the other. These entrances were hung with flannel. Our friend told us he had used this artificial mother with success, and had found that its chief

recommendation was the ventilation without draught which it obtained.

Other inventions have been made and tried, but the best of all are those of Messrs. Christy and Co., which are the result of much study and various experiments, and have proved highly successful.

Their "hydro-rearing mother" is heated in exactly the same way as their "hydro-incubator." That is to say, there is a cistern which is filled with boiling water, which is renewed once or twice a day according to the temperature of the atmosphere, an average heat of 60 deg. to 70 deg. being very easily kept up, as a rule, by replenishing at morning and evening. Beneath the cistern is a loose sheet of soft felt. The chicks press with their backs against this felt, and feel the warmth of the cistern through it. The reason felt is used is because it can easily be replaced as soon as dirty, the great defect of sheepskin being that it so soon becomes soiled and is not readily cleansed. Neither does the felt offer such a home for vermin as the wool.

The cistern stands upon four legs, and its height can readily be arranged according to what is required for the chicks confided to its care. The "mother" is placed in a small fence, enabling the chicks at any time to come out into the open air, but not to wander too far off.

An improved and adapted form of the "hydro-rearing mother" is the "open-air mother or game rearer," of which we give a drawing. It is especially suitable for poultry, pheasants, grouse, and all kinds of game.

The hydro-rearing mother A is made with a sloping roof, F, to resist the weather, and is placed in an extra large park or fence, B, the sides of which, D, support, on three sides, removable glass frames, F, serving as protection to the young birds from wind, wet, and cold. In fine weather these glasses can be raised, as shown at J, and the doors in the park opened to let the birds into an enclosure, which should be constructed with wire fencing, as shown in this sketch. In wet and cold weather they still have the advantage of a fine large dry run, where they are fed.

The temperature underneath the mothers is kept at 70 deg., or thereabouts, but the working is so simple that by putting the hand underneath one can easily tell whether the chicks feel sufficient warmth on their backs, which is all they require.

With eggs plenty of moisture is invaluable, but the contrary holds good with the young chicks, which require warmth and protection from all damp. The slanting roof and glass frames in the open air rearer prevent any rain getting in, and the park well sanded, or covered with plenty of cut straw, keeps the young birds dry under foot. The difficulty with pheasants is their extreme wildness, but by hatching out a few young chickens, and running them with the pheasants, the latter follow the example set them, and soon take to feeding themselves, quite as well as the chicks do. A capon will take charge of them if it is placed near this open air rearer.

Commenting on a poultry show at Ayr last year the *Live Stock Journal* remarked:—

"The Marquis of Ailsa exhibited a hydro-rearing mother, and in it were 31 chickens, 35 days old, that had been hatched out with one of Christy's incubators. Mr. Cox, gamekeeper to the Marquis of Ailsa, who had charge of the incubator, has had over 15 years' experience of hatching both pheasants and poultry in all their phases. The incubator was kept in the kitchen, where the temperature averaged about 70 Fah. Fifty-two eggs were placed in the drawer, 15 of which were rejected as unfertile, and the remaining 37 all hatched out alive at the proper time, being at the rate of 100 per cent.; not bad for a first experience and trial of an incubator. Accidents or casualties lessened the number of chickens till only 31 were left, and certainly the 31 looked in splendid condition, more like birds two or three months old than 35 days. Mr. Cox states that these birds are better fledged, heavier, and more active under the hydro-mother than what chicks would be under a hen."

Mr. E. J. Barnes, of Leytonstone, writing to the *Standard* on the 3rd October last, says, *appropos* of artificial rearing:—

"I commenced operations last February by purchasing a hydro-incubator, which I first tried with 17 "shop" eggs, producing me seven chicks. I next put in 85 eggs, principally from my own hens, and got 63 chicks. In April I bought another hydro-incubator, and got the two to work with 85 eggs in each, out of which number I obtained 132 chickens. In May I again put 85 eggs in each of my hydro-incubators, and produced 126 chickens; and in June I got 102 chickens and ducks from 140 eggs entrusted to the two machines to hatch out. The grand total of my hatching was, therefore, 430 chickens and ducks, all of which, after two days, passed in a basket before the kitchen fire, were put under an artificial mother. One point about these latter appliances deserves most special attention. During all this season not a single chick reared under them has suffered from vermin or parasites such as no bird reared under a hen can be kept free from. The effect of this cleanliness has been to cause my artificially-reared birds to grow far stronger and larger, and much more quickly, than the few I have left to hens to bring up. In my opinion the absence of parasites in these young chickens means a very perceptible increase of profit in thus raising them.

"I have now got into a regular system of working my hydro-incubators, which I think partly accounts for my success with them. I fill up both the machines on the same day. After seven days I reject the non-germinated eggs, and replace them by fresh eggs, so that my hatching is really only completed on the twenty-eighth or twenty-ninth day. Then for three days I work the hydro-incubators empty, allowing the drawer to remain open for thorough cleansing and purifying. I make, therefore, about one hatch per month for each machine.

"I calculate my average hatching to be at the rate of fifty-five chicks out of every seventy fertile eggs, or at the rate of seventy-

eight per cent. for the entire season. Out of 430 ducks and chickens I have lost thirty-two from various accidents, chiefly from so much wet weather, but all the survivors have been reared artificially.

"This next season I purpose beginning to hatch in November, and shall go into it more thoroughly. I mean to have a fine stock of nicely-fattened young chickens and ducks before our old friend the 'hen' has made up her mind to begin sitting on her eggs.

"I should like to say one word more upon another subject which has been mentioned from time to time in your columns, and this is the prickly comfrey. I use it frequently and regularly, both for my fowls and for a lot of Belgian hares which I breed. The fondness of the latter for it is most extraordinary. They will always leave cabbage for prickly comfrey; but its value to me for their keep is that, however much they eat of it, and no matter how frequently I give it them, prickly comfrey never has the pernicious effect upon them that too much green food of any other kind produces. For the fowls I hang up a fresh-cut bunch for them to peck at, and much they enjoy it. Prickly comfrey answers admirably with me, but of two purchases of it which I made, one has turned out worthless, and is, I suppose, the wrong sort."

(¶) We trust we have said enough to show that the difficulties of artificial rearing are more imaginary than real.

THE POULTRY YARD.

YARDS should now be arranged and the birds allowed to settle. Having selected a good stock of hens and pullets, the thing will be to get rid of old cocks, and to get first-class cockerels. In stocking a yard with purely bred fowls it may be well to set apart a small run, either fenced out by wire, or, what is still better, some outlying barton. Here three or four hens, mated with a vigorous cockerel in no way related to them, will produce eggs enough for placing under inferior hens during the earliest and best months for hatching out stock and show birds. A few shillings are not thrown away on a cockerel; some people are content to obtain a faulty bird of a good strain, and so defects are perpetuated. Again and again the old sore appears. Imperfect feet, bad combs and colours should not be tolerated. By all means get good blood, but not at the expense of good form. Look about for a breeder of good reputation, make up your mind to pay a fair price, and get the best you can get for your money, is about the best advice which can be offered. We live now in dark days.

If good birds will not pay, it is certain bad ones will not; a good one may cost more in getting, but is not more expensive to keep, and brings more when disposed of.

