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THE BEEKEEPER:

AN INDEPENDENT MONTHLY JOURNAL OF PRACTICAL AND SCIENTIFIC APICULTURE.

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THE BEEKEEPER:

AN INDEPENDENT MONTHLY JOURNAL OF PRACTICAL AND SCIENTIFIC APICULTURE.

TO OUR READERS.

We have to apologise to our readers for the delay in bringing out the present number of the Beekeeper. We hope we may for this once ask for their indulgence especially as we can assure them that we shall take every precaution to avoid any such delay in future.

Any subscriber who does not receive the Beekeeper regularly will oblige us by writing to Mr. Rose, 1, Catherine-street, Strand, W.C. There have been several complaints made, but our fresh arrangements will prevent any cause for a recurrence of them.

Until further notice all letters for the Publishing Department should be sent to George Rose, and all Post Office Orders should be addressed to him and made payable at Somerset House Post-office.

Copies of No. 1 are so scarce, being all but out of print, that we can sell no more of the October number singly, but must reserve them for regular subscribers. We will gladly exchange a current number for every copy of the October number returned to us.

In our next number we intend to commence a reprint of the works of the Old Bee Masters. These will be arranged so that, although the different parts will be for the present stitched with the Beekeeper, they can be bound either at the end of each volume of our Journal, or as an entirely separate work. Each book will be provided with a distinct title-page and have its own pagination, and we shall take great pains to give an exhaustive index. At the end of each work we shall print copious notes, taken from the Philosophical Transactions, the Transactions of the Linnæan and other Societies, and from the writings of other bee-masters, together with extracts from co-temporary reviews; and in most cases we shall commence the work with a brief biography of the writer. It is one of our aims to promote a more scientific study of apiculture than beekeepers, for the most part, seem to think necessary, and we believe that this arrangement will meet the wishes of the greater number of our subscribers. We shall commence with François Huber's celebrated work "New Observations." We begin with this not because it is the first in chronological order, but because we think it is, without exception, the most important work ever written on the subject of the Bee.

We have already given much space to "Foreign Notes," but in future numbers we shall have several more foreign periodicals from which to gather information for the greater benefit and pleasure, we trust, of our readers. We also carefully watch the English papers, London and provincial, and hope no one will complain that we "crib" too much. Our desire is to obtain information from every quarter and to spread it. We always give our authority and "humbly acknowledge where we got it from."*

We take this opportunity of repeating that we are very thankful to receive any suggestions for the conduct of the Beekeeper, for we are anxious to make ours a pattern paper.

For want of space we are obliged to omit in the present number the continuation of the articles on "The Bee," and "Instructions to Beginners."

OUR PRIZE ESSAY.

STARTING BEEKEEPING.

By John Geddes, Gardener.

Following the plan adopted by Mr. Raitt in his excellent essay on "Wintering Bees," I divide the subject into different heads. Of these I propose to consider three:—Who should start? When to start? How to start?

I.—Who should Start.

For the purposes of this essay I may safely take it that all beekeepers belong to one of two classes—the professional and the amateur. By the professional, I mean the man who looks to his apiary for either his sole or part of his means of subsistence. The amateur is he who considers beekeeping a hobby which will afford him amusement and may gain him some profit. To put it in another way, the professional can and will give all the time and attention required by bees; the amateur either cannot or will not do so. To the former class I think all farmers *should* belong. To the latter any man in town or suburb who has the necessary ground *may* belong. It is necessary to make this distinction, for instructions suitable to the amateur will not do for the professional, and *vice versâ*.

I need not enter into the question, "Who may become an amateur" (in the meaning used by me for present purposes), for such papers as the Beekeeper, "Mr. Abbot's Journal," the "Horticultural," &c., ought to, and I hope will, find many recruits to the science. Suffice it to say that agricultural labourers, railway servants, country and suburban gentlemen, gardeners, nurserymen, and many others would find the pursuit an instructive and amusing, if not a profitable one.

II.—When to Start.

(*a.*) When you have resolved to have patience and perseverance.

(*b.*) When you have made up your mind to which class—amateur or professional—you will belong.

(*c.*) When you have acquired some knowledge of the subject. This may be done by consulting some of the many manuals on beekeeping which have been published. Bee periodicals are recommended by many, but I cannot conscientiously recommend them for a beginner. Too much time is lost and too much confusion acquired in reading matters intended only for the more advanced. Above all watch carefully, whenever you can, other beekeepers. One hour with a good beemaster is worth twenty hours' chamber study.

(*d.*) When you have determined what object you will hold in view in your beekeeping—*i. e.*, whether your object shall be honey-in-the-comb collecting, run or extracted honey collecting, swarm getting, or scientific study of the natural history of bees and the mysteries of the hive. This

* Col. Pearson (of Nancy, France), writing to a contemporary, suggested that we, the Beekeeper, should print Mr. Cowan's paper on "Wintering Bees," and "humbly acknowledge where we got it from." Our conscience tells us that we always acknowledge authorities, and so we presume he meant the phrase for a gentleman to whom his letter was addressed, and whom he had just charged with adopting as his own an invention of someone else. We should have printed this paper but that we had already two essays on the same subject. Mr. Cowan's paper was worth reading.—Editor.

is a most important point, for each of these pursuits requires a different *modus operandi*.

(*e.*) Make up your mind to what maximum of expense you intend to go, and do not be tempted to exceed it.

(*f.*) At what season to start almost requires a separate heading. There are three seasons — Spring, Summer, Autumn and Winter. Each has its advantages and each has its drawbacks.

1. Spring.—There are more advocates for spring than for other seasons. The first advantage is that bees bought in spring, say in March and April, must, for the most part, have lived through the winter, and the cares and anxieties of winter will have been borne by someone else than the new owner. But the bees will be old and drawing near the end of their lives. A beginner must, therefore, be careful that as the old bees become extinct there will be new ones to take their place. The bees must, therefore, be both numerous and healthy—healthy to ensure plenty of brood, numerous to make sure that care will be taken of the brood. It is better, therefore, to watch the hive for a day or two before you purchase it, for you will (with the help of your manual) soon know whether the bees are as they ought to be.

Another advantage in spring purchasing is that for the first few months you can afford the time to watch and study your bees. The beekeeper's labour for the winter is over, and his work for the honey season will not yet have commenced. This is a very great advantage, and should be made the most of.

One advantage more is that in a month or two you may expect your bees to swarm, and you ought then to have two colonies instead of one.

Still another advantage is that by buying in early spring you may, if you wish it, remove your bees from one hive to another without their losing any chance of honey gathering.

A drawback is that in spring people are less inclined to part with their bees than at other times, and they also want more money for them—for honey will be coming in and no money will be going out.

As we are now in the winter, and are some three months from the spring, I cannot do better than recommend everyone to start in spring. Three months is a nice time for reading and studying—it is too late to buy now—and it will be a pity to waste the spring and wait for the summer. If for no other reason, then, I think spring will be the best for those I am at present addressing.

2. Summer.—By the summer I mean May and June. This is the swarming season, and in many country places swarms may be had very cheap. The advantages are that you can see what you are buying, you have no fear of bad combs or foul brood, and you can, without loss of time, place your swarm in any hive you like. The disadvantage is that you have wasted much of the honey season. The beekeeper who starts with a view to scientific investigation may find an advantage in buying at this season, for he will be able to see the bees begin at the beginning.

3. Autumn and Winter.—An advantage in buying at this season is that many people—too many—will as soon give their bees away as keep them, and they may be had cheap. The past season (1879) saw many cases of this kind—beekeepers were disgusted with the paucity of the honey gathered and dreaded the expense of feeding for the winter. The argument cuts both ways, however, for colonies will be scarce in the spring, and more money may be had for them than is usually required. There is some risk in purchasing at this time, for those who have so little care for their bees as to wish to get rid of them will most probably leave them in a weak, unhealthy, and altogether unsatisfactory state. This can be ascertained by the weight of the hive, which, with provision of honey or syrup for the bees' food during winter, should not be less than 25 lbs.

How to Start.

To enter into every detail that should be mentioned under this head would far exceed the limits of this essay. In the following remarks I am taking for granted that you have decided to purchase a stock of bees, with hive complete, in the spring. There are certain precautions that must be taken.

If possible persuade some friend who understands bees to accompany you when you go to make your purchases. He will notice the bees as they enter the hive, and will be on the look out for pollen gatherers. This will be a sign that there is some chance of an increase of numbers of bees in the hive. He will examine the hive to see if the combs are in good condition, having plenty of sealed brood and many worker cells. He will also be most careful that there is no "foul brood"—the greatest dread of the beekeeper. Any offensive smell, any cells with collapsing or sinking lids, any sign of rotten larvæ will cause him to have nothing to do with that hive, or with any other in the same apiary. Careful enquiry must be made as to the age and condition of the queen bee, and he will reject the colony if the queen bee was not one of the previous year. So, also, will he reject it if the bees are not numerous. I say he *will* do all this. I should rather say he *ought* to do it if he really looks after your interest.

You must be careful only to purchase at some distance, say a mile, from the place where you intend to keep your hives.

Having had your colony sent home, it is generally best for a beginner to leave the bees in the hive in which you receive them, that no time may be lost by them in rearing the brood. Wait until the hive has swarmed, and then put the swarm into any hive you think proper. You will thus have two colonies instead of one, and the old one can always be kept as a stock or rearing hive, of which there should always be, at least, one in an apiary.

After your bees arrive you will have but little to do until the swarming takes place. As you ought to have learnt before you start beekeeping the signs which show that the bees are about to swarm and the treatment they will then require, I shall say nothing on that subject here.

I have said that you must make up your mind about your object in keeping bees. Do you desire honey in the comb? Do you wish for run honey? Do you intend to increase the number of your colonies? Do you wish to observe only?

Each of these pursuits requires separate study and separate management. There are, however, a few maxims that hold good for all, of which I mention but one. Above all things do not try for too much at once. You should be satisfied with doubling or, at the utmost, trebling your number of colonies in the first season. If you try more you will most likely find you have undertaken too much, and

you will also soon learn that your hives are weak, and that one strong colony is worth several poor ones.

The style of hive you require depends entirely upon what you want it to do for you. And you should remember that where a hive for some particular plan of operation will do very well in one place, it may require modifications and alterations before it will suit another. You must, therefore, not only make up your mind what you are going to do, but must also consider the aspect and resources of the neighbourhood where you intend to set up your apiary. The best plan is to visit those of your neighbours who already keep bees, see what hives they use, and inquire into the amount and mode of their successes, not forgetting to ask also about their failures. By this means you ought to become quite decided upon the plan for your own operations and be well prepared for it.

Your first thought will be, "What bees shall I procure?" This you should decide for yourself, consulting the books which will teach you the advantages and disadvantages of the different species. If you decide upon Italians you must also consider cost. If you choose blacks to begin with, having an intention to Italianise them at some future day, you will then have another item of practise and science to study.

Before getting your bees at all you must become acquainted with the arrangements, objects, and peculiarities of the hive you intend to use. One piece of advice only is necessary here—do not use several hives made on different principles, or you will give yourself much unnecessary trouble. One style of hive alone should be seen in each apiary, and one size alone of frames and supersections.

One of the first things that will claim your attention will be swarming. You will have to be prepared for the swarm when it comes, and unless you know what to do you will lose it. This shows that another branch of the subject should be well understood before you commence. With the help of bee manuals, and with the aid of advice from beekeeping friends, you can soon learn quite enough to make you ready for your swarm whenever it may appear.

Next, you will find that you must have some knowledge of the way of putting your swarm into a hive. This is presuming you have so far left your bees in the hive in which they were first brought you. If you wished to transfer them to another hive you must naturally have learned how to do it.

Suppose, then, that you have mastered your subject thus far—that you have managed your swarm and have safely hived them—you must now know what you can best do to help them, to save *them* time, and gain for yourself an earlier supply of honey or swarms. You must know what "comb foundation" is, and how to use it. You must understand how to detach or remove part of the comb from one hive and how to place it securely in another—an operation that is often very advisable. You must also be able to distinguish old comb from new, comb containing "worker cells" from that containing "drone cells," comb in which honey is sealed from that in which brood is sealed.

Later on, when your original hive gives off another swarm, or your new one does its first work in that direction, you will find it well to know how to unite these two swarms, or a swarm to a stock, a thing which must be done when your swarm or your colony is weak.

All these things you must know if you are going to let your bees work in, I may perhaps call it, a natural way. But there are other subjects that you must be acquainted with if you wish to make the most of your bees.

Thus, you must understand the difference between "natural swarming" and "artificial swarming." You must also know how to prevent swarming. You should also have some idea what to do when, joining two swarms or two colonies, you wish to save, and not destroy, one of the queens. For this you must know what a "nucleus" is.

Later on, when your hive is full of honey or brood, and you wish to obtain more honey, you must know the mysteries of "doubling," "storeyfying," "supering," &c. So also should you become acquainted with the use of the "extractor."

Then comes the business of "introducing a queen," destroying drones, &c.

Hardest work of all, perhaps, you must know from what enemies you have to guard your bees, how to keep these enemies from the hive, how to get rid of them when they have outwitted you, and how to repair their ravages when you *have* got rid of them.

Running through all these subjects you will find that a knowledge of the nature and anatomy of the queen, worker, and drone will be of great service to you.

It will be seen from the number of things I have mentioned that it would be impossible to give instructions about all in the limits of this paper. Any one subject alone could easily occupy twice the space of this essay.

What shall I deduce from what I have said? That starting beekeeping requires beginning at the beginning. Enquire first what you will have to do. Next, find out how to do it. Last, put your knowledge into practice.

To answer the enquiry what you will have to do, seek some beekeeper and find out from him. If that is not to be done, imagine yourself having some bees and not knowing where to put them. Read until you have mastered that point. So also can you imagine the swarm emerging. *Read!* You have a hive (imaginary) full of honey—how can you get the honey? *Read!* Read carefully, and when the time comes for practice you will be surprised at your own efficiency. Do not, however, imagine that you will become expert all at once. When you break down, as break down you must, consider closely what led to the failure, set to work again, have patience, and you will get on.

Do not think that you will have to study as hard as if you had two days to cram up for a Sandhurst examination. A little reading will tell you all that is *absolutely necessary* for you to know, but more study will help you considerably.

Should this essay be fortunate enough to appear in print I hope it will lead many to determine on

"STARTING BEEKEEPING."

BRITISH BEEKEEPERS' ASSOCIATION.

As mentioned in our last number (page 47), we wrote to the Hon. Secretary of the British Beekeepers' Association offering the help of our pages to appeal for subscriptions. We have received the following answer. We are delighted to find that the Association is in so flourishing a condition. We beg to offer it our heartiest congratulations :—

British Beekeepers' Association,

Abbot's Hill, Hemel Hempstead, Dec. 20, 1879.

DEAR SIR,—On my return home from Egypt, after an absence of some weeks, I have found your letter, dated November 11th. I am much obliged to you for the offer which you make in it, but I do not think that at the present time there is any necessity for an appeal to the public.—I remain, Sir, yours faithfully,

HERBERT R. PEEL.

CRITICISM.

A perusal of the first two numbers of the Beekeeper induces me to trouble you with this short paper, as you invite criticism when it is made in a good spirit, as, let me assure you, mine is. The American periodical, *Gleanings in Bee Culture*, has a column headed "The Growlery." Had the Beekeeper such a department my communication very likely would have been relegated to it, which position it doubtless deserves, and I think the future will bring forth many communications forming fit company, for beekeepers, like farmers, are sadly given to grumble.

In the first place I would speak of the "Personal" observations of the Beekeeper on page 16. I in common with many of my apiarian friends received the letter of inquiry, which we will term *a feeler*, and answered it, giving my candid opinion of the desirability of the proposed publication and the chances of its commercial success, which were unfavourable. I was one of the capital guarantors of the proposed bee journal of which you, Mr. Editor, speak, which fell through, not solely from want of sufficient capital, which could have been met, but from want of an efficient, qualified Editor, who was required to possess so many qualifications that the body of guarantors could not discover a gentleman able and willing to accept the post. Had such a paper been started there would have been no doubt of its independence. The reason your promoter gives for his opinion to the contrary evidently shows he is under a wrong impression as to the constitution of the body of guarantors, not a single one of whom was a *professional* bee-master, and, therefore, if jealousy existed, it could not be *professional* (*a*). In the course of my life I have dabbled in many hobbies and sciences, and in nearly all I have found, as soon as their votaries meddle with pen, ink, and press, somebody's jealousy is excited, and trouble begins. This was the root and branch of the feud which existed among the beekeeping fraternity, but which has happily now pretty well subsided, and I, at least, hope not to be the one to raise the storm again.

Bee-master is a quaint old term to which few people object, and it is an error to imagine exception was taken to that designation, but it was rather to *professional* bee-master used as above. I see nothing to be ashamed of in the profession of a bee-master; but a gentleman who occasionally sells his bees or his honey is no more entitled to that term than "my lord" who breeds and sells horses or cows, to that of a cattle dealer.

Before we dismiss the subject of jealousy—your address to subscribers managed to raise the yellow demon to a considerable extent, which was a bad start. Now, I'll be frank and tell you plainly how. The Committee of the British Beekeepers' Association is composed of the leading apiarians of the day (only one of whom is a *professional* bee-master, by the way) who have for years spent endless time and a lot of money, much out of their own pockets, for the sole purpose of promoting bee culture. They may be pardoned for thinking their time has not been spent in vain, and their experience gained is valuable. Here they find you, Mr. Editor, on evidently insufficient data, finding fault that there is no system, no organisation, no co-operation among beekeepers, while in a subsequent paragraph you admit to an immense amount of organisation, for the provincial bee associations are now numbered by dozens (*b*). Criticism is good, and the criticised, if he is wise, will receive it in good part, but it should be evident the critic is a master of his subject or his criticism becomes impertinence. You, Mr. Editor, were, in sporting parlance, a "dark horse" (*c*). No one knew you, nothing had been shown that your opinion was of any value, indeed it was thought that anyone who would believe that a South of England beekeeper could supply five tons of English honey, or that, if he could, would refuse 10d a pound, had little acquaintance with English beekeeping (*d*). You also appeared to be in blissful ignorance that the British Beekeepers' Association have already an organisation in hand for the collection and sale of honey, which they have; but I believe that theirs and yours will be failures (*e*).

Personally, I am glad to see a new bee journal, and wish it every success, towards which I will gladly give my help, and I think I may say in this many of my friends will join. With regard to selling honey, the American importations have fully proved what I have for years been asserting—that it only wants the English honey to be sent for sale in an enticing form and the market will be found at a market price, but to put such a price as you quote was done at Hemel Hempstead, viz, 2s. to 2s. 5d. per lb., is prohibitive. The same folly occurred notably at the Crystal Palace shows, the consequence being that all so priced was returned to the owners. If there is one thing more than another that has caused disappointment in beekeeping it is the gross exaggerated estimates of the profits that may be expected that certain writers have issued where bees are kept in poor and unsuitable localities, but the minimum of return must be expected. There are thousands of places in England where stocks may be kept with good paying profit, such as should be a great help to men of small earnings, such as agricultural labourers, railway servants and others, and rich or poor may derive pleasure, instruction, and profit from the labours of the busy bee. I have before me a note book of a working man, intelligent, industrious, and a lover of the bees. He has developed into one of the most successful beekeepers in the kingdom, and his experience is a good guide as to what may be expected under favourable circumstances. At a future day I will give his results to the readers of the Beekeeper.

