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Notes and Comments

By J. L. BYER

In August 1st "Gleanings" R. F. Holtermann, speaking of queen-clipping, gives the writer of these notes the following "business notice": "Propolize slightly the thumb and finger before beginning work; and if you scrape your hives well when the season opens and propolis is scarce, write to J. L. Byer for some of his surplus." With visions of money rolling in next spring from an unlooked-for source, was in somewhat of a dilemma as to what to charge for my special commodity, unless, as luck would have it, I noticed in the "American Bee Journal" a statement from Mr. F. Greiner in effect that in Germany propolis was worth from 25 to 50 cents per pound. Owing to the high price of honey, I think that my special brand of propolis should be worth at least \$1.00 per pound. To avoid being swamped with orders, I will only sell to Canadian bee-keepers who overhaul brood-nests and clip queens in March, and to show that I appreciate free advertising, I positively refuse to fill any orders until friend Holtermann has received his annual reply.

Prices of Honey.

While to some the prices suggested

by the Ontario Association Committee may seem a little high, when everything is taken into consideration, I believe that all will have to admit that, as compared with other food products, honey at prices suggested is not unreasonable. Apple-packers are offering from 50 per cent to 75 per cent more than last year's prices, and all kind of berries and other fruits are correspondingly higher than they were last season. Personally, would gladly sell much cheaper if the crop would warrant it, as the years I made the most money were when we had large crops and prices were quite low. However, as Mr. Deadman says, regardless of size of future crops, honey should not go as low as in former years, and for some years, at least, it is quite possible that present prices will be maintained. As to this year's crop, in our immediate vicinity the situation is much aggravated by failure of the buckwheat, caused by drouth and cool weather. It looks now as though our feeding for winter will about absorb all the surplus taken from the bees.

Winter Ventilation of Hives.

J. E. Crane, in "Gleanings," has the following re his methods of outdoor wintering: "I have most of my hives fitted with a tin tube, say $\frac{3}{4}$ inch in diameter, 4 inches long, running through the outside case, packing and brood-chamber, five or six inches above the bottom. Then I am not worried about their getting clogged. In very cold weather it fills nearly or quite

full of frost, and thus automatically reduces the size of the entrance to fit the weather. If the lower entrance is entirely closed it does no harm, but may be a decided advantage. Thus fitted, I sometimes do not visit a yard of bees for several months during winter." So good a Canadian bee-keeper as Mr. J. T. Storer of Lindsay has used this device for many years, and is quite positive as to the benefit accruing from its use.

Although he now winters mostly in the cellar, he has the same principle incorporated in his single-walled hives. While in winter quarters the tube is open, and I think this explains his splendid success in wintering, regardless of the fact that he never loosens the bottoms from the hives. In the early spring the openings are closed with corks, and later on, when the hives are populous and the weather hot, these corks are removed, and the openings act as ventilators. From what I have seen of their use I believe they are a splendid device, and if used more would save many colonies each winter.

Good Queens Do Not Always Duplicate Themselves.

"Like begets like" is a quite common and generally true axiom. That there are exceptions to this rule has been amply verified in my one yard this season. Last year three queens that had for three successive years been the best in the apiary were superseded. Naturally I expected great things from their daughters, but in this I have been disappointed, as the daughters' work has hardly come up to the ordinary. No question but that drones from some poor stock are responsible for this deterioration, and I suppose, until the question of controlling the mating of our queens is solved, we

will occasionally have such experiences occur. However, in the majority of cases, I have found that an exceptionally good queen generally duplicates herself in her progeny in the matter of good qualities, and I still think that breeding from such queens is a safe rule to follow.

Introducing Queens.

This is an old subject, and as nearly every bee-keeper has the "best plan," as I have had considerable experience this summer, I will give my methods and tell of the success (and failure) of the same. Owing to quite a heavy loss at two of my yards, coupled with the fact of my being very busy and the almost total absence of swarming, I bought forty queens from two reliable breeders. Twenty of the queens were Carniolan and twenty Italian. A few days before queens came two combs of brood were put above the excluder in forty strong colonies. When queens arrived forty nuclei were formed with these brood combs, and in addition each nucleus was given a comb of honey, and some bees were shaken in the hive, taken from the colony from which the nucleus was formed. The entrance was closed with grass, and the queen was placed on top of the frames in a cage, the attendant workers having first been removed. The twenty Carniolans were all accepted and are at the present in good condition. Three of the Italians disappeared mysteriously, no trace of them being found on board in front of hive. Of the 17 left, although the queens were large and looked perfect in every way for some reason I cannot understand just as soon as they started to lay the bees were determined to supersede them. Seven of the queens were superseded for all I could do, and in all but two or three cases the young