Some of our most successful breeders prefer the Brahma hen and the Dorking cockerel, finding they can thus breed hardy and good fowls for market, which have also an advantage, as they lay eggs in cold weather. But even where Brahma-Dorkings form the main portion of the stock of chickens, it cannot be undesirable to set apart a few Dorkings, so as to maintain a home supply of pure cockerels and to be able to profit by the wants of exhibitors or of those who only patronise the real thing. Even in the purchase of a fowl the standard of morality in the world is so low that cheating in some way or by some person is very general. As with a horse, so in the small matter of a cockerel, we may not object to pay the money if we were only sure of getting what we wanted. Let us suppose that somebody, A, wants, but does not know, a bird when he sees it: so he goes to somebody, B, who does know the points; but unfortunately somebody, C, has a yard of Dorking fowls, and he is more the friend of B than of A. In such a case the result of a deal is that C gets the best of the bargain. B does not do badly, and A is "done." There is a great deal of such roguesy as this, it is to be feared, amongst those who have to do with the disposal of the live stock of the farm; therefore it is the more necessary to take care to get the best, by considering where it is to be found, and how to get it.

One of the things that fanciers ought to be careful of is over-feeding, and many birds that would have still been alive and well have fallen victims to apoplexy, caused by heavy feeding. We know it is tempting to owners of stock, in which size is a great point, to feed up their birds and push them on by giving them plenty of fat-producing foods. It is necessary at all times to feed heavy birds well if size is to be got, but great discretion must be used in the doing of it. We think there is little to fear if the birds have plenty of exercise, but where they have limited runs a lazy habit is engendered, and if an abundance of food is given an excess of flesh is

the result. The death of many birds that die suddenly from apparently unaccountable causes is undoubtedly due to this, and we would warn our readers to beware of over-feeding. In all our experience of poultry keepers, for one that *under* feeds a thousand *over* feed. Of course, there is a great difference in birds; some will eat just the right quantity whilst others feed to repletion, and a watch must be kept on the latter, or they will eat what others ought to have. If necessary, these birds must be kept separate and fed sparingly. In case of a bird that has gorged itself and there is danger of apoplexy, the system should be reduced at once by being put on a low diet, and a little purgative medicine given. Whilst heavy feeders need to be looked after, it is quite as necessary to attend to those that feed badly, for they will never thrive well unless they can be induced to eat properly. In the first place the bird should be examined to see if there is any disease about it, and if no trace of any can be discovered the effect of a tonic should be tried, either in the form of a stimulant in the food or a tonic in the shape of medicine. For the former either Brown's Compound or Chamberlain's Canadian Meal are good, and every poultry keeper should have one or other of these at hand always. For a tonic we can recommend Walton's Tonic Paste or cod liver oil and quinine capsules. Sometimes all these fail, and the bird will not feed no matter what is done. In such a case as this we would be inclined to try a constant change of diet, taking care to give very little food, as the whole may be caused by having too much offered. We know that sometimes we ourselves can eat when we have a very little offered to us, but if there is an abundance the sight of it sickens us. If we treat our birds in a common-sense way, same as we treat ourselves, we are likely to succeed most of all.

Fanciers often have birds which do not, in spite of all their efforts, thrive properly, which have no disease about them, or at any rate one that shows any symptoms, yet the birds do not thrive at all. They eat well and have all the outward appearance of good health, but keep thin and out of condition. We believe that the cause of this is, in most cases, worms, but few seem to think that fowls can be troubled with worms, and never suspect this as the cause. In the first place, therefore, it is necessary to carefully examine the excrements in order to ascertain if worms are present in the system, for they are almost sure to be thus expelled if so present. A mere cursory examination is scarcely sufficient, and if the worms are not seen at the first, it should not be at once decided that they are not in the fowl, but further examinations must be made. When worms are thus discovered, the next consideration is that of getting rid of them, for no fowl can thrive so long as these troublesome parasites are present. The best remedy we know of are turpentine capsules, but care must be exercised in the giving of them, as they are strong, and not more than one at a time ought to be given. In fact, we think if the turps was mixed with a little oil it would be all the better. Some hours after the turpentine capsule has been given, some castor oil must be administered to carry off the worms from the system, and when it is thought that all have been expelled, the fowls should be fed upon good food with doses of cod liver oil, either by itself or with quinine.

USE THE INCUBATOR.

It cannot be used for laying eggs, but always attends strictly to the business of hatching. It is easily kept clean and healthful, and the artificial mother which accompanies it never fails to hover the chickens when they want hovering. The chickens appear to be healthier and stronger when hatched this way than when hatched by the hen. The incubator does not trample and break the eggs, nor crush or neglect the chickens. It is always ready and willing, and can be depended upon. One knows exactly what to expect of it every time. It does not get lousey, as the hen does, and certain diseases—as the gapes and cholera—are unknown in the incubator family. It does not eat or drink anything, only the chickens needing to be furnished with food and drink. One kerosene lamp will run the thing, and it will do the work—even the smallest size—of a dozen hens in the hatching business. The chickens come out clean, bright, and lively, and only have to be provided clean, airy, and sweet quarters to keep them healthy and thriving, on clean and nutritious food. "The good old way" of hatching and raising chickens is about "played out." Improved methods have taken its place, leaving the hens to do the duty of laying the eggs. By the new methods good-sized "spring chickens" are grown in six or eight weeks, and got ready for market. It costs but a few cents to raise them, and they are worth from seventy-five cents to one

dollar a-pair. We say there is profit in this business, if properly conducted; but no one without all the facilities should engage in it. What is profitable when rightly done may prove a total failure when wrongly done. With moderate means, it is easier producing only eggs. For this purpose it is only necessary to keep the hens properly. Eggs in winter bring a good round price, and to keep and feed hens so as to make them egg-producing in winter costs but little more than the ordinary method, which secures few eggs except in spring and summer. What is worth doing is worth doing well is as true of the poultry business as of anything else.—*American Dairyman*.

POULTRY SHOWS.

We are sorry that owing to want of space we are not able to give any reports in our present number.

POINTS.

In our next number we shall commence descriptions by a well-known authority of the different kinds of show fowl, taking them in alphabetical order. The first will be on the Andalusian.

NOTES AND QUERIES.

NOTICE TO CORRESPONDENTS.

We do not undertake to reply at once to every query we receive, although we shall always endeavour to do so. Those beyond our power of answering we shall invite our readers to discuss.

Those queries that we think too simple to appear in THE BEEKEEPER we shall answer by post.

Subscribers wishing for replies by post may have them if they will enclose in their letters stamped directed envelope. We cannot undertake in every case to answer by return, but shall do so when possible. Queries that we are doubtful of solving accurately we shall submit to some of our experienced subscribers who have already kindly promised to help us, and inquirers must in these cases grant us the requisite time to obtain the best information. If, instead of receiving answers by return, our correspondents are kept waiting four or five days, they will know that we are consulting some of the best experienced apirians.

Name and address must accompany all inquiries, but not necessarily for publication.

Nos. 11 to 29, from J. Byers, J. G. B., H. Caunter, A. Donning, H. V. Edwards, R. Edwards, Herbert Eyre, Helen, Holderness, Ignoramus (two), Wm. Laycock, May, Miss G. L. C. N., Omicron, G. H. R., James Steuart, John Weatherstone, and N. A. W., all answered by post. If information not sufficient, please write again. If you write after the 10th of the month—five days before publication—you must excuse us if our replies do not reach you by return of post, as we are necessarily very busy just then.