The wisdom of your rule that all letters you insert must bear name and address of the writer is open to doubt. That the Editor should know his correspondents is good, but my experience is that the publication of name and address draws down on the writer a multitude of postal inquiries which cannot remain unanswered without a breach of good manners, and yet entails on him an expenditure of time which can be ill afforded, and it is rare the inquirer (in all probability a stranger) thinks of enclosing postage. Surely the publication of name only would be sufficient?

One more growl and I have done. In No. 2 you imply an act of discourtesy done by the Rev. H. R. Peel, Hon. Secretary of the British Beekeepers' Association. I have the honour to call Mr. Peel my friend, and, as such, defend him. He is on a tour in the East, and is now and has been for some time past in Egypt. Mr. Peel never spares trouble or expense to help our cause, and did he not think it advisable to accept your offer he would at least have declined with courtesy had it been in his power.

I congratulate the Beekeeper on receipt of communications from Messrs. Rait and J. G. Wood. The former writes in a pleasing manner, clearly and well; the latter has much foreign experience, and is able to give us many valuable wrinkles from our neighbours in the far North.

John Hunter.

REMARKS ON THE PRECEDING.

WE are very pleased to receive this communication from Mr. Hunter. It is evidently written in a spirit of fair criticism, and we hope our remarks on it will be received by him and other readers of the BEEKEEPER in as friendly a manner as we have taken his.

(a). In the paragraph (page 17) in which reference is made to the proposal of the British Beekeepers' Association to publish a periodical in the interests of their society the remark is made :—"This was an individual opinion, and we have had no means of ascertaining whether it is confirmed by others." Our opinion, so expressed, was grounded upon the fact that the circular in question was first shown to one of us (and afterwards given us at our request) by a gentleman, a member of the Association, who is a *professional beekeeper*, and who told us that in response to it—and, if we remember rightly, a letter which accompanied it—he sent a promise of £5 to the guarantee fund proposed. We thought, and still think, that if the proposed journal were owned by professional beekeepers the impression of those who were not guarantors would be that it would be difficult to carry on the paper in an independent or impartial manner. Since, however, the committee seem, from Mr. Hunter's remarks, to have decided that only non-professional apiarians were to be allowed to conduct it, this danger would have been removed.

(b.) The address to subscribers said there was no organisation with apiculturists. The British Beekeepers' Association consisted, in July last, of 197 members, according to the list published with the catalogue of the show at the Horticultural Gardens. We presume this Association is the largest of its kind, but what a small proportion does 197 bear to the vast number of beekeepers in England! Moreover, when the Association was mentioned in the address to subscribers it was, with the provincial societies, brought forward as an exception to the want of organisation. Again, no criticism was made on the Association, but these words were used :—"*Should* we criticise any of its (the Association's) proceedings, we trust our remarks will be taken in good spirit." Hitherto no criticism on the Society's proceedings has yet been made in the pages of the BEEKEEPER, simply because no occasion has arisen for it. The hint we mentioned was merely this—that if a little more system were infused into the arrangements for the lectures given in the bee-tent, repetition by succeeding lecturers might be avoided, and more instruction gained by the audiences.

(*c.*) As mentioned under (*b*) the British Beekeepers' Association numbered in July but 197 members. Is it possible, or even likely, that the Association should know every man who takes an interest in the study and practice of apiculture? We quite agree that a critic should show himself master of his subject, and it would have been presumption on our part to have even thought of starting the BEEKEEPER had we not made ourselves thoroughly acquainted with the objects of the Association and the idiosyncrasies of the prominent beekeepers, besides having ourselves devoted much study to the subject of apiculture. At the same time we greatly desire two things: First, that the ranks of the Association may swell to such numbers that it will be impossible to run a "dark horse" again. Second, that apiarians will make such use of our pages that we ourselves shall have little or nothing to write. The BEEKEEPER is intended as a field for friendly controversy, so that many subjects connected with bee culture, hitherto doubtful, may be made clear. This could never be done by ourselves alone—we need co-operation.

(*d*) The firm to which the honey was offered by a beekeeper and, as we should have added before, *honey collector*, and which made a bid of tenpence, with a promise that if the honey were found good a proposal for a contract for the whole of next year's supply and collection might be made, is Messrs. Petty, Wood, and Co. Our informant, a Mr. Baker, was the commission agent employed by the vendor, and he was to receive 2½ per cent. on the transaction from the seller.

(*e.*) The name of the beekeeper was also told us. Unless the proposal to keep a stall at the Columbia Market is referred to, we *are* in ignorance of any such organisation by the Association; yet we should be glad to hear more of it, and wish it every success.

(*f.*) We cordially accept this suggestion. The trouble to our friends mentioned as likely to arise from publication of addresses never struck us, and we at once alter our rule. We think, to show that we maintain our boast of being independent, that the publication of names should be imperative, but in future we will leave it to those favouring us with correspondence or articles to say whether they wish their addresses printed or missed out.

(*g.*) Our acquaintance with Mr. Peel is only that of sight and repute. The latter tells us what the former confirms, that he is a gentleman who never acted discourteously, and we are extremely sorry that anyone should imagine that we meant to imply that we considered him capable of such an act. We ought to have said that it was only a week before publication that we wrote him, thus giving him but very little time for consideration of, and answer to, our offer. We knew there must be some good reason for his silence, and were, therefore, not surprised to learn, after publication, that he was away from home.—EDITOR.

SOME RECENTLY OBSERVED FACTS REGARDING QUEENS.

BY MR. RAITT.

SOME four or five years ago my attention was first drawn to the fact that queens frequently became useless from the loss of a leg or a part of one, or owing to the paralysis of an otherwise perfect limb. Since then my first impulse on inspecting a hive is to observe whether her majesty has the regulation number of these locomotive appendages. The result is a positive conviction that in almost every case of the failure or loss of the queen there may be found this deformity. I cannot account for it, but there is the fact, and I commend it to the attention of every beekeeper as of great importance. By keeping a sharp look-out the disabled queens may be discovered and superseded before the stock has seriously suffered. Occasionally the deformity is but slight, only the claws of one foot being wanting, in which case the queen may be still able to balance herself as if in the act of laying eggs; but more frequently so much of the limb is gone that she cannot do this, though quite able to walk about, and in the worst cases she cannot even hold her place on the combs, but wanders about the floorboard, generally ending by crawling out as if resolved to rid the stock of her useless presence. The deformity is not confined to queens of any particular age, as I have in some cases had to destroy virgin queens for the same reason. Neither is it more common in bar-frame hives, as if it might have resulted from accidental pinching. It is common enough even among imported queens just arrived. In some cases the portion of the leg left turns black and rigid, while in others it moves in a natural way.

I can easily fancy queens caged amongst hostile bees having their legs or wings torn through the meshes of the cage, and, indeed, have observed this more than once, but the most of the cases I have observed were entirely apart from such a cause. I have also frequently discovered bees encasing their own queen and hunting her in a hostile manner about the combs; but in such cases I generally discover her dead body thrown out within a day or two, generally, however, maimed. Whether the result of hostility on the part of the bees or of a hitherto unknown disease, the facts are as I have indicated; and, as I have never observed any reference to them by any other writer, I would express a hope that beekeepers will give attention to the matter and lay the result of their observations before us.

It has hitherto been generally supposed that if, by stimulative feeding or otherwise, we can coax a queen into laying eggs, we can depend on getting brood reared. Much to my chagrin this fallacy is now exploded. During the late autumn, as a result of my experiments in pollen feeding, I came to the conclusion that as both larvæ and adult bees required nitrogenous

food, no brood could be reared without pollen, and I think my experiments have fully demonstrated that. But it rather took me by surprise to discover that in some of my hives that reared no brood for many weeks the queens were steadily laying all the time. I had been feeding some stocks on flour, candy, and syrup, and others on syrup alone. The former had several cards of brood even into November, while the latter, though plenty of eggs were always found in the combs, never reared any. Day after day for weeks the eggs were seen, frequently two or three in one cell, but never a grub. The stocks were fairly good and quite able to maintain a hatching temperature. I came to the conclusion that as the eggs hatched out and the larvæ died from want of pollen food, fresh eggs were laid in the same cells, and thus my poor queens had been kept laying every three days as many eggs as others were doing with so much better results in three weeks. Regarding it as certain that such treatment would inevitably "play out" the best queen long before her natural term, I secretly resolved to abandon mere syrup feeding for the future, unless at a time when natural pollen is being gathered. But here some will object that there might be plenty of stored pollen in the hive, in which case the syrup would be sufficient. It might for a very short time—that is, so long as the syrup came in very slowly indeed; but as soon as syrup or honey is stored in any quantity, the stored pollen is entirely covered up, the bees themselves not knowing in which cells to seek it. This is even more likely to be the case in autumn than at any other season, owing to the instinct of the bee leading it to store its supplies right in the brood nest, where the pollen is generally found. In such a case I have no hesitation in saying that no amount of mere sugar feeding will cause brood to be reared unless natural pollen is being gathered at the time. Thus in fact are our valuable queens being over taxed for nought. Yet how naturally the bees will, without any such stimulant, start brood-rearing even in midwinter! Why? Because by that time they have consumed so much of their honey that the buried pollen is once more discovered, to be applied in the most natural way to the rearing of their young.

As the result, then, of the past season's experience I would propose the following rule as to feeding—viz., when brood-rearing is no object feed as rapidly as possible, otherwise feed very slowly, and make sure either that there is considerable stored pollen in an unsealed state, or that it is being gathered at the time, or supplied in an artificial form.—*Journal of Horticulture.*

MR. CHESHIRE ON CHAFF COVERS.

Frost has now given us a decided grip, and but little supplementary work can be done in the way of defending bees from its rigour. If winter passages have not been made our stocks must take their chance without them. If our hives have not been contracted the poor bees must fight as best they can against the excessively chilling effect of an unnecessarily large number of combs and extent of hive wall, until some considerable rise in temperature makes it possible to remove the excess, putting in a dummy or false hive side and filling-in the spaces made with chaff, hay, fine shavings, sawdust, rags from the ragbag, cotton waste, cork dust, or some such non-conductor of heat. Of all these I prefer the first as most handy and economical, while for wintering even strong stocks would recommend not more than seven Woodbury frames or their equivalent. I have several lots far from weak to which only five frames are given. These, of course, need to be well stored with honey while the bees—filling fairly the whole space allowed them, and clustering safely even against the well-defended hive side—are snug and dry in every part. No combs are mildewed, and when spring with its strengthening sun again smiles upon us the removed combs can by degrees be added, to the immense advantage of the then strengthening colony.

But one method of increasing the protection of our stocks in frame hives the present cold will not prevent us from adopting. I allude to chaff covers. The greater number of beekeepers are now using quilts over the tops of the frames; but if instead of the divided crown board, or even the now almost obsolete single crown board be retained, the chaff cover will be found equally valuable. It consists simply of a frame of thin wood nailed together like four sides of a shallow box, about three inches deep and of the length and breadth of a hive or portion of the hive containing the bees. To the edges of this wood, so as to form the bottom of the box, is fixed with tacks a piece of cheese cloth sacking or felt (I usually use the scrum which has through service become untrustworthy for confining swarms), and then the cover is placed over the quilt or crown board as the case may be. It is now filled up with chaff, when, without impeding ventilation, it protects in a most effective manner from cold. The quilt in such weather as we are now experiencing will always feel very chilly to the hand; but if a chaff cover be used and it be lifted the quilt beneath will appear warm to the touch, a proof at once of the conserving power of the chaff. We shall appreciate the value of the chaff cover if we remember that it is above and at the upper part of the hive that protection is of most service—a fact forgotten apparently by some, since prize-winning hives in a few cases have here been the thinnest. Where it is adopted the bees will be found less impoverished in stores, stronger in numbers, and individually more vigorous in the spring than where excessive leaking away of temperature has been allowed.—*Journal of Horticulture.*

ON THE UTILITY TO FLOWERS OF THEIR BEAUTY.

The Hon. Justice Fry has contributed a paper on the above subject to the *Contemporary Review* for December, which should be read by all lovers of nature, and is of great interest to the beekeeper.

The writer commences by asking the questions, "Is the system of the universe intellectual, or is it purely materialistic? Is there an ordering mind, or is there merely blind and struggling matter? Are there final causes as well as material causes, or are there material causes only?" His own answer may be found in the following words:—"The existence of beauty in the world is a very remarkable fact. On the theory of a divine and beneficent Creator, this fact has seemed no difficulty; but the theory of a mere blind fermentation of matter gives no account of it, except as a mere accident, which, on the doctrine of chances, should be perhaps a very rare and unusual accident. Hence the existence of beauty has from of old been a favourite theme of the theistic believers." "Let them know how much better the Lord of them is," says the author of "The Wisdom of Solomon," speaking of the works of Nature, "for the first author of beauty hath created them . . . . for by the greatness and beauty of the creatures proportionably the Maker of them is seen."

Speaking of the existence in the world of ugliness as well as of beauty, and deducing from this very fact that the perception of beauty is not mere habit, but that we have an inward and independent judgment on the matter, and can approve the one thing on the score of beauty, and reject the other as ugly, he remarks:—

"Even allowing for the existence of ugliness it must be conceded that the world around us presents a vast mass of beauty—complex, diverse, commingled, and not easily admitting of analysis. It is common alike to organic and inorganic realms of Nature. The pageants of the sky at morning, noon, and night, the forms of the trees, the beauty of the flowers, the glory of the hills, the awful sublimity of the stars—these, and a thousand things in Nature, fill the soul with a sense of beauty, which the art neither of the poet, nor of the philosopher, nor of the painter, can come near to depict. We are moved and overcome, sometimes by this object of beauty, sometimes by that, but yet more by the complex mass of glory of the universe.

"For Nature beats in perfect tune,
And rounds with rhyme her every rune;
Whether she work on land or sea,
Or hide underground her alchemy.
Thou canst not wave thy staff in air,

Or dip thy paddle in the lake,
But it carves the bow of beauty there,
And ripples in rhyme the oar forsake."

Besides that utility of beauty which appeals to the notice and appreciation of makind there is a further utility—the beauty of flowers attracts insects.

"Flowers," says Mr. Darwin, in his "Origin of Species," "rank amongst the most beautiful productions of Nature, and they have become, through natural selection, beautiful, or, rather, conspicuous in contrast with the greenness of the leaves, that they might be easily observed and visited by insects, so that their fertilisation might be favoured. I have come to this conclusion, from finding it an invariable rule that when a flower is fertilised by the wind it never has a gaily-coloured corolla. Again, several plants habitually produce two kinds of flowers; one kind open and coloured, so as to attract insects; the other closed and not coloured, destitute of nectar, and never visited by insects. We may safely conclude that, if insects had never existed on the face of the earth, the vegetation would not have been decked with beautiful flowers, but would have produced only such poor flowers as are now borne by our firs, oaks, nut, and ash trees, by the grasses, by spinach, docks, and nettles."

Referring to the same thing, Mr. Fry observes, "No one can doubt who watches a meadow on a summer's day that insects are attracted by the scent and colour of the flowers. The whole field is busy with their jubilant hum. These little creatures have the same sense of beauty that we have. . . . What a deadly blow to that egotism of man which thinks of all beauty as made for him alone!"

There are thus three kinds of attraction which operate on insects—the conspicuousness of the colour and form, the beauty of smell, and the pleasant taste of honey, and this threefold beauty is clearly of direct use to the flower which exhibits it. There are many flowers, however, of great beauty which do not owe their fertilisation to insect agency. "But is it better," asks Mr. Fry, "for a flower to be fertilised by insects than by the wind, or by some other agency, if such exists?"

Before answering this question the writer says that the conclusion that beauty is useful for the fertilisation of the flower does not rest merely on the phenomena of a summer meadow, but is confirmed by other observations. The beauty of many flowers is enhanced by their grouping, or by the "massing of small flowers into dense cushions of bright colour." Alpine flowers are instanced The great size of Alpine flowers as compared with that of the whole plant, and the great brilliance of Alpine plants as compared with their congeners of the lowlands, as well as the brilliant colours of Arctic flowers, have all been explained by reference to the comparative rarity of insects in the Alpine heights and Arctic regions, and the consequent necessity, if the plants are to survive, that they should offer strong attractions to their needful friends.

Besides instancing other plants which show by their structure that they cannot be fertilised but by some foreign agency, generally that of insects, Mr. Fry mentions others, including a great proportion of those with unsymmetrical blossoms, of which the flowers have been shown to be specially adapted by various mechanical contrivances for insect agency. Thus their beauty, or rather conspicuousness, is in many cases useful to the plant. But beauty is by no means the only agent necessary in this process; the agencies actually in operation are very numerous.

Many plants are fertilised by the wind, others by the withering of the corolla; some by the closing of the corolla over the anthers and stigma in the sleep of the flower, while several have a more complex arrangement.

After describing the mode of self-fertilisation of several flowers, Mr. Fry draws this conclusion:—"These instances are sufficient to make us pause before we conclude that all conspicuous flowers are fertilised by insect agency; that it would be a great error to suppose that all flowers are fertilised by insects or by the wind; and that it is probable the more the subject is considered the more complex will the arrangements for fertilisation be found to be."

Returning to the question whether insect fertilisation is more beneficial to the plant than fertilisation by the wind or any other agency, the violet is brought forward, *inter alia*, as an answer. The violet is one of a numerous class of plants, bringing forth two kinds of blossoms, the one conspicuous, the other inconspicuous; the one visited by insects, the other self-fertilising. The latter, or cleistogamous flowers as they are called, are seen in the violet in summer and autumn, "when all the more brilliant flowers have gone. The one flower has everything in its favour—honey and a beauty of colour and of smell that has passed into a proverb—and it opens its blue wings to the visits of the insect tribe in the season of their utmost jollity and life. The other has everything against it; it is inconspicuous, scentless, ugly, and closed. And yet, which succeeds the better? Which produces the more seed? The cleistogamous, and not the brilliant flowers. The victory is with ugliness, and not with beauty."

After considering at some length the question—"The flora, like the fauna, of the world has changed, how has it changed as regards the beauty?" the article is finished with the following words:—

"I see in Nature both utility and beauty; but I am not convinced that the one is solely dependent upon the other. I find a grace and a glory (even in the flowers of plants) which, on the utilitarian theory, is not accounted for, is a residual phenomenon, and that in such enormous proportions that the phenomenon explained bears no perceptible proportion to the phenomenon left unexplained. Whether this be so or not, it appears to me, for the reasons I have already given, that we may still entertain the same notions about the beauty of the world as before. Our soils may still rejoice in beauty as of old. To some of us this glorious frame has not appeared a dead mechanic mass, but a living whole, instinct with spiritual life; and in the beauty which we see around us in Nature's face, we have felt the smile of a Spiritual Being, as we feel the smile of our friend adding light and lustre to his countenance. I still indulge this fancy, or, if you will, this superstition. Still, as of old, I feel (to use the familiar language of our great poet of Nature)—

"A presence that disturbs me with the joy
Of elevated thoughts; a sense sublime
Of something far more deeply interfused,
Whose dwelling is the light of setting suns,
And the round ocean, and the living air,
And the blue sky, and in the mind of man:
A motion and a spirit that impels
All thinking things, all objects of all thought,
And rolls through all things. Therefore am I still
A lover of the meadows, and the woods,
And mountains; and of all that we behold
From this green earth: of all the mighty world,
Of eye, and ear."

THE SCARCITY OF INSECTS.