queens mated all right. The all received by were introduced same conditions related details to prove entirely successful at another time, conditions, losses in whole I was well reason was very poor that at time of though clover was the bees would rob whatever. Past experience that robbing conditions to be avoided introducing queens to lose some of them arrived during a time the almost total a

Peculiar Place

Some weeks ago in my apiary where some

Fall

(Paper by Mr. ...)

Fall management of our bees for wintering next season, and in laying the foundation. The work of the fall season is of great importance. About the middle of the season, find out its condition, strength of bees, and as well as to

queens mated and appear to be doing all right. The queens were nearly all received by the same mail, and were introduced under precisely the same conditions, and I have simply related details to show that what will prove entirely successful in one case, at another time, under the same conditions, losses might occur. On the whole I was well satisfied, as the season was very poor—so poor, in fact, that at time of forming nuclei, although clover was in full bloom, yet the bees would rob if given any chance whatever. Past experience has taught me that robbing is one of the worst conditions to be confronted with when introducing queens, and I fully expected to lose some of the queens when they arrived during a time when there was the almost total absence of nectar.

Peculiar Place for Storing.

Some weeks ago I went into a small apiary where some of the colonies had

been wintered in rough boxes, two hives in a case, one hive above the other. One of these said boxes at once attracted my attention by the peculiar action of the bees, which formed a continuous chain between the entrances of the two hives, a space of fully two feet. The owner said the colony in the upper hive was dead, and from the fact that bees were going into this hive carrying pollen, I judged that a swarm had taken possession. On examination we found that the bees from the lower hive were actually using the upper hive for storing in. The old honey had not been carried out, and considerable fresh honey and pollen was in evidence. How would this strain of bees do for section honey? Certainly they would have no objections to entering the supers, no matter what the nature of such.

Mount Joy, Ont.

Fall Management

(Paper by Mr. Denis Nolan, and Discussion at Meeting of O.B.K.A.)

Fall management consists of preparing our bees for winter, for spring, for next season, and in many ways it is laying the foundation for future success. The work of the fall season may be assessed to a great extent by the system of managing during the summer season. About the middle of September make an examination of each colony, find out its condition in regard to strength of bees and quantity of stores, as well as to know it has a

good laying queen and is in a healthy condition.

If sufficient bees to cover five Langstroth frames are found it will be safe to put such colonies into winter quarters; if less than this amount of bees it will be better to unite with another weak one and have a good colony.

To do this remove about half of the lightest combs from the colonies to be united, and some time afterwards, on a cool evening, put two weak ones together by placing the combs of one

with adhering bees alternately between the combs of the other. Remove one queen, if one is inferior to the other, otherwise let the bees settle it amongst themselves. Be careful not to get too strong colonies in this way, as they do not as a rule winter as well as medium ones.

All colonies going into winter quarters should have a laying queen, and colonies that have been queenless a short time may be given a laying queen by some safe plan of introduction.

If the colony has been queenless since the swarming season it will be useless to spend time and feed on them, as the bees are too old, and will die during the winter.

The most important part of this season's work is to provide each colony with sufficient good stores to carry them through until they gather feed next season.

If we could supply them with about 25 pounds of good clover honey, well ripened and capped, there would be little danger of winter losses.

We must have some reliable way of determining the amount of honey each colony contains as found when we are doing this work. Some good bee-keepers weigh their colonies on scales, allowing so much for the hive, combs, etc., but I consider it unreliable, as there may be a difference of ten pounds in the make-up of the different colonies, a difference in the material of the hive, amount of brood, pollen, etc., in the combs.

I consider an examination of the combs the best way to estimate the stores, and if honey is found to the amount of five or six Langstroth frames it will be sufficient. A colony with less than this amount should be given well-capped combs to make up the shortage, removing empty combs and crowding the bees upon as few

combs as the food supply and quantity of bees will allow, putting in division boards or dummies. This keeps the cluster more compact and in a body during cold snaps in winter.