No. 30.—How, when, and where to find and take the nests of bumble bees.—GEORGE STATHAM, Roby.

Answer to No. 30.—Too late this season. With the exception of the queen all the humble, or bumble, or more correctly the *bombus*, bees die. Their nests are generally underground, beneath the shelter of trees or posts, or in some open shed. The queen in spring generally makes a new nest in the earth, gathers a store of bee-bread—most likely honey and pollen—and lays her eggs therein. This, we imagine, would be the best time to watch for the queen bumble bee, and to take the nest when found; for the larvæ, when they are hatched out, eat out thimble-shaped spaces, not unlike in form the queen cells of our hive bees. When the bees issue from these cells the same are strengthened by wax. At first the bees are all workers, later come queens, later still males.

No. 31.—What are the causes and what the signs of foul brood in a hive?—WM. SAINSBURY, Lincoln.

Answer to No. 31.—Foul brood is brood attacked by fungoid growths, the spores of which are often too small to be seen by the naked eye. The signs are: Decline in the prosperity of the colony, because of failure to rear brood.

The brood seems to putrify, and gives off a gas having a most unpleasant smell. The caps of the cells become concave instead of convex, and have a little hole through them. The best known remedy is salicylic acid, a white vegetable powder that must be mixed with borax to make it soluble in water. See our last number.

No. 32.—Will bees always take comb foundation when it is prepared for them?—R. BARKER, Dorset.

Answer to No. 32.—We presume you mean, will bees always begin on the comb foundation in a frame when they work the frame at all? Not always, though recorded cases of their having commenced elsewhere in the same frame are few. Sometimes, however, bees in supersections seem to prefer to commence at the bottom of the frame, and in rare cases they have begun at both top and bottom together.

No. 33.—How is mead made?—PETER KING, Salisbury.

Answer to No. 33.—The recipe given by the late Mr. J. H. Payne is as follows:—Pour five gallons of boiling water on 20 lb. honey; boil and remove the scum as it rises; when it ceases to rise, add 1 oz. of hops, and boil for ten minutes afterwards; put the liquor into a tub to cool. When reduced to 75 deg. Fahrenheit, add a slice of bread toasted and smeared over with a little yeast. Let it stand in a warm room and be stirred occasionally, and when it carries a head tun it, filling the cask up from time to time. When the fermentation has nearly finished, bung it down, leaving a peg hole, which may soon be closed; bottle in about a year. A later receipt, by Mr. Symington, is:—Boil for one hour 26 lb. honey in six gallons of water, removing the scum. Add 3 oz. of hops, and strain into a vessel to cool. When milk warm stir in a tablespoonful of yeast, and let it work twenty-four hours. Skim off the yeast, put the liquor in a barrel, and fill up daily as it works over. Bung down and bottle for twelve months, adding half a wine-glass of brandy to each bottle. "The result is a very clear-drinking vinous liquor, very different from the cloying sweetness of the majority of the samples." An improvement, suggested by Mr. Symington himself, we believe, is to add the brandy (half a bottle of best pale), and two lemons, sliced, when the liquor is in the barrel.

AUSTRO-GERMAN CONGRESS.

HERR RUDOLF MAYERHÖFFER, editor of the *Oester Bienenzeitung*, writing us on the 1st inst., tells us that the Austro-German Congress of Beekeepers was held in Prague on the 7th to 11th September. The exhibition was very large—America, England, France, Italy, and all countries of the Austrian Empire being well represented. The Russian Order of St. Anna was conferred upon Dr. Dzierzon, "the first and most celebrated master of beekeepers." The debates, however, were neither numerous nor interesting, system apparently being wanting, as it too often is at our own beekeepers' meetings. Herr Mayerhöffer promised us a detailed account of the Congress, but it has, unfortunately, not reached us up to the time of going to press.

LONDON HONEY MARKET.

The following are the quotations for the past month:—

		1879.		1878.	
Oct. 18	... Cuba ... per cwt.	25s. to 38s.	.....	30s. to 50s.	
"	" ... Jamaica "	.....	27s. to 40s.	.....	35s. to 45s.
"	25 ... Cuba ...	.....	25s. to 38s.	.....	30s. to 50s.
"	" ... Jamaica "	.....	27s. to 40s.	.....	35s. to 45s.
Nov. 1	... Cuba ...	.....	36s. to 50s.	.....	30s. to 48s.
"	" ... Jamaica "	.....	30s. to 40s.	.....	35s. to 45s.
"	8 ... Cuba ...	.....	36s. to 50s.	.....	30s. to 50s.
"	" ... Jamaica "	.....	30s. to 40s.	.....	35s. to 45s.

Sales have been inconsiderable. Some remarkably fine but small piles of Cuba found a ready sale at a high price. No arrivals from California of any import. Some few hundreds of barrels of Chilian were bought in, holders expecting a rise.

THE SCIENTIFIC VALUE OF MICROSCOPIC PREPARATIONS.

DR. PELLETAN, writing to the *Journal de Micrographie* on the above subject, says:—

"You complain in your letter of the little scientific value of the majority of microscopic objects prepared for sale, and you have good reason for doing so. With the exception of a few these preparations are insignificant. They are often very beautiful in appearance, mounted on the choicest glass in an irreproachable cell, with varnishes of all colours, the labels of every shade, and are very elegant to look at; but the object they contain is worthless. The preparations of diatoms are alone, for the most part, satisfactory, often excellent, and sometimes marvellous. All the world is acquainted with the preparations of diatoms of E. Wheeler, A. C. Cole and Son, and above all of J. Moller, whose 'Typenplatte' is a veritable *chef d'oeuvre* of patience and manipulation. Certain preparations of cryptogamic botany are also of some value, as sections, dissections, &c., of vegetable anatomy, thin cuttings of dense substances, animal, vegetable, and mineral, and particularly sections of wood, are all very instructive, but of all other classes of preparations whose nomenclature fills the catalogue, it is only by chance one meets with an interesting slide.

"From what you have said I perceive that you are occupied with microscopic anatomy, and more especially that of insects. But histological preparations, whether normal or pathological, whether of man and other vertebrates, or of the invertebrates, are precisely those of the least value.

"Of the Arthropoda, among others, the preparers limit themselves to amputated feet, heads, antennæ, tongues, stings, &c., mounted in balsam, and behold the result. Others, more ingenious, mount large insects or immense spiders entire, after having emptied them of their contents, and these preparations have really a magnificent appearance. But, alas! the integument is all that has been preserved, and the little that remains of the internal organs is represented by a uniform transparent mass in which the microscopist finds nothing to study, and in all the smaller kinds of insects they are also in a more or less transparent condition, containing more or less opaque masses, covered with a well-preserved integument, and to this state they are reduced by the preserver.

"In England we sometimes find preparations that are mounted without pressure; in these the insect is placed in the middle of a thick mass of balsam, after having been impregnated with some essential oil to render them transparent, and not being pressed they are not deformed.

"Some of these preparations are very successful, particularly those of spiders; we can also perceive the remains of the internal organs, the muscular system, for example. I have also made a good many of them, but although they possess some advantages, their thickness (sometimes several millimetres) prevents their being studied with objectives of a short focus.