Although during the spring of the past year large numbers of queen wasps and humble-bees were seen on the wing, they had been well protected during the severe winter by the covering of snow that lay so long, but the great amount of wet during the spring and summer caused many to perish. Scarcely a specimen of either is now to be found. "Bykes" that were commenced were soon found tenantless. Not a grasshopper has been heard chirping in our meadows. The gooseberry catterpillar made its appearance early, but soon vanished, doing almost no injury to leaf or fruit. Butterflies have been few; the honey-bee has suffered under the chilling summer, and no honey harvest is recorded. Notwithstanding this, several fine specimens of the dragon fly (*libellula*) have lately been seen on the wing in mosses and marshes.—Ento (Fifeshire).—*Land and Water.*

[Note.—In the South of England the gooseberry catterpillar has been hard at work, and we saw, towards the end of August, rows of trees perfectly denuded of leaves. The late damp weather would be just the thing for the dragon fly. A friend of ours has two nests of the bombus or humble bee in his garden, and he has the intention of sending the queens out to New Zealand for the sake of the fertilisation there of the red clover.—Editor.]

A NEW WORK.

M. Le Riche, Editorial Secretary of the Apicultural Society of the Somme, and an authority on bee matters, informs us that he is about to publish, under the auspices of the same Society, a work called "Studies and Notes on the Apiculture Exhibited at the Paris Exposition of 1878" ("Des Etudes et des Notes sur l'Apiculture à l'Exposition Universelle Internationale de Paris en 1878"). There will be 150 engravings interspersed with the text. The work will be in two parts, at the very low price of 1 fr. 25c. each. Our readers desiring to purchase the book should address P.O. order to M. Le Riche, Thézy-Glimont, par Moreuil (Somme), France.

THE MAHWAH TREE.

A Proposed New Food for Bees.

Mr. Thomas Christy, F.L.S., has sent us a sample of the dried flower of this tree. He thinks it might be made use of as an artificial food for bees. Unfortunately we did not receive it in time to make any experiments with it, or at least to give the results of any experiments; but we should be glad if any of our readers will try what they can do with it and let us know, for publication, what they think of it.

The Mahwah tree is a native of Bengal, but is abundant in all parts of Central India, from Guzerat to Behi, and is cultivated in other parts of India. It grows to a height of 60 feet, the trunk being often six or seven feet in circumference. A gum exudes from the bark.

The flowers are produced in enormous quantities in March and April after the old leaves have fallen off, and before the new leaves have appeared; the crop rarely fails. The fleshy flowers fall off and cover the ground beneath the trees, and are gathered eagerly by the natives every morning during the flowering season; a single tree yields from 200 to 400 lbs. weight of flowers. These flowers are stored as a staple article of food by the Bheels and other tribes, and so valuable do they consider these trees that in time of war the threat of cutting them down generally reduces them to submission when unruly.

The dried samples sent us have the odour and appearance of Sultana raisins. M. Petit, a French chemist, found that the flowers so dried contain half their weight in sugar. We have slowly boiled some in water, and find that the syrup becomes somewhat thick and very sweet. Should this syrup prove to be acceptable and invigorating to bees, the Mahwah flower will be found useful in the apiary, more especially in those whose owners keep pigs or poultry.

For in a paper recently read before the Linnæan Society by Mr. Lockwood, that gentleman stated that the wild animals of many kinds troop eagerly to the Mahwah trees during the season to feed on the flowers. He was, therefore, led to experiment on domestic animals, and he perceived that the flesh of pigs fed upon Mahwah flowers in this country was much improved, and acquired a delicate flavour. The animals so fed rapidly came into condition. After the syrup was made from the flowers for the bees we should imagine that the flowers themselves might still be found nourishing for pigs or poultry.

The flowers, when dried, will keep for almost any length of time, and do not appear to be attacked by insects.

A spirit is distilled from the flower, very similar to that of Irish whisky. It has been found that when placed in an oakwood cask it takes a yellow colour, and is then preferred to Irish whisky of high quality. The analysis shows it to be a most wholesome spirit. This spirit is manufactured to a very great extent in India.

From the seeds an oil is extracted by the natives; it is used for lighting purposes and soap making.

THE MONTH.

The prognostications of weather mentioned in our October number have so far proved incorrect, and instead of a mild winter we have experienced exceptionally severe cold. It has already been a trying time for the bees as well as for their owners. The *Echo* of the 12th instant, however, gives us hope for a little improvement, and we trust the hope may not prove fallacious:—

"There is some reason to think that the present abnormally cold weather from which we are suffering will give place to a milder season in January, if not before. It is certain that the Arctic winds must be piling up immense masses of water in tropical regions, and when the reaction comes we shall probably have a steady flow of the warm waters of the Gulf Stream in what would otherwise be mid-winter and the coldest season. The wish may be father to the thought, but in this case, though we know so little, scientifically speaking, of the vagaries of the weather, there is very good ground for believing that a comparatively mild season will follow the present inclement period."

There is very little work to be done now among the hives, merely an occasional walk round to see that all is snug and comfortable, that mice do not abound, and that floor-boards and entrances are clear. All implements and appliances requisite for next season should be put in order and carefully packed away ready for the time when they shall next be wanted. Combs not in use now, but which will be handy for next season, must be kept clean and dry, or when they are wanted they will be found useless.

In January those colonies which have been kept under cover will, on sunshiny days perhaps, appear a little restive. On those days which are exceptionally mild the hives may be taken to their summer stands, for a little freedom of flight will be found beneficial to the bees. But the hives must be returned to their winter quarters before nightfall.

Intending apiarians, or those who have hitherto not paid much attention to their bees, should now decide what line of profit they intend to essay next season—whether increase of numbers of colonies, the sale of swarms, or the collection of honey—and make their preparations accordingly.

Those who intend to buy new hives for the spring will do well to purchase, or, at least, give their orders, now. Hive makers, as a rule, do not keep a large stock of hives for sale, and it only stands to reason that if they are allowed plenty of time for manufacturing hives they will be less likely to hurry over their task and to sell a carelessly-made article. If all orders come in only a week or two before the hives are wanted it very often happens that they cannot be executed until a few valuable days of honey or pollen gathering have been lost, and the hive itself is not so perfectly made as it, perhaps, otherwise would be. In such a case the purchaser is as much, if not more, to blame than the hive-maker. We are sometimes asked where to purchase hives; but it is impossible for us to recommend any one maker. Our advertisement pages, however, give those who intend to invest a choice of vendors, and to these pages we refer those of our readers who intend to buy. Most, if not all, of our advertisers send out price lists on application by post.

Many of our readers, we hope, will, during the next season, watch their bees closely with a view to scientific investigation. This can be done, by those who have time

to spare, with but little interruption to the profit pertaining to beekeeping. Others, on the other hand, will look only to the profit. To one and all we recommend that some register of their hives should be kept. Its use to the student of apiculture must be apparent. Its use to the beekeeper who wishes to make money is this—that all mistakes, as well as all successes, would be recorded, and in future seasons the actions or methods that led to the former might the more easily be avoided, while those that led to the latter might be repeated, and perhaps improved upon. Mr. J. G. Wood, Vice-President of the Danish Beekeepers' Association, himself an experienced and energetic apiarian, suggested the plan of such a register in the pages of the *American Bee Journal* for April last, and we copy it from that paper for the benefit of those of our readers who would desire to keep a record of their bees and hives.

No...... *Fol......* *Month.......... 18......*

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Observations and Remarks.

No...... *Month..............18....* *Race........*
Class of Hive................... *Queen's Age......................*
No. Frames............ *Size.......*

Date.		Queenless.	Queen's Cells.	Queen Hatched.	Q'n Fertilised.	Eggs Laid	Bees.	Swarms	Honey Harvested	Honey Fed, lbs. Sugar Fed, lbs.	Wax, lbs.
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2											
3											
4											
5											
6											
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Some apiarians keep a slate on every hive (every hive should be numbered), on which they make their record daily.

Christmas will come and pass, and the new year (1880) will have commenced before we again address our readers. To one and all we sincerely wish the compliments of the season, " A Merry Christmas and a Happy (and plenty-of-honey-gathering) New Year ! "

WAX.

"Wax was long supposed to be derived by bees from the pollen of plants, swallowed by them, and then voided under this new form; but it has been proved by the experiments, first of Mr. Hunter, and more especially by Huber, to be the peculiar secretion of a certain organ which forms part of the small sacs situated on the median line of the abdomen of the bee. On raising the lower segments of the abdomen these sacs may be observed, as also scales or spangles of wax, arranged in pairs upon each segment. There are none, however, under the wings of the males and the queen. Each individual has only eight wax sacs, or pouches; for the first and the last wing are not provided with them. Huber satisfied himself by precise experiments that bees, though fed with honey or sugar alone, produced nevertheless a very considerable quantity of wax; thus proving that they were not merely collectors of this substance from the vegetable kingdom."—*Ure.*

An analysis of pollen, made by W. von Scheider, will show the very small amount of wax contained therein, and the tremendous labour which it would be necessary for the bees to undergo had they to look to this means alone for providing the amount of wax requisite for comb-building.

Pollen consists of:—

Water	29.89
Ash (chiefly alkaline phosphate)	3.08
Albumen and peptones	17.81
Sugar	25.12
Fat, fat acids, cerotic acid,* myricine, oleic acid Colouring matter	8.98
Cell membrane	7.56
Pectin	7.42
	99.86

Dr. Hassall gives the following tables of compositions, which may interest those who desire to use pea-flour, &c., as artificial pollen:—

	Air-dried and shelled green peas.	Air-dried common white field beans.
Water	12·7	19.3
Starch, dextrin, and sugar	57·7	45·4
Legumin	21·7	22·8
Fatty matter	1·9	2·7
Cellulose	3·2	6·2
Mineral matter	2·8	3·6
	100	100

Lentil.

Water	14·0
Starch	35·5
Gum	7·0
Sugar	1·5
Legumin	25·0
Fat	2·5
Cellulose, pectin, &c.	12·0
Mineral matter	2·5
	100

It is insisted by some writers that nitrogenous food is absolutely necessary to bees before they can form wax. Huber, however, fed bees in captivity on pure sugar (which contains no nitrogen, but only hydrogen, oxygen, and carbon), and found that they could and did secrete wax and build comb. But bees could not long continue in health without a certain quantity of nitrogen, and as they can only secrete wax when they are healthy, it follows as a matter of course that nitrogen is necessary to the secretion of wax. Yet the nitrogen consumed forms no part of the wax.

More wax is secreted by bees in repose than by those in activity, but the formation often goes on while the bee is busy honey-gathering, more especially at those times when there is much honey to be collected and when comb-building is in arrear. It is not known whether bees secrete wax voluntarily, or whether the formation takes place only as it is required.

Propolis is not wax, but is of a resinous nature, and is collected by the bees from buds and leaves, from the oozing gum of several trees, as well as from varnish. It contains, however, a very small percentage of wax.

In 1794 a paper was read by Dr. Pearson at a meeting of the Royal Society on "a wax-like substance resembling the Pé-La of the Chinese, collected at Madras by Dr. Anderson, and called by him white lac."

Dr. Anderson had noticed nests of insects resembling small cowry shells, which the natives eat with great avidity. These supposed nests he shortly afterwards discovered to be the coverings of the females of an undescribed species of coccus; and having noticed, in the Abbé Grosier's account of China, that the Chinese collect a kind of wax, much esteemed by them, under the name of Pé-La, from a coccus deposited for the purpose of breeding on certain shrubs, and managed exactly in the same manner as the Mexicans manage the cochineal insect, he followed the same process with his new insects, and shortly found means to propagate them with great facility on several of the trees and shrubs growing in the neighbourhood.

On examining the substance he observed in it a very considerable resemblance to beeswax; and noticed, moreover, that the insect which secretes it provides itself, by some means or other, with a small quantity of honey resembling that produced by our bees; and he complained, in one of his letters, that the children whom he employed to gather it were tempted by its sweetness to eat so much of what they collected as to diminish materially the produce of his crop. After some time, however, he managed to send to England several pounds of it, both in its natural state and melted into cakes, as also some of the insects adhering to the branches on which they had been cultivated. With these Dr. Anderson made a series of investigations, the results of which formed the substance of the paper which he read before the Royal Society.

Further inquiry has been made into the matter from time to time, and at present our knowledge informs us that lac is a resinous substance produced by the puncture of a peculiar female insect, called *Coccus lacca* or *ficus*, upon the branches of several plants.

The substance is not wax, however, but contains only about 5 per cent. of it.

A few words about the *Coccus lacca* may be of interest. "The female insect is about the size of a louse, red, round, flat, with twelve abdominal circles, six claws, half the length of the body, and a tail shooting out, by a division, into two parts. The male is twice the size, has four wings, and there is one male only to every 5,000 females. In November or December the young brood makes its escape from the eggs, lying beneath the dead body of the mother; they crawl about a little way, and fasten themselves to the back of the shrubs. About this period the branches often swarm to such a degree with this vermin that they seem covered with a red dust; in this case they are apt to dry up by being exhausted of their juices. Many of these insects,

* As mentioned at the end of this article, cerine or cerotic acid and myricine are two *simple* species of wax found in the *compound* bleached wax.

however, become the prey of others, or are carried off by the feet of birds, to which they attach themselves, and are transplanted to other trees. They soon produce some nipple-like incrustations upon the twigs, their bodies being apparently glued by means of a transparent liquor, which goes on increasing to the end of March, so as to form a cellular texture. At this time the animal resembles a small oval bag, without life, of the size of cochineal. At the commencement a beautiful red liquor only is perceived, afterwards eggs make their appearance; and in October or November, when the red liquor gets exhausted, twenty or thirty young ones bore a hole through the back of their mother, and come forth. The empty cells remain upon the branches. These are composed of the milky juice of the plant, which serves as nourishment to the insects, and which is afterwards transformed or elaborated into the red colouring matter that is found mixed with the resin, but in greater quantity in the bodies of the insects, in their eggs, and still more copiously in the red liquor secreted for feeding the young. After the brood escapes the cells contain much less colouring matter."—*Ure.*

Seed-lac and shell-lac are made from this substance, the latter of which is used largely in the manufacture of sealing-wax and varnishes.

A very large trade is done in lac-dye, formed from the same substance.

Besides the wax secreted by bees, it is also found largely as a vegetable product, large quantities of which are now received from various countries. The principal are those known as the Carnauba wax imported from Brazil, which is the produce of the *Copernicia cerifera;* myrtle-berry wax, the produce of some species of the *Myrica* in South Africa and North America, and the Japan vegetable wax obtained from the fruit of *Rhus succedaneum.*

The Japan wax is the most important, commercially speaking. The first cargo imported from Japan direct to England was in April, 1859, when the American ship *Florence*, from Nagasaki, discharged her cargo in London. In 1867 we imported 8,964 cwt., valued at £37,817. In 1876 we received 12,325 cwt., valued at £24,650, the price having considerably declined.

The native method of producing the wax is of a very primitive description. The berries, having been gathered, are washed and bruised after a rude fashion; and being then slowly boiled the wax is extracted and thrown to the surface. Having been skimmed off it is moulded into cakes of about 30 lbs. each, which, being dried in the sun, are fit for use.

This beautiful wax, one part of which varies but little from another, has a bright cream colour; is nearly of the consistence of beeswax; bears, without softening, a high degree of atmospheric heat; and as it contains a large percentage of stearine, it is highly suitable for the manufacture of candles, particularly of those known as "composites," as well as for other purposes.

Wax forms a part of the green fecula of many plants, particularly of the cabbage; it may be extracted from the pollen of most flowers, as also from the skins of plums and many stone fruits. It constitutes a varnish upon the upper surface of the leaves of many trees, and it has been observed in the juice of the cow tree. The berries of the different species of myrtle afford abundance of wax.

The straw of cereals yields a white wax, greasy to the touch, insoluble in water and in caustic alkalis, soluble in alcohol, especially when warm, also in ether and in carbon bisulphide. Wax is also contained in meadow and clover hay, and in pea straw. In meadow and clover hay 1·0 to 1·3 of true fat is found, together with 0·4 to 0·6 per cent. of wax; rye and barley straw yield about 0·5 per cent. of true fat, and about the same quantity of wax. König gives the following table:—

	Fat.	Wax.
Meadow hay (mean of 5 samples)	1·07	·45
Clover hay	1·23	·38
Rye straw	·52	·31
Oat straw	·55	·33
Rye grain	1·35	·09

Bees wax, as obtained by washing and melting the comb, is yellow. It has a peculiar smell, resembling honey, and derived from it, for the cells in which no honey has been deposited yield a scentless white wax. Wax is freed from its impurities, and bleached, by melting it with hot water or steam in a tinned-copper or wooden vessel, letting it settle, running off the clear supernatant, oily-looking liquid into an oblong trough, with a line of holes in its bottom, so as to distribute it upon horizontal wooden cylinders made to revolve half immersed in cold water, and then exposing the thin films or ribbons thus exposed to the blanching action of air, light, and moisture. For this purpose the ribbons are laid on long webs of canvas, stretched horizontally between standards, two feet above the surface of a sheltered field, having a free exposure to the sunbeams. Here they are frequently turned over, then covered by nets to prevent their being blown away by the wind, and watered from time to time. Whenever the colour of the wax seems stationary, it is collected, remelted, and thrown again into ribbons upon the wet cylinder, in order to expose new surfaces to the bleaching operation. By several repetitions of these processes, if the weather proves favourable, the wax eventually loses its yellow tint entirely, and becomes fit for forming white candles. If it be finished under rain it will become grey on keeping, and also lose in weight.

In France, where the purification of wax is a considerable object of manufacture, about four ounces of cream of tartar or alum are added to the water in the first melting-copper, and the solution is incorporated with the wax by diligent manipulations. The whole is left at rest for some time, and then the supernatant wax is run off into a settling cistern, whence it is discharged by a stopcock or tap over the wooden cylinder revolving at the surface of a large water cistern, kept cool by passing a stream continually through it.

The bleached wax is finally melted, strained through silk sieves, and then run into circular cavities in a moistened table, to be cast or moulded into thin disc pieces, weighing from two to three ounces each, and three to four inches in diameter.

Wax purified as above is white and translucent in thin segments; it has neither taste nor smell; it has a specific gravity of from 0·960 to 0·996; it does not liquify till heated to 154½ deg. Fahr.; but it softens at 86 deg., becoming so plastic that it may be moulded by the hand into any form. At 32 deg. it is hard and brittle.

Wax is composed of carbon, hydrogen, and oxygen.* Of the first there are 81·75 parts in 109, which in burning generate 300 parts of carbonic acid gas. Now, since 125 grains of wax constitute the average consumption of a candle per hour, these will generate 375 grains of carbonic

* Hess gives the proportions as follows:—

Oxygen	7·50
Carbon	79·30
Hydrogen	13·20

acid gas, equal in volume to 800 cubic inches of gas. A man of ordinary size discharges from his lungs 1,632 cubic inches of carbonic acid gas per hour, which is very nearly double the quantity produced from one wax candle. Hence the combustion of two such candles vitiates the air much the same as the breathing of one man.

Bleached wax is found to consist of two species of wax, one called *cerine* or *cerotic acid*, the other *myricene*, so called because it exists in much larger proportions in the wax obtained from the *myrica* or myrtle.

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.

LECTURES—DIAGRAMS—MODELS.

TO THE EDITOR OF THE BEEKEEPER.

Sir,—I am much pleased with the November number of the Beekeeper you sent me. In reading "A Lecture on Bees" given at Page 43, the thought struck me that if proper diagrams were made of the different kinds of bees, their various organs, eggs, and brood in various stages, combs, &c.—take, say, the illustrations in "Dr. Cook's Manual"—and let them be prepared and lent to anyone by paying a small charge for hire, a few model hives, appliances, &c., could be added, a very instructive and interesting lecture might be given by anyone who takes a delight in bee culture.

It would be a boon to many a country place where they have some difficulty at times to fill up their programmes for the winter season's lectures and entertainments.

If you would put this before your readers, many, I am sure, would be willing to send a model of their hives, &c., and lend for such occasions, as it would be a good advertisement for them.