If colonies are short and combs of honey are not at hand, liquid feed may be given, after first contracting the space for storing, as in the other case.

As a rule pure sugar syrup is fed made from best granulated; it may be given in any kind of feeder if fed early in the season.

A handy feeder may be made to go into an extracting super, made one inch smaller than the inside of the super; it may be made of undressed lumber waxed at the corners, and made of different depths to hold just enough for any colony; a few small strips of blocks of wood for floats.

Place the feeder upon the tops of the frames, and if the weather is cool feed the syrup warm. Contract the entrance and feed during the middle of the day.

The syrup, I think, gives best results when made of a consistency of three parts sugar to two of water. Sometimes a little honey is added to prevent granulating, but I never practice using it.

Our syrup is made with steam, and it gives good satisfaction. A half-inch steam-pipe is run down into a barrel or honey-storing tank; put in 2½ pails of sugar and one of water until the tank is nearly full, then turn on the steam, which will then warm the water. Agitate the sugar with a little stirring. The sugar is soon dissolved and the syrup can be drawn off at the bottom.

In conclusion I wish to state that what I have just given you on this subject is solely for the preparation of the bees for outdoor wintering.

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MR. DENIS

Discus

Mr. Beaupre—How would you unite?

Mr. McEvoy—Mr. about feeding the co of September. I thi month too late.

The President—I th Mr. McEvoy—I lik or outside winterin hink we can have to 5 pounds of stores sider that amoun would rather have ounds not enough.

not having any experience in wintering otherwise, and cannot say that this would answer for preparing for indoor wintering.

Newton Robinson, Ont.



MR. DENIS NOLAN.

Discussion.

Mr. Beaupre—How late in the fall would you unite?

Mr. McEvoy—Mr. Nolan speaks about feeding the colony in the middle of September. I think he is about a month too late.

The President—I think so too.

Mr. McEvoy—I like plenty of bees for outside wintering; he seems to think we can have too many. He says 5 pounds of stores are sufficient; I consider that amount rather limited; I would rather have more. I think 25 pounds not enough.

The President—Thirty-five pounds?

Mr. McEvoy—I would rather. As to the feed, Mr. Nolan says 3 parts sugar to 2 water. I prefer the proportions 2 and 1.

Mr. Nolan—I said that a good deal of this work could be done earlier in the season. I did not say we should leave our colonies queenless, but I said if we found in September that they had been queenless a short time we should by some plan of introduction give them a good laying queen.

The President—Do you propose doubling a colony if you found one queenless,

Mr. Nolan—I think if we found one that had lost a queen one could be given them.

Mr. Holtermann—I think Mr. Nolan will require to change his paper a little. A word or two will be sufficient. I noticed the objection Mr. McEvoy raised. The paper gave me the impression that you were to see they had good laying queens; that is too late to know whether they were good laying queens or simply queens.

Mr. Nolan—I did not mean to say that we were looking for a queenless colony at that time.

Mr. Laing—As to Mr. Nolan's way of feeding, to those who have steam-pipes it is all right if they desire to use them. I have used cold water and a stick for years.

Mr. Holtermann—Do you make sugar syrup out of cold water and stick?

Mr. Laing—Yes; sugar maple would do.

Mr. Holmes—This is the first time I ever heard of any one who gave bees anything with "stick" in it.

Mr. Laing—It is a very easy matter to dissolve three pails of sugar in two pails of water.

Mr. Pettit—Before we leave this matter I would ask Mr. Nolan how he knows a hive is queenless in September.

Mr. Nolan—You can tell by the appearance of the combs and by the appearance of the bees in 19 cases out of 20.

Mr. Hershiser—My bees breed a

good deal longer than the middle of September. I find brood until the middle of October. I presume it is owing to the locality; if there was nothing for them to gather they would not be breeding up to that time. It would be unsafe for me to look over the colonies to see how much stores were left until they have left off breeding.

As to the feed, if I find they diminish I feed them well and give them a syrup as thick as they can very well take. The food I give them is 5 pounds sugar to 2 pounds water. You may find that too much sugar, perhaps. I mix it with hot water, too, but, all things considered, it will perhaps be better to make the proportions 5 to 3 instead of 5 to 2.