"I would not say that all preparations which I call trivial are useless: most certainly not. If they are not satisfactory to *savants*, they interest *amateurs*, and they teach many things that otherwise would not have been known. They are also useful in England, where they are sold in large numbers, because among our neighbours the microscope is more used for amusement and as an object of luxury than for working purposes.

"The young 'misses' in the drawing-room are better amused with, and, I believe, more usefully employed, in admiring the delicate little comb that forms the claw of a spider's foot, or the elegant little scales that enamel the wing of a butterfly, than in examining the insipid portraits in a keepsake.

"These slides, that for us have little interest, are therefore in this point of view of real utility. They give to ordinary people the taste for natural objects, and they furnish a thousand little instructions acquired without labour, and are also amusing. We must, therefore, not too much despise them.

"How is it that preparations of diatoms are always satis-

factory? Primarily, because they are in reality the most easy to make. The diatoms relatively require but little manipulation to prepare them for mounting, and in consequence of their beauty the study of these little organisms has largely increased. The preparers are, therefore, all more or less diatomists; they know what to do, they know how the object ought to be mounted. Certain vegetable organs are also well displayed, as there the preparer also knows how best to mount them as trachea, stomata, ovules, spores, organs of fructification, &c. But when they attempt animal anatomy, whether that of the vertebrates or invertebrates, whether normal or pathological histology, the preparers, with very rare exceptions, have not sufficient knowledge to know what is necessary to make visible, what is the characteristic detail he should render evident in order to make the preparation instructive. They imagine it to be sufficient to take a piece of tissue, injected or otherwise, harden it, make longitudinal and transverse sections, then steep it in carmine, mount it in a beautiful cell; and by these means obtain a slide useful for something. This is a grave error. For example, I have before me various "commercial" histological preparations, disassociated muscular fibre, a torn nerve filament, a slice of conjunctive tissue, the nerve terminations on a muscular fibre. What do I learn? The muscular fibres have not been stretched. I do not see sarcolemma made evident, nor the nodes, nor the least detail of the striæ, discs, and transparent spaces.

"The nerve filament shows me some little clotted threads scattered in the midst of a small cloud of conjunctive tissue; but of the myaline sheath, the cylindrical axis, the annular constrictions of the nodule of the segments of the endothelial cells (I do not speak of sections) I see nothing of all these.

"In the connective tissue I look in vain for a distinct element, the connecting fascia, and the elastic fibres; all is confusion, and the conjunctive cells are absent. In the nerve terminations on muscular fibre I see a small yellow patch on the fibre; this is the motor plate, but the sheath, the ramifications, the nodules of various kinds, are all invisible.

"You will tell me that of all specimens, histological are the most difficult and tedious to prepare, and that it is generally impossible to show all these details in one preparation. This is true, but it is only a secondary reason. These difficulties are overcome by the facility given by practice.

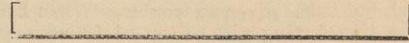
"If one wishes to see all the details of structure in any particular organ, it is necessary to make many preparations. Alas! as I before remarked, preparers, with very few exceptions, have not sufficient histological knowledge, and are ignorant of the necessary technical methods, or even the will, because they are tedious and delicate, and they, moreover, fear that the increased cost of these preparations would frighten those who might wish to acquire them. I believe there is no foundation for this last reason, and I judge from the daily demands for preparations made on these principles, even at an increased cost, when they are really instructive, and I cannot doubt it when I see the most common specimens of *Pediculus pubis*, sold in America for 5 fr. 75 c., in which country it is not rarer than in France."

NEW MODE OF TRANSFERRING, &c.

I WOULD like to give your readers an idea of fixing the comb in frames that I have never seen in print on your side of the Rocky Mountains.

I fasten the comb with wires, which secure them and is more easily adjusted than any way that I have ever seen or heard of; would like to have you try it, and if you find it speedy and practicable, to give it to your readers and beemen, or women in particular. After having fitted the combs to the frames, or rather before, take the frame that is to hold the combs, get some No. 14 annealed wire, bend $\frac{1}{4}$ inch at right angles, then bend at right angles the width of the top bar from that, then measure from the top of top bar to the bottom of bottom bar and bend parallel with the last bend, and cut about $\frac{3}{4}$ inch from the angle, leaving an end $\frac{3}{4}$ inch long. Now to use it, fit the comb as usual to the frame, take an empty frame and fill one side with as many wires as are necessary, by fitting it on the top bar first and pulling it down so that the

$\frac{3}{4}$ inch end slips under the bottom bar (I generally have two light boards the size of frame or very little larger, the comb resting on one of them), then press the frame down over the comb, lay a light piece of board over the wires, take comb and frame up between the two pieces of board, turn them over so that the bottom side is uppermost; slip more wires on the now upper side, and the job is done. I always have a lot of wires on hand to fit the frames, and they can be used again and again. The shape of the wires finished is thus:—



If the long side is made a little bowing they will always spring against the comb to keep it in place, and the top can be made to fit so that it will never come off by accident. The wire does not interfere with the bees so much as strings or sticks; the bees cannot bite them and the bottom bar cannot sag; they can be removed without jarring the comb, and if left on all the season, as I have done occasionally, do not seem to discommode the bees. I like No. 14 wire best, as it is stiff and sure. In case the comb does not come down to the bottom bar I place the frame bottom up so that the comb presses against the top bar, and put a temporary bottom bar in bowing, so that the ends rest inside the end bars, and touch the bottom bar, and the bow pressing firmly against the lower part of the comb; then with the wires on the bottom-bar cannot sag; and it will press against the top-bar while the bees fasten securely. With these wires it does not matter whether the transferred comb is full of honey or not; there are no strings to tie with honey-daubed fingers, and one can do the transferring without any trouble, and with a great saving of time. I have used them for two seasons, and have seen nothing to beat them. I charge nothing for the patent, and only ask for the credit of originality, if found practicable.

I am using the Langstroth hive and frame, but on account of bees swarming so in this climate have increased the depth of some of my hives, giving a frame $10\frac{1}{4}$ inches perpendicular; have the pure Italian bee (50 odd colonies); have worked comb honey in sections, size of sections 6 inches horizontal, $5\frac{1}{2}$ inches vertical, $1\frac{1}{2}$ inches wide, $\frac{1}{4}$ inch thick; use tin separators, and tier up when necessary; hives from 5 to 8 feet apart, and 3 or 4 inches from the ground; no shade yet; clip all queens after laying; have returned swarms, cut out queen cells, and given more room; ventilated as much as possible, but bees did not give much comb in sections until late that was all capped over; considerable was nearly capped for a long time, and got discoloured before being finished, though the second-story frames were all sealed over in some hives, and one hive last week had 21 frames and 27 sections, the sections same as I gave them in March, and 15 frames solid combs, the balance full of brood; the young queen just having laid, the colony filling the hive did not swarm out at all, but have banished their drones. I still have drones, and among some 90 or more queens had only one drone layer. Bees would work lively for a day or two, and then the honey flow would appear to cease. I shall have about 1,500 lbs. of surplus this season; shall have several hundred pounds of comb honey; have had to extract considerable from sections on account of not being filled out. There has been but little surplus honey in this neighbourhood, owing somewhat to want of care given to the bees.