You might offer a prize for the best lecture suitable for reading before a country audience, and publish it in your valuable paper. The humane system of treating bees would thus be brought to the notice of many cottagers who never see the Beekeeper or any papers or leaflets on bee and their management.—I am, yours faithfully, H. Warren.

Woolmer Forest Apiary, The Lawn, Liphook, Hants,
26th November, 1879.

[We have received several letters on this subject, and take this opportunity of answering them all. At the monthly meeting of the Committee of the British Beekeeper's Association on the 12th ult., the report of a sub-committee appointed to inquire the cost of publishing the diagrams exhibited by Mr. Cheshire at the Society's show at the Horticultural Gardens was received, and Mr. J. M. Hooker reported that the Sub-Committee had made the necessary inquiries, and now submitted the following recommendations for the consideration of the Committee, viz.:—

1. "That the Committee should purchase the diagrams and copyright from Mr. Cheshire at a cost not exceeding the price named in the catalogue of the South Kensington Show, and have the same reduced and published on two sheets of double elephant sized paper, 40 by 27 inches, in four colours."

2. "That a circular should be issued to members and others stating that diagrams illustrative of bee-life and management will shortly be published for the use of schools and lectures and that the Association will lend on hire the original diagrams for the use of lecturers at a fixed fee, the diagrams to be packed in a proper packing-case, and the hirer to pay all carriage and damage that may occur during transit, and during the time they are in the hirer's possession."

The report of the Sub-Committee having been discussed at some length, it was moved by the Rev E. Bartrum, and seconded by the Rev. G. Raynor, and carried unanimously, "That the recommendations of the Sub-Committee, be adopted, and that one thousand copies of the diagrams, in four colours, as recommended by the Sub-Committee, be executed, and the same be sold to members at 5s. per set, and to non-members of the Association at 7s. 6d. per set."

It was also resolved, "That the Secretary be requested to draw up a circular, and issue to members and others stating that such diagrams will shortly be published at the above prices."

[With regard to models of hives, we shall be glad to receive any that our readers may send for the use of lectures, and we would gladly send them, free of charge except carriage, out to those who wish to use them.—Editor.]

HONEY WANTED.

TO THE EDITOR OF THE BEEKEEPER.

Sir,—Being in want of honey, I wrote to a gentleman, a beekeeper in Lincolnshire, to know if he had any to part with. His reply was that he had not got sufficient left for his own use, but referred me to your paper, stating that I might through you possibly render a service to a Lincolnshire cottager mentioned therein, who was unable to dispose of his honey. I have just obtained the first number of your paper, and am sorry to find that the Lincolnshire cottager has disposed of his honey, but at a ridiculously low price. Had he been fortunate enough to have seen the *Journal of Horticulture* of 20th March last, page 223, and put himself in communication with me, he might have found a much better market than he appears to have unfortunately secured. Should you happen to know any one unable to dispose of his *fine* honey, I shall be glad to assist in finding a customer for it.—Yours obediently, S. J. Baldwin.

Gipsy Cottage, South Vale, Upper Norwood, S.E.,
15th December, 1879.

[Another example of the want of a journal, or at all events of some means of bringing producer and consumer together. We are endeavouring to get together a list of "cottage" beekeepers for publication, as also a list of collectors, that we may distribute them gratis, and thus help both parties. Will our readers, or at least those who *really* desire to see an advance in the honey industry, help us? A few days ago we received a most carefully compiled list of some 164 names with addresses, and the number of hives kept. It must have taken some hours to prepare. We heartily thank the gentleman who sent it—we are, we suppose, not at liberty to publish his name, but he lives not a hundred miles from Oxford—as well as several others of our readers who have helped us in a similar manner.—Ed.]

A RECRUIT.

TO THE EDITOR OF THE BEEKEEPER.

Sir,—I have just received your first number of the Beekeeper, and though I have not heretofore attempted apiculture, the perusal of its very excellent pages has so much interested me that I have determined to become a subscriber and beekeeper at once.

I have always been much interested in the natural history and habits of these very wonderful little creatures, but dreaded the trouble I supposed to attend in keeping them in a district almost without a cultivated fruit tree within three miles; but I shall now go to work with confidence in your journal, and your kind contributors' advice.

One of my principal subjects of wonder in connection with the honey bee has been that, although with the exception of two hives a friend possesses at a distance of five miles, I am quite sure there is not another within a radius of eight from my garden, still I continually see them amongst my flowers, especially in spring.

I do not think they come from quarters taken up in the rocks, for they would very soon be discovered by the natives, which would be their certain destruction.

It may be worthy of notice that for their very welcome visits I thank an old friend in the shrubbery (the flowering currant bush), which sends forth its powerfully flagrant pink corymbs of bloom before its leaves, even as if in a hurry to supply these industrious little workers with new food when it is most required.

I don't know whether they come for nectar or pollen, but one thing I suspect is that they are to be blamed for the fact that I have not yet seen one fertilised bloom upon my few bushes of this pretty shrub.

Bees get credit for being indispensable agents in the fertilising of flowers, which is well known, but I should like to know whether they are occasionally guilty of the opposite course by carrying away all the pollen. I should strongly recommend the extensive planting of this shrub; it is an extremely beautiful object when in bloom, and as easily grown and propagated as the ordinary currant of which it is a species, and blooms just when bees venture out in spring.—Yours very truly, J. M'Gann.

Burren, Co. Clare, Dec. 19, 1876.

SHOWS.

TO THE EDITOR OF THE BEEKEEPER.

Sir,—In your first number, which has been kindly lent to me by one of our leading beekeepers, I observe a few remarks respecting the relations existing between Apiarian and Horticultural Societies. Being greatly interested in the success of both of these bodies, I venture to write you a few lines.

To my apiarian friends desirous of working their "hobby" in connection with horticultural shows, and I know no better method of drawing public attention to our pets, I would suggest their being early in the field. They can then arrange for date convenient to both parties. Flower show schedules are generally prepared early in the year. If beekeepers delay making any movement till summer has arrived, can they blame the committee who decline making alterations to suit the convenience of the "drones?" In many of our country shows you will find that prizes are given for honey in some form or other. Cannot these societies be made available for the formation of bee clubs, &c., in our villages with a central depôt for the district for the supply of improved hives and appliances on the plan named in the Proceedings of the British Bee Keepers' Association, and the collection and distribution of honey as sketched in your notice to readers? I am sanguine enough to think that among the members of most of our horticultural societies may be found one or two willing and qualified to undertake the duties required to be performed, among the willing "workers" being

A Beekeeper since 17 Years of Age, and a Five Years' Honorary Secretary of an Horticultural Society.

FOREIGN NOTES.

AN EXPERIENCE: MILK FOOD.

Which pays best—to determine to obtain swarms or honey? This is a question which has often occurred to me.

Theory had persuaded me that it was most advantageous to set to work to ensure a harvest of honey. These are the reasons that seemed to me to guide my preference: A good hive can give, in a good season, either honey or swarms, 40 to 50 livres of honey, or one or two swarms, even three or four, by taking early care and feeding with milk. Now, 40 livres of honey are worth 50 francs with us, while a swarm sells for but 10 to 15 francs at most. Moreover, there are contingencies to be considered; the swarm is sometimes stolen, or the queen is lost during her nuptial flight, or the provisions for the winter are wanting, and it is necessary to expend 10 to 15 francs. Moreover, the arrival of honey is more certain than that of swarms.

Starting on this theory, then, in 1878, I sought only to obtain honey. By an abundant feeding with milk my Burki's hives were filled with comb and bees. The storage-room was large, some hives having had twenty combs constructed in them; the workers were abundant, but meanwhile, as everyone knows, the gathering of honey was a total failure. As I had not wished to obtain any swarms, I drew from my hive but one harvest—delusions! I regretted, after the event, not to have prepared for at least a few swarms, but it was too late.

The wet and cold spring time of the present year, the month of April with its cutting north-east wind, May with her snow and frosts, the hailstorms of June, made me believe that once again I should have no honey. At least, said I, I will take care to have swarms this time, and, after the losses of 1878, it will be easy for me to sell them. At the very time, then, of the great honey glut, I sacrificed all my best hives, with the exception of one, and I made a dozen swarms which succeeded well. I had not long to wait before I found out that I had committed a gross blunder. From the hive which I had left intact I drew, some weeks later, 50 livres of honey by the extractor, which did not prevent me from getting two swarms also. Without this premature swarming, ten hives in the place of one would have given me a like result. Not to exaggerate, I should tell you, however, that I was bound to make certain provisions for wintering these two swarms.

Sum total—I drew from my apiary about 150 livres of honey, which I sold at 1.20 francs to 1.30 francs the livre, more than 15 swarms, of which I have sold part. I have now 30 colonies.

Certainly, this result is not brilliant. Experience comes dear, but I like to believe it will profit me in future years.

Let me add that we no longer remove the swarms, but place them side by side with the parent hive without fear.

Should it interest you, I will give you some day the method which we prefer to follow. So far I have drawn three swarms from the same hive. At the time of placing them in winter quarters they were as vigorous as the colonies which had not swarmed; several meanwhile, I should tell you, had not a sufficient provision of honey. I had to feed them, therefore, with syrup.

One of my apiarian friends, who formerly had no confidence in milk as food, was determined, this year, to give it to satiety to a natural swarm. At the end of twelve days (if I mistake not) this swarm had taken ten litres of it; but it had constructed thirteen combs, and the greater part were full of brood. All those who have tried milk as food are enchanted with it.

I have been long, too long. I have but one excuse, that of which I am speaking is a subject loved as much by you as by myself.—R. H. Hauterive, of Fribourg.

[Note by Editor of *Bulletin*.—We shall always be charmed to receive communications from our colleague, and far from finding that he is too long, we regret that he has not given us the recipe for sugared milk food which succeeds so well with the Fribourgeoise. May we, in reply to the question with which he commences his letter, point out to him the counsel given by Mons. G. de Layens in his "Elevage des Abeilles"—Divide your colonies into two classes: hives having queens of one year, and hives having queens of two. The former should be consecrated to the production of honey, the latter to the rearing of queens and the multiplying of colonies.]—*Bulletin d'Apiculteur pour la Suisse Romande.*

APICULTURE IN THE CANTON OF FRIBOURG.

The Government of Fribourg grants annually a subsidy to each of the apiarian societies—the one German, the other French—established in our canton. They have each received 200 francs this year.

The latter society has not had less than four large general gatherings in 1879 in divers parts of the canton. That which took place at Hauterive, near Fribourg, was the last, and sixty members took part in it, who came from nearly all parts of the canton. Whether questions of administration, or purely theory, take up the greater part of our *séances*, our discussions always begin with practical experiencesin the apiary. At Hauteville these experiences mostly referred to wintering bees and the introduction of Italian queens. Each operation is fully explained and discussed in all its details. All there, even the most experienced apiarians, take the greatest interest in these practical questions, simple and elementary as they may be. The second part of our *séance* was taken up with debates commanding equal attention, but too often cut short for want of time, on the divers implements to procure, on the organisation of a library, and a small permanent exhibition of appliances for the apiary. An account was also given us of the last assembly at Lausanne.

We have resolved to direct henceforth our attention and care towards the regions of our canton which have the least profited, so far, by the perfection of modern methods. Our first *séance* next year, in the spring, will take place at La Broye, where we hope to alter the hives by setting forth the advantages of the movable system.

Apiculture here is becoming well developed, and in a few years the hut hives (*ruches taupinières*), such as those still considered as perfection in a large neighbouring country (thanks to the influence of a *journal fixiste*), will be no longer seen in our canton.

The harvest has not generally gone beyond a fair average. I have seen in the villages of Arconciel, Rossens, &c., more than sixty livres drawn from certain hives (our Burki-hives can contain thirty frames).

What is most difficult with us to decide is the employment of the extractor. Many consumers prefer honey in the comb because they are doubtful of the purity of the extracted honey.

May I call your attention to the apicultural establishment of Mons. Righini, of Poleggio (Tessin), where I have found beautiful queens at this season at a price of 3.50 francs, and Italian swarms at 10 francs.

I forgot to tell you that the practice of nourishing with sugared milk, more especially in the spring, for building and the development of laying, is spreading fast with us. R. Horner, Président de la Société Romande Fribourgeoise.—*Ibid.*

WHEN AND HOW DO BEES DRIVE THE SUPERFLUOUS WATER FROM THE NECTAR?

In the *Bienung Zeitung* of last year the following question was proposed:—What is the true cause that bees throw themselves close to the entrance hole almost immediately after receiving food and still make sorties, notwithstanding the darkness?

This question not having yet been answered by anyone, I beg to offer some observations which might contribute towards its solution.

What we have long supposed, *apropos* of this question, is now confirmed by the observations which Dr. Andr. de Rauschenfels, of Parma, has published in the *Bienung Zeitung* of Eichstädt.

In Italy the year 1878 has been as bad for apiculture as with us, but for a very different reason. It was very dry there. From the month of May to the middle of November not a drop of rain fell, and the honey gathered by the bees at the end of April and the commencement of May was already consumed by the first fortnight of August. So much so that, in order not to lose the hives, artificial feeding was resorted to. Dr. de Rauschenfels determined to use, as artificial food, the juice of a melon (obtained by pressure), which he placed at some distance from the apiary, and which the bees hurried to store up. On this occasion Dr. de Rauschenfels made the remark that the bees which returned threw away, when at a distance of two or three metres from the place where they had taken the melon juice, at least one-third of the juice, and naturally the part which was most liquid. When he followed, in the direction of the setting sun, the bees which had flown out, he saw a fine rain falling, like that which one sees dropping from trees when the leaves are covered with plant-lice.

It is known that the nectar of flowers contains about ninety per cent. of water, and honey only about twenty per cent.

It is probable, then, that this difference of seventy per cent. is lost either by expulsion from the body of the bee or by evaporation in the hive. It would result from the observations of Dr. de Rauschenfels that, immediately on its return, the bee rejects a part of the liquid food (and without doubt, also, of nectar). This separation cannot take place but during flight, or, at least, it is greatly facilitated by flight. This want of rejecting some of the liquid during flight is without doubt the reason of their precipitate sortie after feeding.

For a considerable time we have doubted this fact, and it was for this reason that we proposed the question. This accounts for food which is too liquid, and contains but little sugar, is left untouched when deposited in the hive, but is consumed quickly when placed at some distance.

In giving publicity to the above we think we have furnished some new matter for thought for the still unsolved question: How is nectar transformed to honey?—P. Ritter, *Schweizerische Bienen Zeitung.*

THE TEN ARTICLES OF M. ULIVI'S THEORY.

1. The connection of the queen with the drone takes place *regularly* in the hive, and exceptionally away from it, when drones are wanting in the hive.

2. Away from the hive the connection does not take place in the air, during flight, as the inventors of the so-called "nuptial flight" affirm, but on some object, or even on the ground; in the hive it takes place on the combs.

3. It is done by simple and almost imperceptible contact.

4. The drone does *not* suffer any loss of genital organs, and does *not* die in consequence.

5. It does not take place once only in the life of a queen, but several times; very often, in spring and summer, a repetition is necessary.

6. The pretended wedding flight is nothing but a flight for purification's sake or exercise, that the queen takes just as do the workers and drones.

7. That which queens carry on the abdomen on their return from this flight is mere excrement, and not any part of the drone.

8. The queen alone lays all the eggs; these, like the eggs of certain butterflies, cannot be transformed to larvæ if not fertilised.

9. If a perfect virgin queen lays eggs, these eggs produce no larvæ, either male or female.

10. The hatching of virgin eggs, whether of worker or queen, is a veritable chimera.—*L'Apiculteur.*

DO WORKERS EVER LAY DRONE EGGS?

M. Arviset continues the recital of his experiences. We gave the account of Experience 1 in our last number.

The 28th June.—Still no eggs laid, and the workers continued to pursue the queen, and to seize the eggs which she dropped from time to time without placing them in the cells. I could not see what the workers did with these eggs. I supposed that they carried them into the hive or ate them. Later on I examined the hive and found no trace of brood in it, which proved that the bees did not carry the eggs, or, at least, not so far as the empty combs. On this point the bee is not as intelligent as the ant. (Remark by M. Hamet:—It is the nymphs and not the eggs which the ant carries).

On the 29th the queen found herself on the comb containing large cells; she remained in nearly the same spot, surrounded with workers who troubled her no longer. I imagined something important was about to happen. On the 30th several eggs were laid in the large cells; then the workers surrounded the queen with still greater care.

On the 31st the number of eggs laid was great, and I saw the queen laying them in the drone cells. On the 2nd July the box was full of bees, working hard in wax, mending and arranging the comb, and enlarging it by adding smaller cells. The queen laid eggs in these smaller cells; often she did not wait for a cell to be finished, but dropped an egg into it. On the 4th the queen made a tour round the combs, visiting the cells to see if they were full; if she found an empty one she dropped an egg in, the workers making way for her as she travelled along. The light produced by suddenly raising the shutter of the window did not trouble the queen in her progress, nor the workers. It is always better to open the lid slowly and without a sudden jerk.

The work in wax continued rapidly; every bee was hard at it; it was beautiful to see. They mashed and kneaded the scales of wax which they took from the abdomen, and applied it to the cells already in course of building, bee succeeding bee, continuing and perfecting the work. Some bees were observed to be stationary. They waited, without doubt, until their scales were matured; that is to say, ready to be extracted. There were some who could not place their material on the walls of the cells, because other workers labouring there pressed them against the sides of the frames; others, again, were satisfied with merely placing their wax on the walls of the cells, leaving other workers to finish it off. They appeared in a great hurry to fly out to the fields. In fact, workers in wax are not the last to gather the booty. I have often been surprised to see them on flowers which had wax scales very apparent.

I had purposely used irregular comb foundation, having one side a little crooked; the bees, in prolonging it, had glued it against the glass, which permitted me to see them at work as much in face as profile. Twice I opened the window, and, consequently, twice broke the comb attached to it. I took away the piece which was glued to the glass on purpose to see the bees re-commence their soldering, which they hastened to do.

On the 5th July the hive was nearly full of brood, except above where the bees stored honey in the whole length of the comb. The cells were only half made where the bees deposited honey, which did not prevent their finishing them later. Some bees carried propolis, which they placed in small heaps here and there against the sides; some of these could not extricate themselves from it, they had to wait until the interior heat had softened it. Others carried pollen, which they stored in the small cells. The queen continued to lay, now here, now there, in the cells which she had overlooked in her first tour of inspection. Twice I saw her withdraw her abdomen from a cell, having an egg glued to the upper side of the extremity; by this fact there were none laid in the cell which she had just quitted. This is one of the causes why two eggs are sometimes seen in the same cell; but the queen can also lay two consecutively; in this case, however, they are glued together. The nurse bees take care of the little ones, bringing them their food. Some of these remain much longer in the cells than others.

I cannot tell the reason of it. On the following days the bees sealed over the honey and the brood: the caps of honey are of

white colour, and there was a brood of yellow. Then came a species of white-washers, who place over the combs a coating of paint, which is nothing else than a sort of propolis prepared for this object. It is a pleasure to see them move when they apply this paint, which renders the cap and combs more solid. (Remarks by the Editor of *L'Apiculteur*:—Has M. Arviset really seen this? Has he used a magnifying glass which has shown him the reality of this? Has he introduced a thermometer in the place where the honey was, and another near the brood, so as to make sure that the temperature was the same? The thermometer near the brood should tell him that the temperature was higher there than elsewhere, so as to aid the transformation of grubs into nymphs, besides helping the bees to strengthen the walls and caps of the hives containing the brood, their object being to cause these cells to obtain the greater heat necessary for brood. From this he should have concluded that it was a *coup de feu* and not paint which was used to burnish the wax.) I preserved during the winter combs of two sorts—the honey leaked from the white comb which had not received this coating; it leaked less from that which had received it. This operation colours the honey and renders it more hard to the taste.