Now as to the amount of stores, I think a person will need to be pretty accurate and examine each comb separately. I weigh the colonies and know how much a 10-inch frame should weigh. By weighing a colony I can tell how much stores it has, then I go to work and weigh a lot of brood combs that are empty, and I make plenty of allowance for old combs.

Mr. Timbers—Might not a bee-keeper be deceived sometimes? The cells might be half full of pollen. There ought to be some method of ascertaining whether the combs contain more pollen or more honey.

Mr. Holtermann—If a man is going to feed his bees he should examine them first. You are not likely to find combs so pollen-clogged unless the queen has been absent.

Mr. Timbers—I mean in the stores gathered by the bees themselves.

Mr. McEvoy—It does not matter if there is a good deal of pollen. The bees consume the honey up until they strike that pollen. You should feed to cover the pollen; feed plenty.

Mr. Timbers—Will that amount of pollen answer the same purpose during the winter as that amount of honey?

Mr. Hershiser—No.

Mr. McEvoy—No, but if you feed plenty of stores it doesn't matter if there is quite a bit of pollen.

Mr. Holtermann—You are afraid of

giving the bees too little rather than too much?

Mr. Newton—Speaking about lifting and examining the hives to tell what they weigh, I think there would be lots of trouble among our younger beekeepers if this were adopted. The most satisfactory way is to weigh the hive, and then allow so much for the hive. I calculate 23 to 25 pounds for my hives. If mine weigh 52 to 53 pounds I feel satisfied that colony will go through; that is, in the brood-rearing season.

The President—That is good advice. When I first started bee-keeping I could not by feeling the hive tell how much it would weigh, but I got to be a pretty good guesser as to how much a hive would weigh, and for two or three years I have hardly used the scales. Sometimes I test to see if I am correct.

Mr. Hershiser—It depends a good deal on what time of day you weigh. In the evening they are heavy and in the day they are light.

Mr. Roach—Suppose you do away with this weighing and feed them as much as possible, would you have too much?

Mr. McEvoy—Yes.

Mr. Holtermann—With reference to feed, I think two pounds of sugar to one pound of boiling water makes the best food. In the matter of weighing, I agree with the President when you are used to it, but I think if you are not it is better to use the scales.

Mr. Deadman—The strength of the syrup depends on the time of year you feed; if early in the season use more water. I like to feed with warm syrup especially if the weather is cool.

Mr. Whiteside—There seems a difference between feeding and the bees gathering it themselves. In 1889, for instance, at one of my yards they got a surplus of about 1,200 pounds, and I took this surplus and fed the other young bees with it and brought them up to the same standard. About the next June I came round to this same yard again and found it was all right—there was hardly one short of stores in it—but the other yards had about

150 starved to death in 89 colonies in the surplus; the about 50.

Mr. McEvoy—them?

Mr. Whiteside—Mr. McEvoy period?

Mr. hWhiteside—September.

Mr. McEvoy—brood rearing?

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150 starved to death. There were about 89 colonies in the yard where they had the surplus; the other yards averaged about 50.

Mr. McEvoy—When did you feed them?

Mr. Whiteside—When I had time.

Mr. McEvoy—But about what period?

Mr. Whiteside—About the middle of September.

Mr. McEvoy—Then you started brood rearing?

Mr. Whiteside—It is one thing for the colony to have plenty themselves, and another thing to feed. It makes quite a difference. All that summer they were at starving point. When they got the feed they could eat three meals a day.

Mr. Brown—Is it a general thing throughout the whole Association to feed with sugar syrup. Why not feed honey, their natural food? When I find colonies of bees short of stores I take out the empty combs and replace them with honey. I don't care whether it is warm or cold water, it is not good food for bees.

Mr. Couse—Mr. Brown speaks of feeding back honey. I have had dark honey which I intended to sell, and I fed the bees back with it instead. It granulated, and the bees starved with abundance of honey. They were sealed with honey, ordinary honey.

Mr. Brown—Had it been extracted out of the comb?

Mr. Couse—Yes, I am telling you what I did with honey feeding it back, but I find it granulates.

Mr. Grainger—I have practised Mr. Brown's plan, saving the dark honey for the purpose. I have always been successful in putting back those combs. They are sealed and are just the finest feed for a colony that is weak.

Mr. Switzer—I have seen no sign of granulation. I have had my bees three or four winters now, and feed them

back honey, and they have been all right. I wonder at you having this trouble with the granulated honey.