In the southern part of the State bees have fared worse. One bee-man in Ventura county tells me that he has 400 colonies of bees. He built 1,000 hives last winter and filled them with foundation, piled them out-doors ready for swarming, will lose one-half his bees by starvation, and had no increase by swarms at all. The general complaint, through the southern part of the State especially, is that bees are starving. The cold weather and late wet winter kept the flowers from blooming. The white sage, on which they depend, was almost an entire failure. The flowers of this section, forty-five miles north of San Francisco, are different, and I think of more variety than that part of the country. We had not so much bloom as we generally do, but we have not so many heads of stock as they do. It looks as though there might be a conflict between the herders and bee-men in the future, though in time, when the country becomes more settled, the stock will be more scarce. This part of the State is more settled and wild land is scarce; we naturally have more water. Our best season is when every other part of the State is suffering from drought. Napa Valley never fails entirely of a crop, and is considered sure.

I think if the same interest was shown in this section, that the honey would make a better showing. The honey, except in the

valley, has a better flavour, and is more like the eastern honey. I have heard of a few cases of foul brood, but have never seen it; am entirely free from it, and know but little of moths from experience.

I use the extractor and comb foundation. I use pure wax, which can be bought here for 27c. to 28c., and am not troubled with sagging; have had it built out in three days; out of 50 or 60 colonies have had only some 5 or 6 frames of comb to break down from any cause. I conclude that the few cases were from having foundation filled with honey too soon after being built out instead of having brood, but it has given no trouble. When I find a comb broken I slip on transferring wire to top of frame, push in lower part under the lower-bar on both sides, and take it up, bees and all, without trouble, after removing comb on each side if necessary.—J. D. ENOS, *American Bee Journal*.

DEPRIVING BEES AT THE FALL.

BY A LANARKSHIRE BEEKEEPER.

BEFORE entering fully into the above practice I shall give an outline of the normal state of the hive in general, as it is commonly found during the months of August and September. I have chosen August, as it is the month, in our locality, that honey storing in a great measure ceases; or, in other words, it is only in exceptional years that any honey is stored in that month with us, but in other localities it may be protracted or extended beyond that period.

That bees are economists to the greatest extent none can deny. When a hive is examined, say, in the middle of August, we find the sealed honey (which is always the last to be touched by the bees) at the top and outside combs, the brood gradually receding to the centre, from whence it will start in the spring, circumscribed by stored pollen, much of it preserved by being covered with honey, while all of it is thoroughly mixed with that ingredient—a natural consequence, for without honey in the bees' sac they could not collect it. By the end of the month stated most of the brood will be hatched. The brood nest is now often limited to two or three patches about the size of a man's hand. The queen, however, to all appearance, relaxes little in her laying, but the eggs are often removed by the working bees. By the month of September the queen becomes less bulky, and, unless in the case of a young queen breeding, has ceased, September being the quiescent month. At this stage little unsealed honey exists, and the combs are perfectly dry. They should be maintained in this state by insensible upward ventilation—a discovery first given to the world by a Renfrewshire beekeeper, the Rev. Mr. Longstrath, and myself, about sixteen years ago, and now universally adopted. My own announcement of it appeared in the same number of the *Journal of Horticulture*, together with that of the first-named excellent and able correspondent to that contemporary, describing how he had successfully tided his bees over the severe winter of 1862 by using India matting.

If the above has been properly attended to, the bees will survive the most severe winter unscathed. But let us return to the end of September. The bees, in most cases, will be taking the rest which nature demands, and creeping closer and closer together, forming a compact mass, in a semi-torpid state, keeping each other warm—in which state they remain for three or four months, unless the weather is so very mild as to invite the bees out for an airing, and to discharge their feces; after which they return to their hives, to resume their winter rest, but keep up a continual hum, loud or low as the cold may be, only to renew their wonted activity on the coming of the aconite and snowdrop. And as the stores of the hive will be ample, there will be no inducements for the bees, beyond the few flowers, which they soon rob of their pollen, to fly much abroad, and so cause unnecessary wear and tear. They remain, comparatively speaking, young bees from September till April, when the willow sends forth its catkins, and the gooseberry its blossoms—beginning then to breed in earnest. Eggs at the rate of from two to three thousand daily, or even more, are laid, and deposited in the cells by the queen, and by her alone. The fact that 3,000 eggs are laid daily is a good criterion to decide what size the hive should be for breeding

purposes. It should not have less than from 15,000 to 18,000 superficial inches of comb, while a proper hive should be elastic, so that it can be extended to any size. Different sizes of hives have been recommended, but those capable of extension or contraction at will are the proper form of hive to use. Mr. Pettigrew, in the *Journal of Horticulture*, advised that a good size was 14 in. by 18 in., or 18 in. by 14 in. It will be observed in the above case, although it sounds well, that it is as amusing as are many of that writer's assertions, because, when the figures are inverted, there is about a quarter of difference in size.

But to return to the subject of feeding. The hive that has stores of its own remains in a great measure in a quiescent state until February. Although brood may often be found in the hive in the very coldest of weather, it is not a sign of prosperity. For a period of over thirty years our best hives were those that never required feeding, the bees being kept in a young state till the spring. Mr. John Hunter stated lately in the *Journal of Horticulture* that "bees bred in September were all dead by April." This is so far from the fact in our case, as proved by actual observation, that I take this opportunity of entering my dissent. In 1877 there was not a bee hatched after August 1, nor did they commence to breed until some time in March, when pea meal was given; and by the month of July, 1878, they assisted to fill the supers, in some cases amounting to 200 lbs. Again, in August, 1878, I joined imported Italian queens to six stocks, and in July of this year many of the old bees were alive and active. But, on the other hand, bees that are born in April as a rule may be said to be all dead by July or August; but hives that are deprived of their honey in autumn, and then fed, are neither so long lived, nor are they so profitable, which I will endeavour to show to your readers in my next.

If bees have a store of food of about 18 lbs. of their own gathering and the usual store of pollen, it is of more consequence to a hive than twice the weight of sugar. The latter, however, is usually irretrievably destroyed at the depriving. When a hive is deprived of all its stores in September, starting anew to replenish the hive by artificial feeding excites the bees to a much greater extent than the season demands; and, between the aggressions on the one side and defence on the other, the hive is kept in a continual state of ferment, and in about two weeks afterwards, in most cases, not more than one-half of the bees are alive. It is true, theorists tell us that to feed bees is to encourage breeding, but never to the extent of the loss; while, with the continual worry, they soon become old bees, and few will be living when April comes. Then it is a fact not to be overlooked that bees hatched in October seldom get an opportunity to take an airing to discharge their infant feces; distension follows, more meat is consumed, and a coldness creeps over many of the bees, robbing the calorific from those unaffected; they in turn soon get similarly affected, dysentery ensues, and the hive becomes in most cases worthless. October-hatched bees are the most dangerous to a hive, because they have the whole winter before them; bees that may be hatched in December or January often get an opportunity to fly in the last named month.

Feed bees as you will, they always leave a great part of the comb unsealed. This renders the hive damp and more susceptible of cold than a hive in its natural state; it also brings on distension in spite of every precaution.