On the 12th of July everything went on as on the preceding days. The queen had a louse upon her, and I noticed that several of the other bees had them also, and that they took much trouble to get rid of them, which showed that the lice worried them. But rarely did they aid each other in the task.

On the 21st several bees were born and were continually being born. The empty cells were cleansed, and immediately the queen laid fresh eggs in them. I noticed that the furnished cells had a little hole in the middle of the cap; these cells contained grubs or nymphs which had died after their complete development. One must believe that the bees perceived this accident, for they took them out and carried them away.

On the 24th I raised the glass and cut away from the middle of the comb a piece six centimetres square, and I replaced it with some comb containing large cells. The bees mended the comb, and the queen soon laid there.

On the 27th some drones were born, some black, some yellow. I saw some of them, besides some workers, which had much trouble to leave their cells; others remained there more than half an hour. It is said that bees never help each other. I, on the contrary, have seen workers busy nibbling the ends of the cells to help the brood to make an exit, but the case is rare. As soon as the young bee comes out she walks amongst the others, shaking herself from time to time to unglue her wings and dry her body. The other bees did not at first appear to take any notice of the new-comers, but some moments afterwards they aided them to make their toilet, brushing them with their tongues, and using their mandibles to unglue the wings. The weak ones were driven without pity from the hive.

On the 4th of August, seeing that the queen had no more room to continue laying, I made her pass into the lower hive and cut off the communication. She has since layed in this hive, where she has found numerous cells at her disposition. In the upper hive the bees filled the cells as quickly as the brood came out. I left this another twenty-six days on the hive to give time for the workers and drones to be born. On the twenty-first day the workers were all born with the exception of a few who came out on the twenty-second day. After this complete hatching the bees transported the honey from the upper to the lower hive, to the place which they used for winter storage. The last drone brood in the upper box was abandoned or destroyed, while the adult drone in both hives were gathered together on the grating.

SECOND EXPERIENCE.—This was made with a first natural swarm.

I took possession of the queen in hiving her, and placed her in an observation box furnished with comb foundation containing large and small cells. As there was no brood in the hive I thought that the bees would soon have joined the queen in the box. But, no; probably the spaces of the grating bothered them. A great number of the bees, about half of them altogether, returned to the old hive; enough remained, however, to experiment with. I ought to have been able to avoid this inconvenience by putting the swarm in the place of the original hive, and this latter in some other place; but I was not prepared for what was to follow.

On the next day, 29th June, the box contained about 200 bees, about a twentieth part of which surrounded the queen, who remained quiet on the combs, but as yet laid no eggs.

On the 1st July there was quite a crowd of bees in the box, and they worked hard at the wax, and I saw the queen laying in the large cells. The next day she laid in the small cells. On the 10th, seeing that she had no further place in which to dispose her eggs (the observation box was much smaller than the hive), I gave her liberty to go below; nevertheless, she remained for two days where she was. In the first experience the same thing happened; I was obliged to force the queen into the hive. This makes me think that queens leave their brood with reluctance, and that they do not wish to lay in the supers when there is unhatched brood in the hive.

(Note by M. Hamet: Queens easily pass into the supers to lay eggs there when honey is scarce.)

On the 13th there were a few bees above, and on the 14th they had entirely abandoned the box, as well as the brood, and had descended to rejoin the queen. In this second experience, as in the first, I have seen the queen laying eggs which produced drones; but in all my frequent visits I never saw workers lay.—*Ibid.*

WHAT SHALL WE PUT WITH WAX TO MAKE THE COMBS TOUGH?

IN the October number I noticed the enquiry:—"What do the bees do with the fur they nibble from each other? And why are some combs dark coloured when they are built?" You seem anxious to investigate the cause, and therefore I will give you my observations in relation to it.

Last April, after setting my bees out from the cellar, I fed a weak swarm with flour candy, to induce breeding. I put it in a small frame, such as I use in the upper half story, five inches deep, with an ounce vial filled with water, cork, and wick. They took it readily, and began to build comb of brown greyish colour, very tough and tenacious. It would bend without breaking. After building about three inches in diameter and filling it with eggs, they continued to build below the frame to the bottom of the hive, and raised a fine comb of brood before there was any in other combs. I have never noticed anything like it before or since. It appeared strange to me, and I thought at the time I would write you about it, but have postponed it.

Now if you could make foundation out of such material, what an improvement it would be to prevent sagging! I have been using soft carpet paper nailed to frames for division boards, but found the bees cut it to pieces so badly, I had to abandon it in a measure. A good deal of the fibre was found in and about the hives. Did the bees use it to mix with wax for brood combs? Did the flour candy have anything to do with it? If you would obtain some fine pulp from a paper-mill and incorporate it properly with the wax and work it for foundation, you would get the result.—R. A. PRUDDEN *(Gleanings)*.

WHAT BECOMES OF ALL THE DRONES?

JUDGING from what has been published of late on the subject of drones, the question as to how long these live under ordinary circumstances, the manner in which they perish, &c., is still an open one. In August last some beautifully-marked drones were hatched in one of my colonies, the progeny of an extra fine queen. The colony was fed daily, and the drones were permitted to go in and out as in the height of the swarming season. In less than thirty days from the time they took wing not one drone could be seen, although the weather was beautiful and warm. If their home became intolerable to them, by reason of persecution, they might have taken shelter in at least two other colonies, which retained a succession of drones, but not one of these finely-marked drones was to be seen anywhere. If drones live as long as the authors of bee literature would have us believe, what became of my finely-marked pets?

Now I claim to have made something of a discovery. I think I may assume this much, as I have never seen anything in print concerning what I am going to suggest. It is now well understood that if the abdomen of a drone is pressed between the thumb and the finger he will explode with a convulsive jerk and die instantly. No one can try the experiment without being impressed with the suddenness of the death which follows. I have for a long time been of the opinion that this curious feature in the organism of the drone is no mere accident, but the handiwork of an all-wise Creator for a wise purpose, though we may not fully understand it at the present.

Can it be that a beneficent Creator has provided the drone with a means of his own destruction, as some compensation for his hard lot? Whether or not the poor drone, when driven from

home, outlawed and persecuted, "having nowhere to lay his head," can "burst," quiver, and die at his own option, I am not prepared to say. But one thing I know, and that is that drones do, at certain times and under certain circumstances, burst like the ripe pods of the "touch-me-not," while on the wing, and fall lifeless to the ground without any apparent cause, except that it is their nature to do so. This, I think, accounts for the sudden disappearance of drones when no succession is kept up.—G. W. Demaree *(Ibid.)*

SUNFLOWER AS A BEE FOOD.

I wish to call attention to the mammoth Russian sunflower as a bee plant. I have taken special pains this season to test its virtues as a forage plant for bees. I planted a plot of it the same time I planted my corn, and treated it similar to the corn, as to cultivation. It has now been in blow some two months, and the bees have been very busy since then, securing both honey and pollen. It is interesting to see with what vigour they work in securing pollen from it. It is the only recourse they have now, as a week since we had a frost here that destroyed what else they had access to, but the sunflowers were not harmed, and will probably blossom two weeks yet. I shall plant more next year, as they (the seeds) are valuable for horses, cattle, &c., possessing properties similar to oil-cake (flax seed). Chickens are fond of them, and they are superior to corn for egg production. The yield is about the same as corn. I have some heads as large as a five quart pan. The early part of the season was favourable here for bees; in fact, white clover never yielded better, but the last three months has tried weak ones.—S. A. Walrath (*American Bee Journal*).

ATMOSPHERIC FEEDER.

I have a very convenient atmospheric feeder, made of two oyster cans, one three-quarters of an inch larger than the other. I make them myself. I can make one in about five minutes. The cans cost nothing but picking up at the hotels; they work perfectly inside or out. The feeders are made by melting off one end of each, filling the small one; turn it bottom up in the large one. After, cutting a hole in the large one ½ by 1½, and ½ inch from the bottom for the bees to enter. When used outside make it so that the bees can enter the hole from the entrance, and none get in from outside, and put a cover on the outside can. The cover is made by cutting off the can same size, cutting the rim, which is ½ inch deep, about every inch pressing out the rim so as to open the cuts a little, and it will slip on and answer just as well as if made by a tinner.

Perhaps this may help some to keep combs from melting down. My Langstroth hives are made with ventilators in the centre of the bottom 3 by 8, and covers nailed at each end to pieces 1 by 3, and when the hot weather comes I raise up the covers by nailing a lath on the under edge of the end pieces, at each end, and putting it on top of mine, putting on burlap sacks, so that the cover is three inches above the sack. I have never had but three combs melted. I acknowledge that I am greatly indebted to our bee-keeping friends for many valuable hints, and although other bee papers are good, still, the "old reliable" keeps the lead and still improves.—S. S. Butler, M.D. *(Ibid.)*

DYSENTERY AND WINTERING.

Is there such a disease among bees as dysentery? I answer, No. I am well aware that nearly every writer on the subject for the past ten years has told us that there was such a disease, and has attributed the cause to cider, honey dew, extreme cold, old bees, &c. But let us look at the thing rationally, and see if all these writers have not been mistaken? Do we see the bees soiling their combs and hives at any other time except after a long-continued confinement? If we had June weather steady for one year, would the bees die of the so-called dysentery as they did last winter and spring? Of course not. Supposing a person, from some cause, was obliged to retain all he ate for ten days or two weeks, and after nature gave out would not any doctor in the land say he had the dysentery? No. So, then, we see as nature has made it a necessity for bees to fly to void their fæces, that it is their being obliged to stay in their hives longer than nature allows that causes this so-called dysentery. If this were not so, why do we read many times, by various writers, "My bees were suffering badly with dysentery. When a fine, warm day came they had a good fly, and now they are all right." Can the reader understand how a bee just ready to die with such dangerous disease can be cured of such an epidemic by a few moments' flying only on the grounds above given? That Nature has made the bees capable of containing their fæces longer during confinement in cold weather than in warm, is a self-evident fact, for bees will soil their combs and hives in one-fourth the time with a temperature of 70 deg. than they will with one of from 10 deg. to 40 deg. It is just this principle, that bees control their excrement for a long period of time during cold weather that enables us to keep them at all here at the North. Believing the above to be correct, our our next point to be considered will be

WINTERING BEES.

Having admitted that long confinement was the cause of the great mortality among bees in the past, let us see what can be done in the future, to help the bees control their fæces during such winters as the winter of 1878-'9 proved to be. Now just see how all agree on this wintering question. Having once taken this view of the matter all is harmony, and the theory of each writer on the subject of wintering proves correct. Let us notice some of these, for we have nothing new.

First.—Cellar wintering has proven about the best plan. Why? Because from the even temperature of the cellar the bees need but little food to keep up the necessary warmth they require during this period of partial inactivity which winter compels them to pass through. As but little food is required, the body of the bee easily contains said food after digestion, and thus all goes well.

Second.—Chaff-packed hives on summer stands are advocated by nearly as many as cellar wintering. Why? Because as the bees are surrounded by porous walls, which takes off the moisture passing from the bees' bodies, also retaining the warmth generated by themselves, they are kept at a more uniform temperature than they would be without the chaff-packing, thereby lessening the consumption of honey, and enabling them to throw off a part of the moisture contained in their food, and to contain the rest till the weather shall be sufficiently warm for them to fly. This mode has a seeming advantage over cellar wintering, n that it allows the bees to fly if an opportunity permits during winter, but is off-set by a more uniform temperature, and a consequent decrease in the consumption of stores in the cellar.

As these two plans are about the only feasible ones, let us next look after the other causes which help these plans to be a success or failure. Those looking towards a failure are these:—First, poor honey, such as honey dew, cider, soured and unsealed stores, &c. Why? Because the bees have to take into their bodies an excess of that which is not really good to them to sustain their existence, thereby distending their bodies, and unless a chance to fly presents itself often they must die in a loathsome condition. Second, all causes which disturb them in their winter repose. Why? Because as soon as they are disturbed they take into their bodies more food than is required for their existence, thus placing them (with the best of food) in the same condition they would be with poor honey. So we see how important it is that they should have perfect quiet, that no mice or rats are allowed in or on the hives, or that the temperature of the cellar does not get so high as to make them uneasy. Third, but few bees, or mostly old ones. Why? Because if but few bees, they cannot keep up the desired warmth without consuming an undue quantity of food, and thus thwarting our object; and if old bees, they will die of old age before the young ones in sufficient numbers hatch the next spring.

Those looking towards a success are these:—That those in the summer stands have a fly once in six or eight weeks; that each hive contains an abundance of bees and good sealed honey, or sugar syrup made of "A" coffee sugar, a good queen, a hive so that the bees can cluster compactly, &c. Why? Because all these things have a tendency towards accomplishing our object of keeping the bees in such a state of quietude that they can contain their fæces for a great length of time, for upon this hangs all the secret of successful wintering. "But," says one, "our bees died more rapidly last spring, from the middle of March till fruit bloom, with purifying flights from once in two weeks to every day, and that when fed on good capped honey, than they did at any time during the winter." Admitted; so did ours. The reason was this. Their vitality was so impaired by the strain brought to bear on them, consequent upon holding their excrement for nearly five months that they spring dundled, or, in other words, died of premature old age, Don't you think that the person spoken of at the beginning of this article would have been sick, and his constitution somewhat worn, if he had been compelled to contain all he ate for two-thirds of his natural life, as the bees had to last winter? Another says; "Can you tell me why bees

now die in spring of old age more than they did years ago?" I lean tell you what I think the reason is; it is this: Our timber and has been so cleared off to meet the demand for nice houses and costly furniture, that the winds sweep the country almost unobstructed, making the state of New York nearly as bleak as the Western prairies. This causes two things—first, a greater amount of food to be consumed to keep the desired temperature; second, we have many days when it is warm enough for bees to fly that the high winds prevent, while if in a sheltered nook, with a wind-break 100 feet high, they could fly nicely, and we go to bed at night feeling that the bees are in fine condition to stand another cold pull, instead of knowing that the bees must perish if a warm day does not soon come without wind. We had two days last winter prior to the 10th of March that bees could have flown nicely had it not been for the wind. To illustrate, when friend Betsumger lived at Marcellus Falls, he was in a narrow valley, with hills rising each side upwards of 100 feet, On one side the N. Y. C. R. R. threw up an embankment nearly as high as the hills, and on the other there was a point of rocks that jutted out half way into the valley. In this place his bees could fly when mine were kept in by the high winds. In 1872, when we had our former disastrous winter, friend Betsumger lost scarcely a swarm, nor did he lose any to speak of while there, but since he has moved to a higher altitude, where the wind rakes, as it does in most places, the country over, his losses are equal to those sustained by any of us.—G. M. DOOLITTLE (*Ibid*)

HOW TO SECURE THE LARGEST INCOME.

OF a given number of beekeepers only a small number can pursue specialities. All cannot publish bee-papers, manufacture supplies, or rear queens, and make a living at it. I have given up all other business, and devote my entire time to the apiary. I have no patent hive to sell, neither bees nor queens, nor anything but the one item, honey. As a representative, therefore, of the mass of beekeepers, I ask the question, How to secure the largest income? Not because I think I can answer it, but because I honestly and anxiously desire light upon it, such as may be brought out by discussion. I am very well aware that the question is a very comprehensive one, and may really embrace the entire subject of beekeeping; but aside from the topics discussed in the books, there are several points upon which light may be thrown by the experience of the veterans in the business. Some of these points I may be allowed to suggest.

Prominently comes up the question, "Shall I devote my entire time to the apiary, or shall I attend to some other business in connection therewith?" For many years I kept a few bees, devoting part of my leisure time thereto, and found it very pleasant; but after the number of colonies increased to 100 to 200 it was not so satisfactory, and for the last year or two I have given up all other business to solve the problem whether my bees would furnish me with bread-and-butter—a problem not yet fully solved.

Is there any limit to which increase of colonies can be profitably carried?

What is the limit of colonies in one apiary?

Shall I attempt to keep more than one apiary?

The general teaching has been that about 100 colonies are enough for our location. Undoubtedly the pasturage has much or all to do with this question. I have some 200 colonies in my apiary, and I am really uncertain whether less would be better, or whether double the number could not find enough pasturage on the same ground.

Will it pay to raise crops especially for honey?

I have sowed a good many pounds of alsike, with poor results so far; but the seasons may have been unfavourable for growth. I am of opinion that if I had this year sowed several acres of buckwheat I should have been the gainer by it, for although buckwheat honey brings a low price, it comes at a time when it can be laid up for winter stores, and if any surplus is taken it is so much clear gain, provided no other plants are yielding honey at the same time. Melilot, catsnip, &c., have their advocates; but can anyone from actual experiment give us proof that either of these can be profitably planted by the acre?

Passing by the question whether honey shall be in the comb or extracted, foundation used or not, and if used, whether only for starters or full size of surplus box, I come to the important and somewhat perplexing matter as to the disposal of the honey. Much good advice has been given as to developing the home market, to which I give a hearty assent, but I am sure it is not to the interest of every large producer to depend entirely upon his home market. So long as I can get nearly or quite double as much for my honey in New York or Chicago as I can in the markets near home, I shall not spend much time in the business of development. I believe it is to the interest of beekeepers that honey should become a staple article, so that there shall be some uniformity of price in different places, and not, as I have known the present year, honey sold at 10c. per lb. in one town and 20c. in another town twelve miles distant. Probably in time this matter will regulate itself, but a little concert of action may hasten it.

It is only recently that honey is found quoted in the market reports, but it is now considered of consequence enough to secure a regular quotation in some of the leading daily papers. I am of the opinion, however, that the quotations generally given are not in the interest of those who produce the honey, their tendency being to "bear" the market. We should look at least for reliable quotations in our own bee publications; but they are just as reliable as the dailies and weeklies.

Another trouble is the large number of houses at which honey is sold in our cities. Most of them know little about honey, and a really nice article will be sold for about the same as the poorest. The producer should know something about the actual state of the market, and when he makes a shipment should send instructions not to sell below a certain price, unless he has perfect confidence that the consignee is fully posted and will get full value. Is it not better to ship to a house which makes a speciality, if not a sole business, of selling honey?—DR. C. C. MILLER (*Ibid.*)

TO FIND A BLACK QUEEN IN THREE MINUTES.

I allow myself three or four minutes to hunt up a black queen at this season of the year after the honey season is entirely over. I have but three frames to examine, and can frequently lift up the frame she is on at the first attempt. To do this the hive must be prepared beforehand. I first lift the honey board, and if there has been a space of more than 5-16ths allowed between the board and the top of the frames it will be filled with comb and honey; I then prop up the honey board about three or four inches, and close the hive until the bees have cleaned off the honey. As soon as this is done I carry away the honey board out of sight of the bees, and have a clean one ready to take its place. I now clean off the tops of the frames, and cut out the fastenings between the frames, collecting carefully all the pieces of wax and putting them out of sight. I then loosen all the frames, and draw over towards the cool side of the hive all the frames but three, on one of which the queen is to be found. In drawing them over I arrange them so closely that a bee can just pass between them; this will leave a space of over one inch between the main body of the frames and the three that are on the warm side of the hive. In arranging the frames in this way, should it take more than four or five minutes, I make two operations of it. The bees are now ready to be fed. I use a very small feeder, preferring one holding not more than a gill, as the feeding must not be over-done. I place this feeder exactly over the centre of the middle frames of the three, and feed regularly every night and morning, and on that middle frame the queen will commence laying, and can easily be found, especially after the eggs begin to hatch. I have fed in this way in the evening, and found the queen laying prolifically the next day.—C. W. TAYLOR. (*Ibid.*)

BEES CARRYING CANDY OUT OF HIVES.