Mr. Couse—How do you weigh your bees?

Mr. Switzer—I form a sort of string balance and the bees never know they are being weighed. There will hardly a bee come out of the hive.

The President—Mr. Switzer feeds his bees with honey that never granulates, and Mr. Couse finds that the honey granulates. How is that?

Mr. Holtermann—There is a great difference in honey, some is more sealed than others. This report is going out to the country, and I for one think that it is well just to say a word of warning in the direction of feeding back honey. I know apiaries that have been so badly diseased by feeding back honey, when unknown to the one who did it, that I think it is advisable, if feeding back is to be done, to feed back with sugar syrup; and while I see the objection of throwing lots of honey on the market, it is sentiment rather than a practical thing. I think it is better to feed back with syrup rather than honey.

Mr. Baillie—One question I would like to ask Mr. Nolan. Referring to feeding back, he said in September. If a person neglected it and left it till a month later, what would be the consequence?

Mr. Nolan—I do not think it would be a very easy matter to get them to take it then, the nights would be too cool. I think when you feed the syrup in the last part of September or early in October the bees ripen it and the combs become white. In regard to feeding combs of honey, I would rather feed good clover honey in combs if I had them, but we get the clover honey in our extracting combs. As far as

feeding back extracted honey is concerned, the bees did not winter very well on it. We had great losses. I think it is necessary sometimes to feed the syrup warm. As regards the weight of the hives, I do not put any particular weight on the hives; it is about as fair to say what a hive in the general terms should weigh as what a good bee-keeper should weigh. There is a great difference in the size of hives, and it would hardly be safe to say what weight you should put on. It might be too high or too low. We should not give the bees too much feed, though many bee-keepers think they will not winter well without much feed.

Mr. Timbers—Can bees ripen syrup or honey if it is too late to cap it over?

Mr. Nolan—I think they would ripen it later than they would cap it. I think perhaps if syrup is well ripened it is as good as if it were capped.

Mr. Grosjean—I had one very light colony. There was not more than three or four pounds of honey in the hive when I took them into the cellar. It was very full of bees, and I did not like to disturb them in the cellar. I could not find any frame but what was covered with bees, so I took them and fed them about 15 pounds of one-third honey, one-third water and one-third sugar. It was buckwheat honey. I made it warm and took it down the cellar and fed them. I looked at them a day or so afterwards and they were quiet. Then I made up my mind that should do them till the spring, but I found I had to give them more later on, and they were the best hive I ever had. I got 40 to 50 pounds more honey from them than from any other hive.

Mr. Laing—Mr. Nolan touched on one point; he said that the colony must not be too strong. A colony in normal condition, one which is generally strong, not too weak, will winter bet-

ter than a really powerful one. I would like to have your opinion on this.

Mr. Nolan—That is in reference to colonies united.

Mr. Roach—Three years ago I had an exceedingly strong colony. I was much disturbed about it. It was wintering outside till about Christmas. I left them alone, and in the spring they were starving. That is an over-strong colony.

Mr. Hershiser—The question has been raised as to ripening stores. I want to know exactly what is meant by the ripening of stores. I understand if stores are ripened they will be capped over. If it is not capped will it not do just as well?

Mr. McEvoy—Not quite.

Mr. Brunne—Speaking of feeding—I never lose any more through feeding in the winter. If I winter in the cellar I can feed the bees at any time with success. I use half water and half best granulated sugar. I find it answers better than honey, and it is also far cheaper, and for that reason I get more money in my pocket. As far as feeding up is concerned, I feed up by the first of October. If you have a house cellar put them in it, but have them lifted a little so that you can get to them more easily. I said half water and half sugar, but I think it better to have it a little strong, so that better proportions are three parts sugar and two water, and you can feed them in the cellar any time at all.

Mr. Evans—There are different cellars. Some will not do to put bees in with uncapped honey, and some will. I like to feed the bees as late as they will take it. If I feed them early and again late in the fall it is all turned into bees and the hives are short again. I use the old Canadian feeder made by Jones, which I think is the best feeder

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made in the world. You can cover it well up and keep all the heat in, and it keeps the bees all right until the spring. I would rather have my bees in the cellar than anywhere else.