Neither, in my opinion, is sugar fit for bees in winter, nor for raising young bees with, when it can be avoided. I know that many will laugh at this assertion—modern beekeepers particularly so; but I can afford to let them do so. So far back as 1860-61 and 1862, all as bad years as 1879 has been, bees had in many places to be kept alive by feeding; but the last-named year revealed the truth. Many hives died through deterioration of constitution. Simultaneously with the late lamented "prince of apiarians," T. W. Woodbury, I had a number of hives that died through constitutional weakness—what that gentleman styled dropsy. The stocks affected were those that had sugar-bred and sugar-fed queens. The year 1877 was in a great measure no better for bees than this has been. Many hives had to be fed while queen-rearing was going on, and it is a fact that every one of these hives died in the following spring from the same disease. This year I had numerous inquiries regarding dwindling hives similarly affected, and on inquiry was told they were sugar raised. No doubt those situated more south than we are may not be subjected to the same loss; but my argument is to avoid that which deteriorates, even though it be but slightly. In my next article I will give further proof of the danger of feeding.—*Farm Journal*.

ADVICE FOR THOSE WHO ARE THINKING OF COMMENCING BEEKEEPING.

WE quote the following in this place, and not under "Foreign Notes," that it may the more readily attract the eye of those of our readers who are only thinking of starting an apiary. We have so many inquiries as to the amount necessary for first outlay that we are glad to add to the advice we have already given by post to our applicants the words of so celebrated and successful a bee-master as Mr. Doolittle. As we have already told some of our subscribers, it is easier to mention a maximum than a minimum outlay. Where a rich person can afford to buy hives at several guineas each a cottager or labourer can only spend as many shillings. But to each we say, do not try too much to begin with. Try at first what you can do with a few hives, and you will then know whether you have opportunity and ability sufficient to manage several.

The following is taken from the close of an article by Mr. Doolittle, in the *American Bee Journal*:—"I wish to say a few words to beginners, and perhaps they may apply to some who have kept bees several years. Don't pay out more than 40 to 50 dollars to get a start, including bees, hives, periodicals, books, and everything. If you do not buy more than from two to four colonies (and you should not buy more), this will cover all necessary expense. Make your own wares, except a sample, perhaps, to work from, and thus save money and become self-supporting. Make your bees and yourself self-sustaining, and after the first start do not pay out for anything more than what the bees bring you in, always remembering that if you cannot make four colonies pay you cannot four hundred. If you should happen to make a failure of the business you will have the consolation of knowing that you have lost from 40 to 50 dols., instead of from 300 to 400, or perhaps as many thousands, as some do. Also remember, if you wish to succeed you must look after your bees. If any person expects to realise a large income from his bees and never look after their condition (simply hive them and put on boxes), he will find himself greatly mistaken. How many who read this know the exact condition of their bees at all times? If you do not, my friend, you are not caring for them as well as you would for your cow or horse; neither can you expect any more profit from them than you could from a cow or horse if you never looked after it. Beekeeping only pays when our pets are properly cared for, and if any one cannot spend the amount of time on them they require he had better keep out of the business, for sooner or later he will turn away from it in disgust."

HONEY SEASON (1879) IN DENMARK.

By J. G. Wood, Vice-President of Danish Bee Association.

WERE rain and flowers all that are requisite to ensure a good honey harvest, we in Denmark could have boasted of such in the past season; but, fortunately, the genial warmth of sun is necessary, otherwise there is no honey secreted in any plant, not even the busy ant is able to obtain its food as honey dew on the leaves.

As compared with the last twelve to fifteen years, this season, taken in general, has been the poorest honey season in Denmark. During the early part of the season there was every prospect of its being what might be called an average one, but as time wore on even the most sanguine began to despair. Swarming period arrived, though late, with no improvement, and it was soon evident that if there was to come a trifle to the beekeeper's profit, it would be before the heather bloomed, and thus only few would be the reapers, these being the users of frame hives, which, on the heaths, are in the minority. Previous to the heather coming in flower it was whispered in many places that even old stocks were dying of

sheer starvation, swarms were already at the starvation point in the middle of June, and many died a little later. This was one grief, but a worse followed. The mother colony of many of these swarms also were lost owing to the young queens not being able to fly out and pair; others when out were lost in their wedding flight, being overtaken by heavy storms, and becoming prey for the birds. The continual moist weather was uncommonly favourable for the forthcoming of midges or gnats; in some districts the number of these were so enormous that they appeared as small clouds, and, in some instances, appeared in columns of seventy feet high, and of a considerable diameter, plainly to be seen at the respectable distance of a thousand feet or so; and where midges are in abundance there find we our welcome summer visitor, the swallow. That our favourite bee fell a prey to them there was no doubt, and how could a mother-swallow refuse or refrain from securing such a fat, dainty morsel for her young as a young queen, for example, that happened to be enjoying her honeymoon? That many were lost in this way was certain, and the loss thus by storm and birds has been double, I might say, the number of young bees hatched; and the result is that apiaries usually giving an average of fifty to sixty pounds per hive this year have not given a pound; but, on the contrary, required the aid of about 150lbs. of candy for every twenty colonies to carry them barely over the winter months. In the heather districts the result has been a little more favourable, as the weather cleared up a little at the time the heather bloomed, giving a result in many cases of twenty to thirty pounds per hive, and in exceptional cases higher. The general expectations were that honey would rise in price, but such is not discernible, owing partly to the average heather harvest, and partly to the surplus of last year, which in many cases has been kept in stock, the cold weather during the summer being very favourable to its keeping so well without fermentation taking place.

There is not the slightest doubt but that the past season will have not only thinned the number of bees, but also, I may say, decimated the colonies by loss of queens alone. The result, of course, will be in spring a heavy falling-off in the ranks of beekeepers who by last year's good results were expecting to advance, but by this year's work will have come to the conclusion that the keeping of bees is not always sunshine with profit. The more hardened say, "Make the best of it," but above all winter well for the coming year.

HOW TO PRESERVE LARVÆ.—The larvæ are killed and the intestines removed, but, before killing, keep the larvæ without food for a couple of days, as if operated upon whilst full of vegetable matter it leaves a black stain just behind the head, which spoils the look of the larvæ. In preserving the skins, a glass tube bent is used, and drawn to a fine point, the upper side of the point being straight. The skins are held upon the tube by means of a fine steel spring, tied to the tube; they are then blown out with the breath and dried over the flame of a common paraffin lamp, care being taken to keep them distended with the breath whilst drying. The bend in the tube is to prevent any moisture from the mouth entering the skin; when quite dry they are easily detached from the tube and mounted with gum upon stems of grass or twigs. The hairy larvæ are soaked previous to drying in alum and water to keep the hair from falling off. To test when properly dried, the air has only to be exhausted from the tube, and the part of the skin not dry immediately doubles up. This is a simple method, and necessitates the use only of the one tube.

INTELLIGENCE IN ANTS.—Whilst weeding in the garden last August, I broke open the upper galleries of a nest of small black ants, and in so doing scattered a number of eggs, which had been carried up from below, that they might be warmed by the sun, which at the time was shining brightly. As I watched the ants gathering them into the nest, I noticed a little fellow dragging one, two or three times larger than himself, up what must have seemed to him a very steep hill; at last he stuck fast, and, after a few plucky efforts, he left the egg, made a few casts round the ground to see how the "land lay," and then returned to the egg, which he pulled up an easy ascent, of which he had been in search, and which was in quite another direction to the one in which he was going when he stuck fast.—THOMAS WINDER, Sheffield.