About a month ago a gentleman told me that he intended to destroy several colonies of black bees he had in order to start in the spring with none but pure Italians. I begged for the little fellows to be spared, and he told me that if I would drive them out of the box hives I could have them. I did it at once, and as I had any number of queens, several of which were tested, I at once mixed two of his colonies, destroyed the black queens, and sprinkled all, even the new-tested Italian queen, with peppermint syrup, shook them lively in a box, and emptied in front of the hive.

The queens were received in good order, and fearing they needed help I gave each colony one frame of nice pure coffee "A" sugar candy. Honey was not coming in to amount to anything, yet the bees commenced picking that candy out, and are at it even yet.

I took out one frame and gave it to a colony of pure Italians, and they seemed to understand that it meant business, and cost 10 cents per pound, and was too good to waste; they carried it into their cells lively, not taking one particle outside of the hive.—R. C. TAYLOR. (*Ibid.*)

EXPERIMENTS WITH EGGS AND LARVÆ.

I gladly comply with your request to report my experiments with eggs and larvæ, and will give the detail of a few, and results gained up to this time. As I have previously stated through the *Exchange*, my attention was turned to experiments by accidents which happened in May and June. About the middle of May I discovered that full-grown drone larvæ would cap over and gnaw out in a moderately warm room, and that some eggs which had been laid in sections of drone comb, and had been out of the hive from Monday till Saturday night, were found hatched the Monday following, and had not been in the hive 40 hours, an impossibility with a new-laid egg; and they will not hatch in less than 60 hours, and are usually 72 to 80, according to the weather. The section-box incident happened in the apiary of Mr. C. A. Stone, in June, and I saw the boxes in each change that was made with them. This gave me the first link in the chain of experiments with eggs. The first one I wrote to was J. H. Nellis, June 30; he shipped me some brood July 2, taken from the hive at 12 a.m., arriving at 3 p.m. July 4; one-half was put in at 6.30 p.m.; one-quarter at 8 a.m. on the 5th, and the rest at 7.30; the piece was 4½ by 2 inches, cut into four pieces. The two pieces put in on the 4th—they started seven cells on the other three cells. On the one put in on the morning of the 5th they started two cells; on the one put in on the evening of the 5th they started five and deserted two. The ten cells started on the pieces put in on the 4th were torn down by the bees, but the five that were capped on the two pieces that were put in on the 5th hatched; two were lost and three were mated. They were so near alike that without minute examination they could not be told apart. Three other times I sent to Mr. Nellis for brood. The second one was taken out at 9 a.m., on July 23d, and received the 25th at 3.30 p.m., but being considerably bruised was not accepted by the bees. The third was taken from the hive on August 5th, at 2 p.m., and was received at 7.30 p.m. on Aug. 7. It was put into a nucleus at 9 a.m. on the 8th, and taken out on the 9th for 36 hours; then put into another. One-fourth of the brood came out perfect bees. The fourth piece from Mr. Nellis was sent on August 15, and received on the 16th. A few cells were built, but the queens became barren on account of rainy weather when old enough to mate.

I sent to A. I. Root three times for brood. The first was sent on the 6th, received the 8th. The nucleus was not very strong, and was robbed; then the brood was shifted, but was pulled out by the bees. The second time he sent me two pieces, 2 by 3 inches, Aug. 14; received at 3.30 p.m., Aug. 16. They were both pressed into a box made for only one, and were useless. The third sent by Mr. Root was taken from the hives at 2.30 and 2.35 p.m. on Aug. 19; received at 3.30 p.m. on the 22nd. Both were larvæ, and were given to the bees at 6.30 p.m., but were allowed to starve after being in the hive over 48 hours, and I could discover no cause for deserting it. I never knew bees to do so, either previously or since.

The first piece sent from the *American Bee Journal* apiary, from an imported queen, Aug. 26, by express, received the 29th, remained in the hive unchanged till Sept. 2, and since then one egg has hatched into drone larva. The second piece you sent Sept. 10, arrived 13th, but I was away, so it was not given to the bees till the 15th; but the eggs were all pulled out on account of having perished from exposure to a dry, cool atmosphere for about thirty-six hours, the first that have perished from that amount of exposure.

There are many more experiments, but I will not give them all in detail, only giving in full the different modes of inserting the brood. The first trouble is to give it the same scent as the hive into which it is inserted. Second, the bees will pull out both larvæ and eggs after the comb has become very cool or exposed to smoke of any kind, or if it has any animal or other foreign smell. Third, after the larvæ have consumed the fluid so as to become dry, it will be pulled out; and fourth, a heavy flow of honey will excite them to pull it out every time within twelve hours of insertion.

To insure the bees accepting brood, first give it the scent of the hive. If eggs from a choice queen are used, put a piece of wire cloth over the comb till they begin to hatch, or in any other way give it the warmth and scent of the hive, and if the larvæ has become dry moisten carefully with tepid water and honey, and when warmed let the bees have free access to it with perfect safety, and if the bees to which it is given are not more than four days hatched, they are better in a good flow of honey; but if honey is scarce, at least two-thirds should be over twelve days old, with hatching brood to come on as fast as the old ones die off.

Pure Italians take either eggs or larvæ better than the blacks; but hybrids are not usable in cases where brood has once become cold, though they will start the most cells and rear the strongest queens every time; but they will tear out eggs or larvæ as fast as you can give them either.

The oldest piece of eggs that a cell was started from has been about five days and two hours as near as time agrees, and the longer the eggs are out of the hive, the longer the bees are capped, queen-cells extending to the 11th day, and workers to the 24th day. Seven days keeping worker-eggs has resulted in ¾ drones.

Queens reared from eggs or larvæ kept from the bees for any length of time not only makes them remain in the capped cell, but makes them longer about mating and laying, and, though they are rather slow layers, they keep steadily at their business, and close watching seems to make no perceptible difference with them; and I cannot see that they are in any way less valuable than other queens. Drones act considerably more sluggish when reared from larvæ or eggs kept long from the hive. From 24 to 72 hours keeping of eggs seems to make no perceptible difference; but when more than 72 hours out of the hive they are longer hatching.

Capped worker brood has gnawed out 58 deg., but were very weak and soon died. Drones emerging at the same temperature, when put into a nucleus, appeared as lively as any others, and seemed to live as long.

Queens emerging at a lower temperature than 65 deg. to 75 deg. never mated, and often died within thirty-six hours after gnawing out.

Queens that were hatched away from the bees and kept away from them, except three or four put in the cage to feed them, and kept in a dark, warm place till four or five days old, and then put on a frame of hatching brood, were invariably mated the second or third day after, if it was at all, clean through the last of June, July and August, and a less proportion will be lost than if reared in the ordinary way in a nucleus.—H. L. Jeffrey (*Ibid*).

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 apiarians.

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

No. 1 (page 28), Ignoramus.—Through the kindness of the Rev. J. B. Noyes, of New Town, Southborough, Tonbridge Wells, we are able to give you some further elucidation of the questions you proposed. Mr. Noyes writes us as follows:—

In your first number you inserted a query respecting the account in Judges xiv. of the swarm of bees and honey in the carcase of the lion slain by Samson. May I add to the remarks you made in reply that the expression, "after a time," is literally in the Hebrew text "after days," which sometimes signifies a year (see Exodus xiii., 10, &c.). From the words "he turned aside to see the carcase of the lion," it would seem as if, when he slew it, he threw it a little out of the road, perhaps among some bushes (so Josephus). In course of time the flesh would be eaten away by birds of prey, ants, &c., and this would become, before Samson returned a year later, a very convenient receptacle for the swarm to settle in and build their combs. Hero-

dotus relates that bees took possession of the skull of Onesibus, King of Cyprus, when hung up and dried.

No. 9 (page 29), Rev. D.—The work you mention, "The Modern Art of Breeding Bees," is a poem of about 500 lines. It is written by Joshua Dinsdale, A.M., and was "printed for Joseph Davidson, at the Angel in the Poultry, MDCCL." It shows a considerable knowledge of the habits of the bee, and is pleasantly written.

No. 33, J. R., Glasgow.—I found the queen sent you by this post dead on the landing-board of one of my hives, which I understood had at its head a queen of last year's breeding, the stock being composed of two second swarms joined. Would you be good enough to dissect, and let me know through the columns of this month's BEEKEEPER if the queen sent was fertile and likely to be the original queen of the stock? If so, what ought I to do to preserve the stock? Mr. John Hunter has been good enough to make the dissection for us.

Answer to No. 33.—Microscopic examination of the sexual organs of the queen received proves that she was undoubtedly fertile, but from the date you supply it is impossible to say if she is the original queen of the stock, or the cause of her death. The body being very dry and brittle leads us to suppose she had been dead some months; if so, probably her bees supplied themselves with another queen before all the drones were gone, and in that case the stock may go on all right; but if the stock be now without a queen, or has an unfertile one, its salvation is hopeless, as, if any bees survived till spring, they will be so old and number few, that, even if a queen was supplied them, they could not thrive. Had the year been two months younger, we should have advised the stock be united to another, but the winter is too far advanced and cold to adopt this course now. It may be done in February with what few bees remain, if the weather be mild. Mr. Rait, in the columns of the *Journal of Horticulture*, gives it as his experience that deposed queens are nearly always found deficient in their limbs—in the case of the queen under notice we find three or four feet missing, but these injuries may have occurred since death.

LITERARY GLEANINGS.

THE SPIDER AND THE BEE.

BY SWIFT.

THE following extract from "The Battle of the Books" had reference to the great contest which was in Swift's time going on between the advocates of ancient learning and modern learning. The bee represents the ancients—the spider the moderns. The Apologue of the spider and the bee was not unjustly applied, some years ago, to a coterie of self-applauding writers, "furnished with a native stock," who, despising accuracy and careful investigation, turned up their noses at those who were labouring to make knowledge the common possession of all:—

Upon the highest corner of a large window there dwelt a certain spider, swollen up to the first magnitude by the destruction of infinite numbers of flies whose spoils lay scattered before the gates of his palace, like human bones before the cave of some giant. The avenues to his castle were guarded with turnpikes and pallisadoes, all after the modern way of fortification. After you had passed several courts you came to the centre, wherein you might behold the constable himself in his own lodgings, which had windows fronting to each avenue, and ports to sally out upon all occasions of prey or defence. In this mansion he had for some time dwelt in peace and plenty, without danger to his person by swallows from above, or to his palace by brooms from below, when it was the pleasure of fortune to conduct thither a wandering bee, to whose curiosity a broken pane in the glass had discovered itself, and in he went; where, expatiating a while, he at last happened to alight upon one of the outward walls of the spider's citadel, which, yielding to the unequal weight, sunk down to the very foundation. Thrice he endeavoured to force his passage, and thrice the centre shook. The spider within, feeling the terrible convulsion, supposd at first that nature was approaching to her final dissolution; or else, that Beelzebub, with all his legions, was come to revenge the death of many thousands of his subjects (Beelzebub, in the Hebrew, signifies lord of flies) whom his enemy had slain and devoured. However, he at length valiantly resolved to issue forth and meet his fate. Meanwhile the bee had acquitted himself of his toils, and, posted securely at some distance, was employed in cleansing his wings, and disengaging them from the rugged remnants of the cobweb. By this time the spider was adventured out, when, beholding the chasms, the ruins, and dilapidations of his fortress, he was very near at his wits' end; he stormed and swore like a madman, and swelled till he was ready to burst. At length, casting his eye upon the bee, and wisely gathering causes from events (for they knew each other by sight), "a plague split you," said he, "for a giddy puppy; is it you, with a vengeance, that have made this litter here? Could you not look before you? Do you think I have nothing else to do but to mend and repair after you?"—"Good words, friend," said the bee (having now pruned himself, and being disposed to be droll), "I'll give you my hand and word to come near your kennel no more; I was never in such a confounded pickle since I was born."—"Sirrah," replied the spider, "if it were not for breaking an old custom in our family, never to stir abroad against an enemy, I should come and teach you better manners."—"I pray have patience," said the bee, "or you'll spend your substance, and, for aught I see, you may stand in need of it all toward the repair of your house."—"Rogue, rogue," replied the spider, "yet methinks you should have more respect to a person whom all the world allows to be so much your betters."—"By my troth," said the bee, "the comparison will amount to a very good jest; and you will do me a favour to let me know the reasons that all the world is pleased to use in so hopeful a dispute." At this the spider, having swelled himself into the size and posture of a disputant, began his argument in the true spirit of controversy, with resolution to be heartily scurrilous and angry; to urge on his own reasons without the least regard to the answers or objections of his opponent; and fully pre-determined in his mind against all conviction.

"Not to disparage myself," said he, "by the comparison with such a rascal, what art thou but a vagabond without house or home, without stock or inheritance, born to no possession of your own, but a pair of wings and a drone-pipe? Your livelihood is a universal plunder upon nature; a freebooter over fields and gardens; and, for the sake of stealing, will rob a nettle as easily as a violet. Whereas I am a domestic animal, furnished with a native stock within myself. This large castle (to show my improvements in mathematics) is all built with my own hands, and the materials extracted altogether out of my own person."

"I am glad," answered the bee, "to hear you grant at least that I am come honestly by my wings and my voice; for then, it seems, I am obliged to Heaven alone for my flights and my music; and Providence would never have bestowed on me two such gifts without designing them for the noblest ends. I visit indeed all the flowers and blossoms of the field and garden; but whatever I collect thence enriches myself without the least injury to their beauty, their smell, or their taste. Now, for you and your skill in architecture and other mathematics, I have little to say. In that building of yours there might, for aught I know, have been labour and method enough; but, by woeful experience for us both, it is too plain the materials are naught; and I hope you will henceforth take warning, and consider duration and matter, as well as method and art. You boast indeed of being obliged to no other creature, but of drawing and spinning out all from yourself; that is to say, if we may judge of the liquor in the vessel by what issues out, you possess a good plentiful store of dirt and poison in your breast; and, though I would by no means lessen or disparage your genuine stock of either, yet I doubt you are somewhat obliged, for an increase of both, to a little foreign assistance. Your inherent portion of dirt does not fail of acquisitions by sweepings exhaled from below, and one insect furnishes you with a share of poison to destroy another. So that, in short, the question comes all to this; whether is the nobler being of the two, that which, by a lazy contemplation of four inches round, by an overweening pride, feeding and engendering on itself, turns all into excrement and venom, producing nothing at all but flybane and a cobweb; or that which, by a universal range, with long search, much study, true judgment, and distinction of things, brings home honey and wax'

TWO OLD POEMS.

ADDRESSED TO MR. B——L* BY THE HYP-DOCTOR, 1735.

I.

YE Insects all, that fly or creep,
Assist my doleful ditty,
The fate of *Bee* defunct to weep,
Of *Bee* so *humming witty!*

It was a pretty little *thief,*
Most *innocent* of any,
And eke it plunderèd e'ry *leaf,*
To turn an honest penny.

For news and learning, great or small,
It *buzz'd* about to seek 'em;
And *honey* laid at top of all
To cover Album Græcum:

Squeez'd at a press, this *humble* bee
Can now no longer sing;
Thus *pointless* ends my elegy,
My wasp has lost her sting.

II.

THE BEES.—AN ANACREONTIC—1745.

Hail! thrice happy bees that dwell
Safe within your waxen cell;
Strangers to our present strife,†
Blest with balmy sweets of life.
Wars and factions with you cease,
Husht in harmony and peace.
Winter's rigid fare you flie,
And sleep 'midst our adversity,
When the sun's more pow'rful rays
Ushers in your golden days,
Then unlimited you rove
Thro' each fragrant, spicy grove,
Thro' each hyacinthine bow'r,
Take repast on every flow'r:
Bask it in the noontide heat,
Or enjoy a cool retreat.
Life's short space glides soft along,
By your drowsy, tuneful song;
Heedless how it steals away,
While on silver wings you play.
By nature arm'd you're wisely taught
To keep the affluence you have got;
"To covet neither pomp nor pow'r,
Contented with your present store."
Set th' ambitious to be great
Envy you in humbler state,
When he sees, with trembling eye,
Ghastly Death approaching nigh:
When pale sceptres round him dance,
"Is there, then, no help from Fr——e?"
Pluto yawns! he's hurried down
To dark regions—not his own.
There, ye Furies! *let him reign*
Highest o'er the rebel-train.

Hence the *bees,* whose wishes rise
No higher than their wants, *are wise.*
(For Providence hath wisdom giv'n
To ev'ry insect under Heav'n.)
Shall not *we* more nobly fight,
When they maintain their sovereign's right?‡
If not, ye powr's! by just decrees,
From men transform us into bees;
Then we'll act by nature's laws,
"Know our friends, but *sting* our foes."

* Mr. B——l is E. Budgell, the promoter and editor of a paper the imposing title of which was "The Bee or Universal Weekly Pamphlet—containing something to hit every man's taste and principles." It would have been a wonderful journal could it have kept the promises made in its title. The BEEKEEPER finds it difficult to hit the "tastes and principles" of two men only; what pleases one seems bound to offend another. "The Bee" had a short existence of two years—1733 to 1735. It consisted, almost entirely, of extracts from other publications; hence the jokes of "thief" and "leaf."

Eustace Budgell was a voluminous writer, but he will be chiefly remembered as the friend of Addison, and one of the authors of the "Spectator." He wrote part of the papers referring to the immortal Sir Roger de Coverley.—EDITOR.

† This poem was written December, 1745, four months after the landing of the Young Pretender, Charles Edward, in Scotland; two months after he gained the battle of Preston-pans, against Sir John Cope, one month before his victory at Falkirk, and four months before his overwhelming defeat at Culloden.

The sarcastic line, "Is there no help from Fr——e?" refers to the promise of help made by Louis XV., on which the Pretender was relying when he landed in Scotland—a promise never kept, even if there had ever been any intention of keeping it. We were at war with France at the time.

REVIEWS.

Les Nectaires des Fleurs, étude critique, anatomique et physiologique. By GASTON BONNIER. (Paris: G. Masson.)

THIS is a full and exhaustive work on the nectaries of flowers. The author has keenly examined every book that has previously appeared on the subject; has set forth the different opinions held by different writers; has carefully analysed these opinions and compared them with his own observations. It has evidently been the careful labour of years, and we recommend M. Bonnier's book to all who take an interest in the much vexed-questions of what the nectar of flowers really is, and whence it comes. The exudations of the leaves of trees, the insect formed, and other honey dews, are all treated of. There are several theories and propositions set forth by M. Bonnier which will, however, give much scope for discussion, and perhaps refutation, to other authorities on the subject. At a future day we hope to give our readers extracts from this valuable work.

Hydro-Incubation in Theory and Practice. By THOMAS CHRISTY, F.L.S. Fourth Edition. (Christy and Co., 155, Fenchurch-street, London. Price 1s.)

Now that artificial incubation has come so much to the fore, this book will be read with great interest. A concise history of incubation and the different methods adopted in early and modern times are given. The descriptions of Mr. Christy's own inventions and appliances are highly interesting, and the instructions given for their manipulation are full and clear, and are illustrated with many drawings. There is a chapter on egg-testing which should be found useful to all housekeepers, even if they do not keep incubators. There is also a long and highly-interesting article on commercial poultry farming, with hints as to how to prepare and pack fowls so that they may reach the market in an enticing and saleable form, not bruised and broken as they too often are. This book should be read by every keeper of fowls.