Mr. Taylor—A neighbor of mine had 25 colonies two years ago and kept them in his cellar. In one corner of it

there is a spring of water. He had eight-frame hives, and he left them the whole winter without a cover on; that is, he just pulled back the covers they had on, and he gave them granulated sugar syrup, and they went the whole winter with nothing else, and they were the finest bees I ever saw.

The Cause of American Foul Brood.

(By F. G. White, Ph.D., Expert in Bacteriology, Bureau of Entomology, U. S. Department of Agriculture.)

For several reasons much confusion exists as to the present status of our knowledge of bee diseases. It is hoped that this circular will give information which will to some extent clear up the subject of American foul brood from a bacteriological point of view. The symptoms of this disease are given in Circular No. 79 of the Bureau of Entomology, entitled "The Brood Diseases of Bees." American foul brood is the prevalent disease in America, and judging from reports received from Europe and from descriptions in European bee journals and books, it is the prevalent one there. There is another diseased condition, which Cheyne examined, and to which we now refer as European foul brood.

When the author began his work on bee diseases in the summer of 1902 he observed, in combs containing American foul brood, in the dried remains of the dead larvae, known as the scales, a very large number of spores which failed to grow when inoculated into the media ordinarily used in the laboratory. It was clear, then, that these spores

are not *Bacillus alvei*, and that this disease is not the "foul brood" of Cheshire and Cheyne. The following year the study was continued and a medium was devised in which the spores found in this disease will germinate. This medium consists of an agar made by following the directions ordinarily used in the laboratory, with the exception that bee larvae are substituted for meat. By the use of this medium were obtained pure cultures of the microorganism which is found so abundantly, in the form of spores, in the dried scales of American foul brood.

In reporting these findings the author referred to this organism as "*Bacillus X*." Further study was subsequently made, and the species was given the permanent name, *Bacillus larvae*. The description of this species may be found in Technical Series No. 14 of this Bureau. In his publications the author has made no claim that *Bacillus larvae* is the cause of American foul brood, but has made the statement that it is found to be present in all the samples of this disease which have been examined

by him. No inoculation experiments were made, for the reason that sufficient cultures in suitable condition could not be obtained from any medium then known.

Since the media used in former investigations are not suitable for obtaining cultures for purposes of inoculation, in taking up the further study it has been necessary to devise a medium which would be satisfactory in this respect. Such a medium has been discovered, and large amounts of the culture suitable for experimental inoculations have been obtained. This medium is prepared and used as follows: Healthy bee-larvae or young pupae are picked from the comb, crushed, strained through cheese cloth, diluted with 20 to 50 times their volume of water, filtered through ordinary filter paper, and then passed through an earthenware filter (the Berkefeld filter is satisfactory) to remove any bacteria which are present. The sterile filtrate thus obtained may be pipetted into tubes or flasks and stored until needed. When *Bacillus larvae* is to be isolated, a tube of the ordinary agar of the laboratory is liquified and cooled to 45 degrees or 50 degrees C. Then about 2 c.c. of the filtrate mentioned above is added to it. A very small amount of the decaying larvae affected with American foul brood is then added. The procedure from this point is as usual in making agar plate cultures; these plates are afterward incubated. When a large amount of culture is desired for experimental purposes it is convenient to use the ordinary agar medium in large test tubes to which has been added, as above, about 2 c.c. of the sterile larvae filtrate. These agar tubes are then inclined and the surface of the congealed agar is inoculated. In no case should the larvae or filtrate reach a high temperature. The object, of course, is to obtain a medium which

contains the food constituents which are afforded the bacteria in the living larvae.

Inoculation experiments have been made by feeding to a healthy colony the scales from combs which had contained brood affected with American foul brood. The result of the feeding was that the colony became affected by disease, the symptoms of which were the same as those observed in the apiary where American foul brood is found. Like symptoms have been produced by feeding scales which had been put into ordinary meat bouillon incubated for 24 hours, and then heated to 65 degrees C for twenty minutes.

On microscopic examination of the decaying larvae dead from the disease thus produced experimentally, the same large number of spores and rods are seen as when samples are examined which are taken from apiary affected with American foul brood. From these dead larvae pure cultures of *Bacillus larvae* were obtained from plates, using the new medium described above. These experiments show that by the feeding method the disease may be produced and that the contagion is found in the scales. The second experiment tends to indicate that the cause of American foul brood as found in the scale is not killed by heat at 65 degrees C. applied for 20 minutes.