OUR MONTHLY PRIZE ESSAYS.

Competitors should bear in mind that these Essays are intended for the *novice*, and not for the accomplished Bee-master. The style must, therefore, be as simple as possible. Technicalities should be avoided; but when their use is absolutely necessary an explanation should accompany them. *Take it for granted that the readers you are addressing know absolutely nothing of the subject.*

The Monthly Prize Essays will appear in the pages of the "BEEKEEPER," but the Proprietors will, when they think fit, publish them in a separate form for distribution.

RULES FOR COMPETITION.

1. Competitors must be Subscribers to the "BEEKEEPER."
2. All Essays must be legibly written, and on one side of the paper only. They must bear a distinguishing motto. A sealed letter must also be sent bearing on the outside a similar motto, and containing the full name and address of the writer, which will in all cases be published.
3. Essays to be returned in case of failure are to be accompanied by stamps for that purpose.
4. The Essay for which the prize is given will become the property of the Proprietors of the "BEEKEEPER."
5. Essays are not to exceed 3,000 words in length, but may be less if the competitor so desires.
6. Essays must be sent to the Editor of the "BEEKEEPER" not later than the first day of the month for which they are intended.

DECEMBER AND JANUARY.

The Prize for December will be £3 3s., and that for January a like amount. The first should reach us not later than the 8th of December. All others should reach us not later than the first day of the month for which they are intended.

SUBJECT FOR DECEMBER.

"STARTING BEEKEEPING."

In dealing with this subject the case of a cottager or other who owns only old-fashioned straw skeps, and who has no opportunity of obtaining better hives before the spring, should not be lost sight of.

SUBJECT FOR JANUARY.

"HOW MUCH DO BEES DEPEND ON THEIR POWER OF SIGHT?"

We choose an article pertaining to the scientific side of bee culture to encourage apiarists to study the deeper part of the question during the slack time of winter.

SOME OPINIONS OF THE PRESS ON THE "BEEKEEPER."

(A further selection will appear in our next issue.)

[*Echo*, Nov. 12.]

THE BEEKEEPER, an independent monthly journal of practical apiculture, has just been started. The first number is interesting and suggestive.

[*Globe*, Oct. 25.]

The first monthly number of *The Beekeeper* has just been published. It is intended to promote and improve bee culture by furnishing a means for the interchange of information useful both to the novice and the experienced apiarian.

[*Agricultural Gazette*, Nov. 10.]

THE BEEKEEPER.—The first number of what promises to be a capital monthly publication (price 7s. a year) has just reached us. It is full of most valuable, and interesting, and various information. What a curious blot is that which it hits in the official instructions for the inquiry by the Royal Agricultural Commissioners! The honey interest of America is especially included in the inquiry, while that of Great Britain is excluded from consideration!

[*London Figaro*, Nov. 12.]

A new monthly journal devoted to "practical and scientific apiculture" has been started under the title of *The Beekeeper*. It is excellently printed and got up.

[*Truth*, Nov. 6.]

THE BEEKEEPER is a new monthly journal about bees that has been sent to me, and as I always intend to buy myself a hive, and to make that enormous fortune which one is always told awaits its fortunate proprietor, I mean to take in this periodical.

[*Birmingham Daily Post*, Oct. 22.]

THE BEEKEEPER.—The subject of beekeeping has lately received an increased degree of attention, and there is room for a far larger development of the pursuit. This is likely to be helped by the publication of a monthly journal called *The Beekeeper*, of which the first number has just been published. The serial appears to be in very able hands, and is intended to promote and improve bee culture by furnishing a means for the interchange of information useful both to the novice and the experienced apiarian. The first number extends to thirty-two pages of interesting matter, and should those to follow be of equal merit the publication has every promise of success. It is published by Mr. E. Rossiter, 1, Catherine-street, Strand, W.C.

[*Hull Packet and East Riding News*, Oct. 24.]

THE BEEKEEPER.—We have received the first number of this admirable paper. As its title implies, it is written in the interest of apiarians, and its object is to disseminate information respecting bees, hives, and honey, and to promote beekeeping. All the articles are well written, and written for various classes of readers. One peculiar feature of the journal will be a scheme of monthly essays, for which prizes of the value of £3 3s. will be awarded. The competition, of course, is only open to subscribers, and the subject for November is on "Wintering Bees." The future numbers will contain articles on poultry, &c.; and when it is remembered what a great demand there is for the products of the hive and poultry-yard, and the necessity of as much information on the subject as is possible being disseminated, we cannot but think *The Beekeeper* is likely to prove very useful, not only to amateurs, but others more experienced.

[*British Press and Jersey Times*, Oct. 23.]

THE BEEKEEPER.—We have received the first number of this journal, which is published at 1, Catherine-street, Strand. Devoted to practical and scientific apiculture, this monthly promises to supply a great want. Bee culture is undoubtedly an industry which is at present only in its infancy, and its promotion is the object aimed at by this journal. The first number consists of thirty-two pages of interesting matter.

[*Grantham Journal*, Nov. 1.]

THE BEEKEEPER is the title of an "independent monthly journal of practical and scientific apiculture," the first number of which was published on October 15. The people of Grantham and neighbourhood are supposed to take a very lively interest in the progress of apiculture, because of the establishment of a most successful Beekeepers' Association in their midst, and we have therefore

much pleasure in directing attention to this new periodical, especially as the appearance of the first number is in all respects creditable. With the generous support of the public, *The Beekeeper* ought to perform a very useful and important work.

[*The Bucks Herald*, Oct. 25.]

The first number of a newspaper called *The Beekeeper*, an independent monthly journal of practical and scientific apiculture, has appeared. It seems likely to be a useful means of communication among beekeepers, and the number contains a large quantity of interesting matter having special reference to beekeeping, and also some useful notes on the garden and poultry.

[*Hampshire Chronicle*, Oct. 25.]

THE BEEKEEPER, an independent monthly journal of practical and scientific apiculture, has been started, its object being to promote the cultivation of bees and the production of honey, and to afford assistance to the British Beekeepers' Association, which is acknowledged to have done good service in the work it has undertaken to perform.

[*Wellington Journal and Shrewsbury News*, Oct. 25.]

BEEKEEPING.—A good deal of matter has lately appeared in the columns of this journal respecting beekeeping, and some valuable hints have, we think, been given by the various gentlemen who have written on the subject for the guidance of the inexperienced in this pleasing, profitable, and, we are glad to believe, increasing industry. The consideration, too, of how best to attend to the wants of the bees just now, after their past exceptionally bad season, and the necessity for useful information and reliable instructions to those who have a practical interest in bee culture, all combine to make the appearance of *The Beekeeper*, an independent journal of practical and scientific apiculture (Rossiter, Catherine-street, W.C., London, publisher) particularly opportune at the present moment. Judging by No. 1 of this new periodical, it will doubtless be found to be a very useful guide, and a well-compiled publication, containing much of value and importance to all classes of apiarists.

[*Wellingborough and Kettering News*, Oct. 25.]

We have received a copy of the new periodical entitled *The Beekeeper*, the first number of which was issued on the 15th inst. Beekeepers will find it invaluable. The journal is well written and full of instructive and profitable information. We extract one article entitled "A few proofs that the bee was intended to be domesticated by man."

[*Jersey Express*, Oct. 25.]