Seventy Pounds a Year: How I Make it by my Bees. By the late J. W. PAGDEN. Sixteenth Edition. (Mrs Pagden, Alfriston, Sussex. Price 1s.)

WE have received the sixteenth edition of this little work. One of our most extensive bee-keepers told us the other day that it was owing to an accidental perusal of this book (he had taken it as the first to hand while waiting in a room for a friend) that first led him to turn his attention to bee culture. It is addressed more especially to the cottager, and gives very plain instructions for the management of a small apiary. In the introduction the author writes: "In 1864 I recommenced keeping bees, and without any other outlay than twelve shillings, excepting what has been produced from the sale of honey. I have now, in 1868, nearly one hundred stocks, remarkably strong and vigorous, independent of a considerable balance of money in their favour." Let the wavering take courage, read this book, and go and do likewise.

The Beekeeper's Almanac for 1880. (P. E. Martin, Great Hampshire Bee Farm, King's Somborne, Stockbridge, Hants. Price 6d.)

WE believe this almanac has now been appearing for some years. It contains prognostications of weather expected, founded, we presume, on the author's nautical experiences. There are concise and plain instructions for bee management, telling the beekeeper what to do and when to do it. The almanac is interleaved with memoranda pages to be used as a register for the apiarian who looks carefully after his bees and wishes to record his experiences as he goes along. This is, we think, the only almanac issued for beekeepers.

‡ See Virg. Georg., Book iv., v. 210.

THE GARDEN.

By W. EARLEY.

THE frost and snow immediately passed will have entirely severed all connection between autumn and winter, even in regard to the many deciduous native and other trees which have during this most memorable season retained their leaves in a complete and green form until its actual advent. There can, therefore, be no more dallying with the season. All must face the winter in its truest aspects if they are to save their plants throughout its fluctuating inclemency. Already we have information that many good collections of chrysanthemums, upon which a season's labour and anxiety had been expended, had been left unprotected, and their whole promise of bloom display destroyed. And we refer to this matter because many are influenced more by the season as it is, rather than prepare for eventualities of a much harsher kind which might visit us on the morrow. Though we have previously suggested that all such things as are subject to injury by frost, be they flowers, fruit, or vegetables, should be placed into positions of actual safety; yet do we find it necessary to repeat the same. There may be a very severe period to contend with in the immediate future, and it is well, whether such be experienced or not, to be on the safe side; hence, in regard to plant houses, ventilation should be applied most judiciously to all such and other structures—excessive dampness will otherwise cause much injury to all around—it is the one essential antidote to decay in any form. If we maintain an enclosed place, constantly shut up whilst fluctuations are going on without, certain injury is sure to follow, and so great is the influence of this confined dampness that it will readily destroy vegetation, leaf, and branch in any and every form.

FLOWER GARDEN.

Past weather should prove an aid to our past remarks, in view of the need to plant all bulbs. Tulips like a rich bed of soil; crocuses and snowdrops will thrive anywhere, and, more or less, in almost any kind of soil or bed and border. Hyacinths require a warmer and sunnier site, away from boisterous winds, which blow and break them about so when in flower. The first and last may—in view of possible winter frost—be planted about two inches deep; others must not be more than one and a half inches below the surface. All will be greatly benefited by having some cocoanut fibre, or decomposed leaves, tossed broadcast over the surface of the beds.

Those who contemplate having a few moderately early hyacinths, tulips, and similar plants (in flower say early in the month of April), should now examine such bulbs as have been previously potted and placed under cinder ashes or some such similar materials, and select therefrom those which have made the most prominent growth. To bloom them well thus early even, it will be necessary, however, to have some method beyond what a cool greenhouse affords, and this is a very difficult matter with many who only possess one house, and the only practical way out of the difficulty is to do as I have so frequently urged, viz.: build a small enclosed frame within the greenhouse itself, and as near to the heating apparatus as possible. Herein by retaining somewhat an excess of the heat within this frame, many plants may be brought on much more quickly than when they have to stand in the cooler and more exposed place.

Proceed with any kind of alterations during all fine mild periods, whether it be transplanting trees or shrubs, the formation of new walks, lawns, or beds, and the altering of old ones. Look round your gardens to see what tender plants may be benefited by the application of a few ashes or fibre around their base for better protection, whether young pampas-grasses, tritomas of the more tender or summer-blooming kind, fuchsias, hydrangeas, myrtles, or the many kinds of semi-hardy plants which many, from time to time, try planted out in open borders.

Even tea-scented roses against walls, magnolias, passion-flowers, &c., may all be benefitted by a little covering. We had prior to the past winter, owing to a long legacy of mild weather, accustomed ourselves to see things do well without any kind of protection. The last winter, however, which even destroyed many large specimen pampas-grasses, unfortunately showed that trust should not be put in any abnormal weather periods, and we cannot foretell events—hence, it is well to be prepared for what weather the present winter may really have in store.

During mild periods also renew box-edgings, fork over herbaceous borders, dividing such herbaceous plants as need such aid. Chop the roots away from round such stools as require reducing. Take up wholly and replant such subjects as require fresh soil, or a renewed growth, apart from their present bases, for many gross-feeding, robust-growing plants so extend and ramify as to fill the soil with such a network of roots as to preclude their making a rapid and good growth another season. Replant strong-growing plants somewhat low, and tender plants of alpine origin somewhat higher or upon soil more mound shaped, giving beside to rock plants a boulder or two over which to ramble.

WINDOW GARDENING.

Some difficulty will, no doubt, have been experienced during the past severe frost in keeping window plants entirely free from injury thereby. Indeed, in some parts of the country the frost seems to have penetrated to the extremity of all rooms. Oft-times plants may have their leaves frozen somewhat without the main stem or other parts having received particular injury. Hence, by the removal of such parts as are seen to be affected, and keeping the plants themselves somewhat dry, they are often saved for spring and summer blooming notwithstanding. Window grown fuchsias, however fresh and well they may have kept, will probably now lose the chief part of their leaves; it will be well, therefore, to remove them and place them in a cellar, or other not excessively dry place away from too severe frosts. Take care to keep all kinds of cactuses dry at the root, &c., at this time, as this will not only cause them to ripen such growth as they have made, but it will also, in the case of large blooming plants, no doubt, conduce to their giving a better display of blooms later on during the summer months. Remove Begonia Weltoniensis, placing them upon any dry shelf free from frost. Also all other tuberous begonias, which are dying down, may be placed under any kind of protection within the structure, covering them over, where practicable, with a little fibre, beneath the stage, or in any other way which suggests itself.

KITCHEN GARDEN.

Jerusalem artichokes, where they are grown, should now all be taken up and stored away for use and as seed for planting purposes. When it is considered how very irregular is the potato supply, it would be well for all who possess a vegetable garden to try a few tubers of this esculent to assure themselves whether they are really agreeable to their palate or not. Many people are very partial to them, though an equal number object to them. We maintain, however, that, like all vegetable products, they are capable of becoming more liked, and that a taste for them is acquired as it has been in regard to so many other comestibles. Be this as it may, when it is considered how very easily this artichoke is grown and how certain the crop, it were well for all interested to make its acquaintance, that they may determine its merits on their own behalf.

Look now carefully through all stores of vegetable roots, especially of potatoes, should the frost really leave us for a period, and an opportunity be given so to do. We fear that in many instances the severe frost which we have experienced will have penetrated to them. If so, they will, so soon as the real thaw sets in, have to be picked over carefully to remove those which are most injured, &c. Oft-times such tubers will become slightly frosted without entailing their absolute destruction. They invariably become sweeter in taste, however, under such circumstances, and less floury or meritorious. And, considering the quantities in transit between Germany and our own markets, during the past severe weather—many cargoes of which were dock-bound—we should not be at all surprised that many have received a certain amount of injury in these regards.

In a similar manner, many green crops, such as savoys, cabbages, broccoli, &c., will now need looking through for the removal for "use," &c., of all such as are injured. They will all, when injured to any great degree, quickly rot away if this be not done. Besides, they taint the air in a very disagreeable manner when permitted to remain around the dwelling.

Onions, which are not always classed with such tubers as we have before referred to, should have every attention that such limited stocks as growers possess may be made the most of, and retained in good order to the longest time possible. This crop is an extremely scarce one at this time; indeed, they already fetch as much as £15 or £16 per ton in the market, which, when compared with £4 to £6, is an extremely high price.

Occasionally a fine drying period is experienced even amidst winter weather, though we see no likelihood of it at all at this time. Should such ensue, however, and the ground is dry enough to work, it will do all spring crops, autumn planted or sown, a great deal of good to neatly hoe the ground and stir the soil

around or amongst them. Especially beneficial will this be following the snow so recently experienced, which has a great tendency to press tender vegetation down unduly and to lie the ground too firmly. At no season is it so needful to maintain a "home" vegetable garden neat and cleanly as at this time. A knowledge that such a fact exists without is an inducement for more and frequent visits thereto, and anything which induces the family to "turn out" for a short time daily is of vast advantage from a health-securing point of view.

Rhubarb and Seakale may both be brought on much more quickly following a frost, if properly covered, &c., than at any other time. It is customary, firstly, to place pots over the crowns, and cover them over slightly with litter immediately the frost is "out of the ground." Meantime, fermenting materials are prepared, of which a large cartload of such, at least, will be requisite, to ensure the proper maintenance of a requisite degree of heat.

Violets in Winter.

Violets do not like forcing, neither do they need it if their crowns are ripened early, and gently tempted by the protection of glass to open out genially and exhibit their fragrant blossoms. Violets look best and are handiest in small pots; 5-in., or at the most 6-in., pots are large enough for the finest plants; 6-in. pots and sandy loam are the pots and the soil for violets; and, supposing the plants to have been grown in rich earth in an open place in the garden, lift them with balls large enough to fill the pots. In such small pots there is little room for drainage; one small piece of crock over the hole, or a small handful of burnt turf or cocoa-nut fibre refuse will suffice. Pot the plants firmly; the violet thrives best in a hard bed. Water to settle the roots and refresh the leaves, and give no more till the plants are dry. With such scant drainage but little water will be needed till the roots possess and fill the pots with a matted network. Unless during frosts or very cold weather, keep the plants as cool and hardy as possible. The mere shelter of glass will soon awaken growth, and bring forth the blossoms from the fat crowns. The plants may be potted up in batches as they are wanted; or, better still, pot all that are needed now, and store the pots in cold pits; introduce them into the conservatory or sitting-room as they are required.

The frame culture of violets is just the same, only the pots are dispensed with. In the one case the plants can be brought into the sitting or drawing-rooms for ladies to gather their own violets, or enjoy them ungathered; in the other they must go to the frames to gather them, or have them brought in. Perhaps more flowers can be gathered from frames or pits of violets with less labour than from the same number of plants in pots. Any rough stuff will do for the basis of the frame. Place the plants in a light sandy loam; they may be placed pretty closely together, as they do not occupy the frames permanently. On warm days remove the lights wholly; give air more or less at all times when the thermometer is above freezing point; let them be planted on a bank sloping sharply to the south. Thus they will meet every ray of the winter sun. Beware of damp; little or no water will be needed probably after the first settling of the earth around the plants. A good plan of growing violets under frames is to grow them at first pretty close together in frame spaces; then no transplanting is needed. Towards the end of September merely place the frames over the plants, and they soon begin to flower. The art of growing early violets in the open border is identically the same in all the preliminary stages as their culture in pots or frames. Only choose warm places, at the foot of south walls, or in warm, sheltered nooks with a sunny outlook anywhere, and fill these with young plants with fat crowns. The sun and the weather will do the rest; and often they do their work better than we do, with all our glass houses, frames, &c. The secret of plenty of flowers in either house, frame, or the open ground is to grow young plants every year with plump crowns. As to sorts, I still love the old ones best; the Neapolitan, the double Russian, and the single Russian. Add, at least, one modern one, the Czar, for his long stalk, which saves the trouble of mounting for bouquets. F.

POULTRY.

NOTES.

Except in the laying pens, there is little activity in the poultry yard. An early breeding pen or two may be put together. Choose your birds according to your requirements. "If for ye Table Fowle, Let your Cocks or Cockyerell be whyte-legged, and of weight and active, with hys breast bone straight and long, and ye pulletes likewyse, of a productive strayne, large and of full body. If for Eggs, Let your pulletes be of a precocious strayne, fair in syze, who have begun to laye well, and your cocke of a good form, *whose mothyre was likewyse a good layere.*" After the newly made pens have been together a week or two, eggs may be set from them.

Note, where pens are now in full lay—as by proper management they should be—that fresh eggs fetch a good price in all large towns; and it pays better to send them there in most cases than to stand the half-dozen petty profits which lie between the producer, the higgler, &c., and the consumer.

A hen or two may now be set if there is accommodation for young chicks, such as an empty barn or conservatory.

POINTS.

According to the promise made in our last number, we commence descriptions of the various kinds of show fowl, taking them in alphabetical order. These descriptions will be continued in our future issues.

I.—Andalusians.

The origin of the Andalusian fowl is doubtful, but it is most probable that it was first imported from Spain. Mr. Leworthy, speaking of this breed, says that he has possessed birds of this variety since January, 1856. He obtained his own first stock from the late Mr. Coles, of Fareham, who purchased them from Mr. Richardson, an importer of foreign cage and other birds, at Portsmouth, who received them in the first place from a Spanish trader, who landed at Portsmouth in 1851.

They decidedly resemble the Spanish fowl in many points, more especially in weight and size; the cocks weigh from six to seven pounds, the hens from five to six pounds. They are excellent table fowls, and are prolific layers, being one of the most productive of fowls. They are hardy, moderate eaters, precocious, and feather fast and kindly. They can lay when little more than five months old, and are good for the winter. They are not sitters. Pullets hatched in April commence laying in October and continue through the winter. The eggs are of a very delicate flavour.

The general colour of the plumage varies from dark slate, laced round the edges with black, to a dove colour, the hens being generally bluish grey, legs and feet blue without feathers. Mr. J. Taylor says:—"The following are some of the points to which I attach most importance—comb, large, erect, and evenly serrated; cheek, white; plumage, bluish-grey or slate colour, each feather being lightly margined with a darker tint; hackles, glossy, velvety, black, falling evenly on each side of the breast, in strong contrast to the colour of the latter; tail full, carried very upright, with the sickle-feathers well arched. The hens have the same colours, but their combs are pendant."

Mr. Leworthy says:—"The comb of the cock resembles that of the undubbed game fowl, but is rather longer; the hen's comb lies over one side of the face, as in the Spanish, though many hens even yet are bred with comb erect, as in the original birds. The wattles are in proportion to the comb. The face is red, but ear-lobes pure white, and showing up very distinctly from the face, very much as in the Minorcas. The head should be taper, with as little red skin as possible over the eye. The cock's neck is long, and hackle rather short; the breast full and round; tail large and carried very high. The legs are long."

Feeding.—Corn in variety, night and morning: soft food in the middle of the day; meat once a week, with all the green food that can be procured from a large garden. The runs may be con-confined.

II.—Anconas.

The Ancona is another variety of the Spanish tribe. They are very scarce. It possesses a mottled or splashed plumage, the colours of which are very uncertain; they are usually black and white. The face is red; the combe large upright in the cock, and falling over in the hen; the wattles and ear-lobes large. They are not a variety to obtain admiration for beauty. They are supposed to be hardy and good layers.

III.—Bakies or Dumpies.

This breed has been long known in Scotland, but seems to be dying out. The bones of the leg are extremely short (hence their name of Dumpies), the shank-bone being seldom longer than two inches. The average weight of the cock is six to seven pounds, of the hen five to six pounds. They have a fine single upright comb, a rather large tail with good sickles. The colour is light grey or speckled brown. They are hardy, profitable, very good for the table, good layers and sitters, and attentive mothers. Their eggs are large.

They are also known as Go-laighs, Creepers (in America), Courtes-pattes (in France), &c.

Mr. Hewitt says of this variety:—"It is well known that most of our large breeds have a tendency to become leggy. In the Dumpies we at once obtain the best possible cross that could be desired for correcting this evil, as the shank-bone of well-bred birds barely exceeds a couple of inches in length. Dumpies carry much meat in proportion to their apparent size, the flesh on their wings, breasts, and merrythoughts being largely developed. Their superior qualifications for the spit have urged a few amateurs to commence a series of crossings for the purpose of improving our table fowls, and the products of two such experiments I will describe. A Buff Cochin hen running with a Dumpie cock produced chickens that proved very weighty birds, but which were not by any means distinguished for their beauty; their chief recommendation consisted entirely in the two-fold excellency of their being inexhaustible layers, and as almost interminable sitters. They were very careful mothers of their chickens, and tended them much longer than thoroughbred Cochins would have done. This cross exhibited a coarse, unseemly head, with a large, flagging, heavily-serrated comb, and very long loose wattles. In colour they were mostly grizzled, with white about the wings, the ground being rich buff; they proved invariably silver-hackled; the body, too, had a somewhat freckled appearance, and they were not long legged; the colour of the legs was white. It was, therefore, next to impossible to detect their actual lineage by the eye, more particularly as they stood somewhat higher on the legs than the old Cochin mother. In the other case the Dumpie was crossed with a very superior darkly-feathered robin redbreasted grey Dorking hen. This cross was exceedingly satisfactory; the chickens were very neat, cleanly-looking birds, no way reduced in actual size from that of their Dorking parent, but rendered much lower on the leg; from their extraordinary dumpiness they did not look as heavy as they really were, but an appeal to the scales told immensely to their advantage. Many possessed the additional Dorking toe, and showed a very close approach to the most usual form of this variety, but they lacked apparent size; it was on handling that their great weight became evident. Their plumage was irregularly speckled, and even the second cross with the Dorking did not materially diminish this eyesore. They did not lay anything like so well, nor did they prove of the strong rude health that celebrated the half-bred Cochins. They laid but very little better than Dorkings. Divested of their feathers they were specimens worthy of any board, and this characteristic constituted their great advantage."

SWARM OF BEES ON BOARD SHIP.

Commander J. T. Lewis, R.N.R., s.s. Rajpootana, writes to *Land and Water* as follows:—"The following particulars relating to the conduct of a swarm of bees may be interesting to your readers, as illustrating the peculiar instinct of these insects:—

"On Monday, June 23, while at anchor in the harbour of Penang, lat. 5.25 N. long., 190.21 E., at noon, a swarm of bees flew on board in such numbers as to drive everybody off the decks, several of the officers and lascars being severely stung. However, in the course of half an hour the insects settled down on the foretrysail gaff, the mass being about the dimensions of an ordinary beer barrel. We sailed at four p.m. The bees showed no inclination of quitting their quarters, but during the night, the wind being favourable, the trysail was set, when the whole mass fell on the main-deck awning, remaining there till our arrival at Moulmein, lat. 16.30 N., long. 97.25 E., June 27, when the awning being furled they were disturbed, and left the ship, after a few circles round, and made for shore. We saw no more of them till our return on a subsequent voyage, August 25, when, being anchored near the same place at Moulmein, the swarm (evidently the same) took possession of the decks, but, being prevented from settling down on the awning, the bees took up their quarters on the foreyard, forming a bunch equally as large as before. We remained in port ten days, and then sailed *viâ* Rangoon for Calcutta; still the insects kept their post, though, being the height of the S.W. monsoon, with heavy gales, doubtless many were destroyed. It was most interesting to watch their movements, dodging the rain and wind by shifting to leeward of the spar, and sometimes hanging in a pendulous mass some feet below. During our stay of fourteen days at Calcutta their appearance and movements were the cause of much curiosity and speculation on the part of the natives, as they had begun a comb. We sailed on September 20 again for the Straits of Malacca, a voyage of about 1,500 miles, our singular passengers remaining by us, though we touched at Rangoon, Moulmein, Penang, and Singapore; but on our return to Penang, on Oct. 11, the whole swarm took their departure for shore, this being the port at which they originally embarked. A small quantity of fine white wax was taken from their late location. The constant disturbance must have prevented the accumulation of their sweeter treasure.