Up to the present time there is no authentic record of this disease having been produced by experimental inoculations of pure cultures.

Knowing that by the feeding method the disease may be produced, pure cultures of *Bacillus larvae* have been mixed with sterile sugar syrup and fed to healthy colonies with the result that the disease appeared in the colonies within three weeks with symptoms identical with those produced by feeding the scales of the disease. In the ropp brown mass which is produced experi-

mentally by *Bacillus larvae* same large number as when the feeding the scales is found in an of *Bacillus larvae* from the larvae ease produced ing pure culture

Some European brood diseases that it is impossible they are in descriptions of microscopically entirely too broad led to much necessitate much part of other insects also added to From what can papers, the author that Burri has *Bacillus larvae* to it as the "bacterium;" that Maassen referring to it as *Bacillus larvae*, and that referred to *Bacillus larvae*. It is hoped that soon cease to exist

In the study of this new medium additional facts have been noted in the morphology of this organism given in a bulletin the near future.

It is now because it is one German in Maassen, to fall in pretation of certain is that this species produces a large number of flagella. (Giant whips. It is believed to be in situation of flagella, the bacteria. These gi-

mentally by feeding pure cultures of bacillus larvae there are found the same large number of spores and rods as when the disease is produced by feeding the scales or when the disease is found in an apiary. Pure cultures of bacillus larvae have been obtained from the larvae dead from the disease produced experimentally by feeding pure cultures of bacillus larvae.

Some European investigators of brood diseases omit the symptoms, so that it is impossible to tell which disease they are investigating. Their descriptions of micro-organisms also are entirely too brief. These facts have led to much confusion, and they necessitate much additional work on the part of other investigators. They have also added to the present confusion. From what can be gained from their papers, the author is inclined to believe that Burri has been working with bacillus larvae and has been referring to it as the "bacillus difficult of cultivation;" that Maassen has been working with bacillus larvae and has been referring to it as bacillus brandenburgensis, and that von Buttell Reepen has referred to bacillus larvae as "B. burri." It is hoped that this confusion may soon cease to exist.

In the study of bacillus larvae on this new medium some interesting additional facts have been observed in the morphology and cultural characters of this organism which will be given in a bulletin from this Bureau in the near future. One fact is mentioned now because it seems to have caused one German investigator, Dr. Albert Maassen, to fall into error in the interpretation of certain findings. This fact is that this species, bacillus larvae, produces a large number of giant whips. (Giant whips are at present believed to be in some way a modification of flagella, the motile organs of bacteria. These giant whips appear in

pure cultures of bacillus larvae and persist there for a long time. The structures which Maassen evidently saw and reported in two different publications, naming them Spirochaeta apis, are nothing other than giant whips which normally belong to bacillus larvae, and which are formed by the growth of bacillus larvae in the larvae of the bee.

Maassen seems to have no further evidence that the structures which he saw are spirochaetes than what could be gained by a microscopic examination of the remains of the dead larvae which had suffered from this disease. The appearance which he interprets as a spirochaete in the process of division can be seen in the giant whips obtained from pure cultures of bacillus larvae. These giant whips are found in the decaying larvae which are dead from American foul brood experimentally produced by feeding pure cultures of bacillus larvae.

The author has observed these structures in a large number of examinations of American foul brood, especially in the hanging-drop preparations made directly from the dead larvae. There is nothing else contained in the dead larvae which can be seen that resembles a spirochaete, and since Maassen made no mention of the giant whips found there so abundantly, it is quite certain that he has made this mistake.

This preliminary note will be followed by a bulletin which will contain in full the results of recent investigations by others on the brood diseases of bees and a detailed account of the work done here.

The results may be summarized as follows:

(1) In previous publications the author has made no claim that bacillus larvae is the cause of American foul brood.

(2) A medium has been devised by

which cultures of bacillus larvae may be obtained in large quantities suitable for experimental inoculation. This medium consists of the sterile filtrate obtained by diluting and filtering the crushed bodies of the bee larvae through a Berkefeld or other fine filter.

(3) American foul brood has been produced by feeding pure cultures of bacillus larvae, and the symptoms of the disease are the same as those pro-

duced by feeding the scales of this disease and as those observed in the apiary where colonies are affected with this disease.