The first number of a new literary venture intended to represent the interest of apiarists has been forwarded us. *The Beekeeper*, the title of the new monthly (E. Rossiter, 1, Catherine-street, Strand), appears to have had a fair start and contains some capital and valuable hints to persons who keep these useful little insects for either pleasure or profit, or for both. Besides this *spécialité*, *The Beekeeper's* columns are open to advocate the claim of poultry breeders. The present number contains several articles ably written on the topic which forms the basis of the periodical.

[*Midland Gazette*, Nov. 8.]

THE BEEKEEPER: An Independent Monthly Journal of Practical and Scientific Apiculture. London: Edward Rossiter, 1, Catherine-street, Strand. The principal object in issuing this very useful work on beekeeping is to show a plan by which any person, be he the owner of one hive or of hundreds, may at any time find a ready and profitable sale for honey. *The Beekeeper* occupies thirty-two closely printed pages, and contains every possible information in reference to the keeping and management of any quantity of bees, with all the modern appliances which the various writers have gathered from long experience. All interested in bee-culture should at once secure a copy of this excellent work *The Beekeeper*; it will amply repay the purchaser and enlighten him on many subjects which hitherto have appeared mysterious.

[*Hampshire Advertiser*.]

THE BEEKEEPER, the first number of which has been sent us, is fully described as an independent monthly journal of practical and scientific apiculture. Its object is a most useful one, being to promote the cultivation of bees and the production of honey, and to afford assistance to the British Beekeepers' Association, which is acknowledged to have done good service in the work it has undertaken to perform. It is a pity that so much money goes out of the country for foreign honey, when a little more energy at home would render us almost, if not quite independent of other countries.

SPECIAL NOTICE

TO

ADVERTISERS.

THE value of THE BEEKEEPER for advertising purposes, as the only independent paper of its class published in the United Kingdom, must be self-evident to those having commercial dealing with apiarists. It would, therefore, be waste of time and space to enumerate its claims to their support.

We are now addressing those Advertisers in particular who may wish to bring themselves before the notice of our readers at trifling expense; and in order to meet this want which from letters received and advice tendered is clearly much felt, we offer a space, the size of that at the foot of this notice, including free copy of the paper, for £3 3s. per annum, conditionally that the order be for not less than 12 months, and that the same shall be paid for quarterly in advance.

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CONTENTS.

	PAGE.
Our Monthly Prize Competition...	33
Wintering Bees	33
Wintering Bees	34
A Professor of Apiculture	36
Pollen as Bee Food	36
The Bee (No. II.)	37
Foreign Notes	38
Age of Bees	38
California as a Beekeeping State	38
Doolittle's Report for 1879	39
Lots of Bees and Chaff Cushions	39
Report from an Apiary run by Hired Labour	39
Honey Vinegar	39
What is Royal Jelly?	39
A Reply to the Foregoing	40
Effects of Etherisation on Bees	40
Etherisation	40
How Bees Mark their Location	40
What is the Best Mode of Springing Bees?	41
Queen Rearing and the Improvement of the Honey Bee	41
Hope for the Depressed	41
Do Workers Lay Drone Eggs?	41
Bees in Australia	42
Hints on Wintering Bees... ..	42
Honey in England	43
A Lecture on Bees	43
Cures for Stinging... ..	45
Correspondence	46
The Month... ..	47
Our Extra Prize	48
Instructions for Beginners (No. II.)	48
The Garden	49
"It's an Ill Wind," &c.	50
Poultry	51
Notes and Queries	53
Austro-German Congress... ..	54
The Scientific Value of Microscopic Preparations	54
New Mode of Transferring, &c.	55
Depriving Bees at the Fall	56
Advice to those who are Thinking of Commencing Bee-keeping	57
Honey Season (1879) in Denmark	57
Our Monthly Prize Essays	58
Some Opinions of the Press on the "Beekeeper"	58
Special Notice to Advertisers, &c.	59

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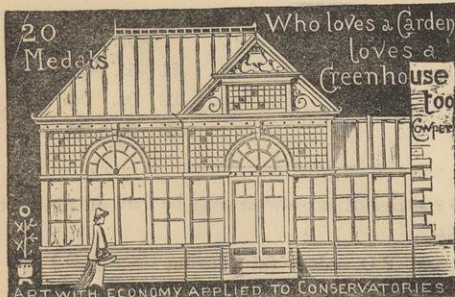
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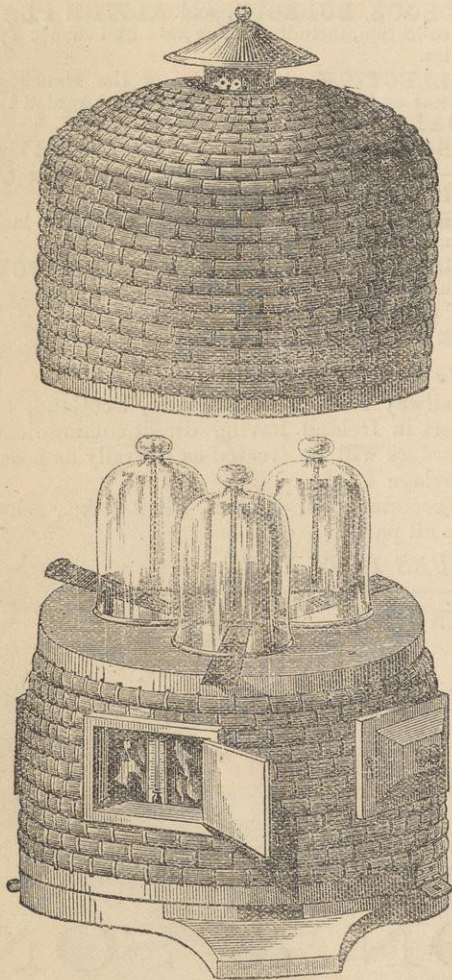
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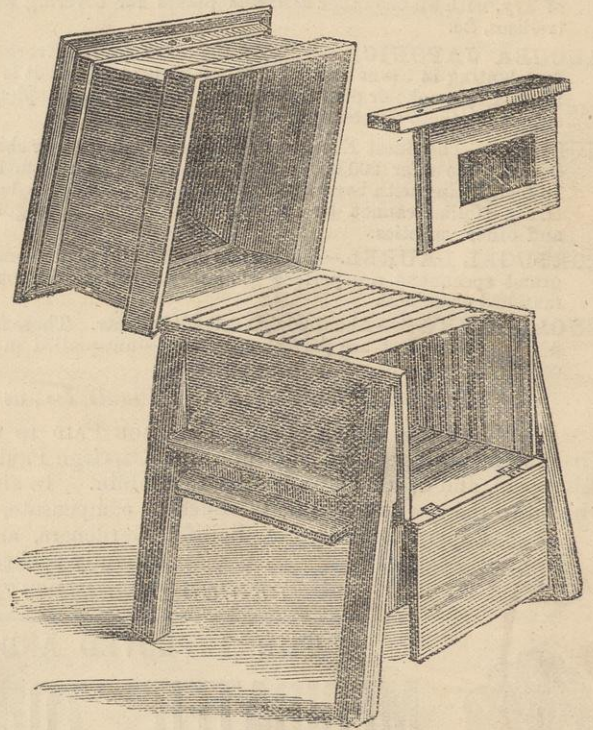
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