THE "FARM JOURNAL."

The Farm Journal (54, Paternoster-row) has for some time past opened its columns to the important subject of beekeeping. We wish all other agricultural journals would do the same, for beekeeping needs much extension, and should be an item in the work of every farm in England. We have been accused, if not of a wish, of a likelihood of splitting the beekeeping world of England into rival factions. We repudiate any such desire, and cannot see the likelihood of our causing any such catastrophe. So improbable does so unhoped-for a disaster appear to us as likely to be caused by the publication of the Beekeeper, that we are only too glad when we find any other independent paper using its power to advance and increase agriculture.

"A Lanarkshire Beekeeper" occupies the pages of the *Farm Journal* (16th November) devoted to bees. He records the serious illness of a child, about eighteen months old, who partook of adulterated honey (glucose).

Speaking of agricultural knowledge, and who is entitled to pre-eminence, he says:—"It is claimed by several nations and by every journalist (he ought to except the Editor of the Beekeeper) as well as by many eminent writers down to the novice of but a few years experience.

"The best way to dispose of the question is to allow the ignorance which is bliss to remain so; while those with knowledge, which is the way to perfection, go on rejoicing. I remember, when a little boy, many years ago, a piece of paper came into my hands containing something about Neighbour's hives. Such a name was then foreign to me, so I concluded that it must have reference to the parable of the Good Samaritan, as mentioned in St. Luke. Time wore on apace, until I actually became acquainted with the Neighbour, and found him, as well as many others did, to be a neighbour indeed. And it is Mr. Neighbour (author of the 'Apiary'), of the firm of George Neighbour & Sons, 149, Regent-street, London, who deserves the palm of honour as having done most for Great Britain in the management of bees. To him we are indebted for the introduction of the wax sheets, or what is now termed comb foundation, for the manufacture of plates and machines for embossing these, and from whom the beekeepers in the West of Scotland obtained the plates about twenty years ago; who, during that time, was at a wonderful height in bee management and enlightenment, while almost all the rest of the bee world was fast asleep, now awakened up from their 'Rip Van Winkleism' to claim the honours of those gone twenty years before. To the same firm of Messrs. Neighbour are we indebted for the introduction of the Ligurian, Smyrnian, Cyrian, and Carniolan bees into Great Britain. Nor is this all. I have before me a description of different hives thirty years ago,

among which are Neighbours, possessing then features which are now claimed by modern manufacturers. To A. Neighbour we are indebted for the translations from the German of much importance, not the least being that of foul brood, which is the bee plague, invariably making its appearance after an overheat or a stifling; also traced in being introduced from infected hives standing within flight of the robber bees.

"The Germans, however, not denying the disease to exist in honey, maintain (what seems to me reasonable) that pollen is the origin of the disease. From their researches and microscopical examinations bacteria was always found in the pollen of the diseased hive. These revelations point to another source whence the disease is likely to spring—viz., where proteinous matter is abundant (near where bees are gathering pollen) and is in a feculent state, the germs may be readily transmitted, either by natural selection to fresh nitrogen found in the flowers, or by the currents of air. I have seen the bees gathering the pollen of anemphilous plants from the ground where it had been wafted by the wind, and close to these feculent pools; and from my experience of the extraordinary prolificness of these indestructible germs, I have no doubt that this may be the origin of foul brood.

"The rapidity with which it spreads will be better understood if I explain one or two of my experiments. Nearly twenty years ago I proved that milk was not only a propagator, but a real transmittor, of disease—perhaps was the first to experiment in that direction—and have ever since made some interesting ones, both with the foul brood and direct from the fever patient. The milk, in these cases, 24 hours after, was in active fermentation, and in four days putrid. Under a powerful microscope, a drop lifted by the point of a needle showed thousands of bacteria, and many animalculæ, illustrating beautifully how foul brood acted on the larvæ of the bee, and how enteric fever acted upon the human system. Moreover, I have in my study a dried sample of infected milk, two years old, with which I can reproduce the disease at will, although in some cases it remains latent for a longer period, but in every case proves the danger of trifling with the indestructible and subtle fungi preying alike on animal and vegetable life—still under the control of man, if means be adopted, the possibility of which may be understood by the following experiment last summer: From a strong hive I extracted a brood comb, to strengthen a weak one; in this comb I observed one diseased cell; in six weeks the combs were completely rotten. From the strong hive first mentioned I extracted three combs of sealed honey of the year previous, giving wax sheets in their place; and at present it is one of the strongest hives (headed by a Carniolian queen) in my apiary, and free from disease, showing plainly that the disease existed in the extracted combs. The perforations in the seals of the cells of foul brood hives are simply incompleted seals, the larvæ having died before that was accomplished."

HOW LONG DO BEES LIVE?

WORKING bees are meant for queens, and drones are different creatures, and both are treated differently in their cells, and in life, and at death. Working bees live nine months. Bees born in August and fairly treated live till May. Of this fact we have had ample evidence in hives that bred no bees between these months, and in hives that had drone breeding queens. Given a good hatch of brood in a good hive in the month of August or September it were easy to tell how long that hive would live if no more brood were hatched in it. It would gradually dwindle and become weaker in numbers till the last hatch of brood reached the allotted span of life—viz., nine months, and then "go out." During the last few years statements have been made by various writers and teachers touching the length of the life of bees, which are misleading. Many statements could be quoted; let one suffice. "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." This quotation is made from a recent lecture pretty full of good common sense and practical teaching. If working bees live no longer than five months it would be a difficult matter for British and American bee masters to keep their stocks alive during the shortest of winters. For the comfort and encouragement of all it should be well known that working bees live nine months.

During the spring of the present year, in April, I found that one of my best hives had a drone-breeding queen all winter, and guessing that the youngest working bees in it were about eight months old I gave it a fertile queen and fed it well. The result was that three patches of brood (working bees) were hatched before the old bees died. Thus the hive was saved and did as well as the rest of my hives. It is well known that the loss of bee life in summer is very great, but who can tell whether the loss is caused by natural death or by accident? If men or bees expose themselves to risk of life and are cut down it cannot truly be said that they reached the span of life and died natural deaths. The instincts of bees, their care for their young and their industrial habits, prompt them to leave home often during unsettled weather. On their way to and from distant pasturage they are often caught and destroyed by storms. They perish on the altar of their own industry by thousands and hundreds of thousands. But is this natural death? On high authority it is said that some "men shall not live out half their days," and it may be safely asserted that many and most bees are lost before they have spent half their days. In good seasons and in favourable weather the effective forces of hives are not lost rapidly—nay, rather they multiply rapidly and swarm frequently. Some seasons hives are brought home from the moors having lost eight-tenths of their bees in three weeks, and some seasons hives are brought home well filled with bees. We have known 8 and 10 lbs of bees taken from hives after seasons of hard work on the moors, and in other years we have known hives of equal size and strength return with less than 2 lbs of bees in each hive. In one season the bees were killed or lost by weather or accident; in the other they were not so destroyed.

Are the bees whose lives are cut short in summer killed by hard work or by accident? This is the question—the point of consideration which we wish to leave open for the opinion of others. If asked for my own opinion I would say, "death by misadventure." Of all bees queens are the hardest workers and do the hardest work, but they are never exposed to the hardships of out-door labour or the accidents of weather. Queens come to their end by natural decay, generally speaking, at the age of four years. Working bees, let me say once more, come to their end and die natural deaths at the age of nine months or thereabouts. Drones are not allowed to live out half their days. Some are killed in infancy, and some are permitted to arrive at manhood before they meet their fate.—A. PETTIGREW, in *Journal of Horticulture*.

A few of the published opinions of other apiarian authorities on this point may not be out of place.

Dr. Bevan thinks that all the bees brought into existence at the queen's great laying in spring die before winter.

John Keys says:—"Bees, considered individually, live about a year, progressively coming into birth, and as gradually decaying. It hence follows that those born in autumn or spring, or in the intervening months, inevitably die about the same time in the succeeding periods of time, and so in a regular proportion during the breeding season; but this is not perceived while the brood is rapidly increasing, and counterbalancing the chasms made by death."

Dzierzon believes that the duration of life of the worker depends greatly upon the nature of the labour on which it is mostly engaged, but if it passes a summer in repose, and is well fed, it may live for a year or even more.

Mr. Hunter ("Manual of Beekeeping") remarks:—"The length of life of the worker bee is determined by the amount of work it does, and the introduction of a fertile Ligurian queen at various seasons enables us to determine this question with almost certainty. After the introduction of a fertile Ligurian queen to a colony of black workers in May, if we

examine the hives two months subsequently, we shall find very few black bees remain, they having died and been replaced with Ligurians; and as probably at the time the strange queen commenced her reign some eggs or larvæ of her predecessor remained, we may conclude that six weeks is the limit of time a worker bee will live in summer. Should the new queen be introduced in October, not until April following will the same state of affairs be found; it is thus evident that the quietude and rest of winter prolongs the bee's life fourfold."

Von Berlepsch made three experiments of this kind, and found that in one case (the Ligurian queen being introduced in October) some of the bees lived eight months. By the second experiment he found that some lived ten and a half months. The third experiment, introducing a Ligurian queen in the summer, showed him that at that season of the year the average life of the worker was but six weeks.

Professor Cook ("Manual of the Apiary") writes:—"The worker bees never attain a great age. Those reared in autumn may live for eight or nine months, and if in queenless stocks, where little labour is performed, even longer; while those reared in spring will wear out in three, and when most busy will die in from thirty to forty-five days. None of these bees survive the year through, so there is a limit to the number which may exist in a colony. As a good queen will lay, when in her best estate, three thousand eggs daily, and as the workers hive from one to three months, it might seem that four thousand was too small a figure for the number of workers. Without doubt a greater number is possible. That it is rare is not surprising when we remember the numerous accidents and vicissitudes that must ever attend the individuals of these populous communities."

THE AUSTRO-GERMAN CONVENTION.

More than 700 beekeepers assembled at the Hall at Prague, on Tuesday, September 9th, 1879, at the opening of the 24th annual Convocation of the Austro-German Association. From all the provinces of Germany and Austria, from France, Italy, Russia, and America came the representatives of rational apiculture, to compare notes as to what had been attained during the past ten years, and to discuss the most important points in this very interesting branch of husbandry.

Herr Ritter Von Comers, the President, opened the session by a nice speech, welcoming the visitors to the Convention, and the Mayor of Prague gave a hearty welcome to the Association.

Before proceeding with the discussions, the Russian Councillor of State, Herr Prof. Dr. Butlerow, was entrusted with the mission of presenting in person to Dr. Dzierzon the Order of St. Anna from the Emperor of Russia, for his efforts for the elevation of apiculture. Dr. Butlerow said it gave him great pleasure to present this mark of high esteem to Dr. Dzierzon, and then placed the badge upon the Doctor's coat. Dr. Dzierzon was much affected by the transaction, and said that he regretted that the programme was interrupted by an act of such a personal nature, but still he was glad to see that so high a personage had so acknowledged his modest efforts on behalf of rational apiculture.

Herr Werner then stated that the Emperor of Germany had recently conferred upon Mr. Hilbert, of Maciejewo, the Order of Crown for his remedy for foul brood.

After reading the minutes of the last meeting the discussions commenced by the following:—

How to Increase the Agreeableness of the Management of Bees.—Dr. Dzierzon introduced the subject by stating that the first point was the meekness of the bee itself. He preferred the Italian, Caucasian, and Krainer bees, who were not so much disposed to sting as the native bees. The hives should be in such a condition as to make them feel at home and to prevent their being irritated. He approved of many of the new inventions for the management of the bees as means to this end.

Herr Hilbert said that the family arrangements of the hive were such as to induce happiness and contentment among its inmates.

Prof. Sartori, of Milan, Italy, said that he had lately made journeys through Russia, France, and Germany, and everywhere found a desire for rational bee-culture. He had pleasure in presenting some Russian queen bees to the society.

Herr John Schmidt, of Moravia, said that he preferred bees that would sting; that proved that they were healthy. He preferred the Cyprian bees, but each race is good if well treated.

The President remarked that the widow of the late Baron of Berlepsch and her daughter were present, and introduced them to the assembly with appropriate remarks.

The American representative was formally presented to the Congress, the President remarking that he regarded it as a great honour for the Association to receive a representative from America, a country that is known to be progressive as well as very practical in the science of apiculture. He had great pleasure, therefore, in welcoming to a seat in that body Mr. T. G. Newman, who was not only the representative of the "North American Beekeepers' Association," but also the President of that honourable and much-respected body. This was followed by much cheering, and then we were called upon for a speech. We remarked that America desired to exhibit the good feeling which she had towards all the kindred societies of the world, and had sent her representative to personally express that feeling, not only to the societies of Great Britain, but also to those on the European Continent, but more especially to the Austro-German Congress, whose members comprised so many of the famous names of excellent apiarists that are revered the world over. We came to see and talk with them—to listen and to learn, as well as to tell them how Americans were progressing in the science of apiculture. We wished them all a prosperous and interesting session. Our remarks were interpreted and repeated by the honourable Baroness of Berlepsch, and were received with many cheers.

Upon the question as to whether it would do to cross the Italian bee with apis dorsata, Dr. Dzierzon stated that he did not believe it would be advantageous.

Herr Stahala, Councillor of the Consistory in Moravia, spoke concerning the safest method of introducing queens, and advised the transferring of the bees as well as the queen into a new hive. Finding themselves in new quarters they will the more readily accept the new queen without trouble.

Herr Lehzen, of Hanover, Prof. Sartori and Paster Puchar thought it quite unnecessary to so disturb the colony.

Herr Vogel advocated the introduction of the Caucasian bee. They are more easily controlled, and are the most docile of all the races of bees, the queen being exceedingly prolific. One thing he was able to state, and that was the honey gathering qualities of the bees.

Prof. Dr. Butlerow, of Russia, also endorsed the statement concerning the qualities of the Caucasian bees.

Herr Frei, of Nuremburg, gave his method of queen rearing.

Herr Reinert, of Starkov, wished to know why in parts of the country where foul brood occurs that it suddenly appears, and how can it be prevented?

Herr Hilbert gave his experience with it, and explained his treatment of the disease and methods for preventing it.

After the banquet and the distribution of the prizes the Convocation adjourned, to meet at Cologne next year.

DORSETSHIRE.

On the evening of Tuesday, November 18, Mr. C. Tite, of Yeovil, delivered a lecture in the reading-room of the Shaftesbury Literary Institution on "Bees and Beekeeping." The lecturer traced the progress of beekeeping from the most ancient times to the present day, and showed the great superiority of the present bar frame over the old skep and the abominable smotheration system. The lecture was illustrated by diagrams, hives, and other apiarian appliances, and the large audience appeared to be thoroughly interested by the lecturer's remarks, a number of persons coming forward at the close to learn still further of the advantages of the bar frame, extractor, sectional super, &c. Several ladies and gentlemen kindly gave their assistance to make the evening still more enjoyable by singing several appropriate songs and duets.

BRITISH BEEKEEPERS' ASSOCIATION.

The monthly meeting of this Association was held at the Board-room of the Royal Society for the Prevention of Cruelty to Animals, 105, Jermyn-street, on Wednesday, December 10th. Present:—Mr. T. W. Cowan (in the chair), Mr. J. M. Hooker, the Rev. E. Bartrum, and W. O. B. Glennie, treasurer.

The Chairman announced that he had received a letter from the Rev. G. Raynor, who was unable to be present at the meeting, stating that he would be pleased to read a paper at the next Conversazione, on January 14th, on either of the two following subjects viz.:—"The Ligurian Queen Bee: her introduction to alien stocks, and the best means of pure propagation;" or, "The Hive."

It was resolved, "That the Chairman should write to Mr. Raynor to the effect that the committee gladly accept his offer to read a paper at the next Conversazione, and that the selection of the subject for discussion be left to Mr. Raynor himself."

The Rev. E. Bartrum reported that he had been in communication with Mr. Buckmaster, of the Science and Art Department at South Kensington, respecting the Professorship of Apiculture, and that he was prepared to submit a resolution upon the subject at the general meeting in February next.

It was unanimously resolved that Mr. W. A. Kirchner should audit the accounts and the balance-sheet for the past year to be placed before the committee at their next meeting previous to publication.

LONDON HONEY MARKET.

The following are the quotations for the past month:—

			1879.	1878.
Oct. 18	Cuba	per cwt.	25s. to 38s.	38s. to 50s.
„ „	Jamaica	„	27s. to 40s.	35s. to 45s.
„ 25	Cuba	„	25s. to 40s.	38s. to 50s.
„ „	Jamaica	„	32s. to 40s.	35s. to 45s.
Nov. 1	Cuba	„	25s. to 40s.	38s. to 48s.
„ „	Jamaica	„	30s. to 38s.	35s. to 42s.
„ 8	Cuba	„	25s. to 38s.	36s. to 48s.
„ „	Jamaica	„	27s. to 40s.	35s. to 45s.

There have been but small sales, most lots being bought in. Consignments of Canadian Bass-wood honey have been sent to Liverpool, where they fetched 5d. to 6d. a pound, and to Southampton direct to consumer.

An Error in No. 1.—Mr. Desborough called our attention (see page 46) to an error in our first number (page 24) where we gave John Hall as an authority for a quotation instead of John Keys. We find that Mr. Desborough is right, and Professor Cook (from whose Manual we took the quotation) is wrong. The words occur in the "Antient Bee Master's Farewell." John Hall wrote some studies of nature, in which he gives a very weak conversation of bees. We were thinking at the time of an author called Hall, Hill, Hylle, or Hyll, who published "Profitable Instructions for the Perfect Ordering of Bees" in 1579.

Prof. Sartori, of Milan, Italy, has lately been to Russia, in the interest of bee-culture, and has met with great success—the Emperor being much interested in the subject. Prof. Dr. Butlerow, Councillor of the Government, was the bearer to Prague, from St. Petersburg, of the Imperial distinction of the Order of Saint Anna, for his friend Dr. Dzierzon. This was presented to him with the usual ceremonies on Tuesday, Sept. 9th, at the Austro-German Congress at Prague. This honour, from such a source, is much appreciated by Dr. Dzierson.

Since the spring of 1876 Herr Benedict Broglio, of Strausburg, has been practising the following method with success in introducing queens:—The bees of the hive into which the queen is to be introduced are brushed from the combs into a box, then dampened with fresh water, and poured down before their hive; the queen being permitted to crawl into the hive with the buzzing bees. Before beginning this operation the queen that is with the colony at the time is removed, or any queen cells present are destroyed, when the bees have been shaken from their combs.

APOLOGY.

The letters we have received complaining of delay in answering inquiries, acknowledging subscriptions, and attending to business generally, have lately been so numerous that we cannot reply to each one separately.

We take this opportunity of making an apology to all who have addressed us, and of informing them that owing to the unsatisfactory state of affairs, brought on by this great dilatoriness, we have taken the business away from our late publisher, and shall, *pro tem.*, carry it on ourselves. "If you want a thing done, do it yourself."—G. Rose.

TO SUBSCRIBERS.

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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 "BEE-KEEPER."

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 "BEE-KEEPER" not later than the first day of the month for whicht hey are intended.

JANUARY AND FEBRUARY.

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

SUBJECT FOR JANUARY.

"How Much do Bees Depend on their Power of Sight?"

SUBJECT FOR FEBRUARY.

"Can Bee-culture be made Profitable? If so, How?"

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