(4) The structures described by Dr. Maassen, of Dahlem, Germany, as spirochaetes and named by him Spirochaeta apis are not spirochaetes, but normal structures produced by the growth of bacillus larvae. These are known in bacteriology as giant whips. Washington, D. C., July 15, 1907.

The Beginner's Page

Department Conducted by E. G. HAND

Preparing for Winter.

Don't put off preparations for winter any longer than can possibly be avoided. The sooner after the white honey harvest is over that the bees are prepared for their winter snooze the better for all concerned, unless, of course, there is a fall flow of honey from buckwheat, golden rod, or some other source. But as a rule the beginner had better not figure on his bees storing honey in September, or August either, for that matter.

The first thing to be done after the supers are removed is to see that each colony has a laying queen and a good number of bees—enough to cover all the combs in an eight-frame hive on a day inclined to be cool will generally make a satisfactory cluster for wintering. To be sure that there is a queen, each hive must be opened and brood looked for. A good queen generally has a certain amount of brood in her hive until the first of October. Look about the centre of the hive, and if a nice patch of sealed brood is seen on two or three frames, or even on one,

the colony may be passed as all right in that respect. If a hive is found with no brood, when other hives have a reasonable amount, a search should be made for the queen. If she cannot be found, she is probably not there, but if she is, and is good for anything, her presence can be detected by giving a little feed to the colony in a feeder each evening for a week. This will make the queen commence to lay, and the eggs may be easily seen. Unless a queen is much valued, however, or it is desired to winter as many as possible, it does not pay to spend too much time hunting a queen this time of year. In an apiary of any size, even a small one, there are nearly always a colony or two too light in bees to put into winter, though they may have good queens. When a populous colony is found queenless, unite with one of these small colonies having a good queen, and every thing will be all right. When a colony is found that has been queenless for a long time, so that "laying workers" have made

their appearance in the hive is possible. The appearance of brood from the workers is so that of a colony of a good queen will notice it a "proper" brood almost level with this freak brood is very uneven cappings bulge places, and have an appearance of roughness. The appearance of many numbers of bees there is. So does a "drone" there is this difference between the beginning and the end of the winter; that the eggs are nearly all on the sides of the cell. The way to the laying of a drone-laying in their proper place in the cell. This is due to the fact that the worker bee is unable to reach the bottom of any kind of a cell. A laying queen is destroyed and the colony is one having a good queen. After seeing that the good queens and the bees must be weighed to see if sufficient honey is present. An eight-frame hive with cover, bottom board, and all things complete, should weigh at least sixty pounds if it is to be wintered. If it is to be wintered over fifty pounds is right, but a few pounds more is safer. A ten-frame

their appearance, and as a consequence the hive is populated chiefly by little drones, it is no use bothering with. The appearance of a comb containing brood from the eggs of these laying workers is so entirely different from that of a comb containing the brood of a good queen that even a novice will notice it at first glance. Whereas "proper" brood is capped evenly, and almost level with the top of the cells, this freak brood of the laying workers is very uneven and patchy, with the cappings bulged away up in some places, and having the general appearance of rough ground, or a field covered with boulders. Laying workers lay any number of eggs in a cell—as many as there is room for, sometimes. So does a "drone laying" queen. But there is this difference, which will enable the beginner or anyone else to distinguish between the work of the two; that the eggs of the laying workers are nearly always stuck to the sides of the cell about two-thirds of the way to the bottom, while the eggs of a drone-laying queen will be placed in their proper place in the bottom of the cell. This difference is no doubt due to the fact that the abdomen of the worker bee is not long enough to reach the bottom of the cell, while that of any kind of a queen is. A drone-laying queen is no use and must be destroyed and her colony united with one having a good laying queen.

After seeing that all colonies have good queens and enough bees, each hive must be weighed to find whether there is sufficient honey in it to winter the bees. An eight-frame Langstroth hive, with cover, bottom-board and everything complete, should weigh in the fall, say at the first of October, at least sixty pounds if it is proposed to winter the bees on their summer stands. If to be wintered in a cellar anything over fifty pounds will generally be all right, but a few pounds more is usually safer. A ten-frame hive should weigh

about 10 lbs. more than an eight, for equal results. When weighing, if hives are not built all alike, allowance must be made for variations in weight of lumber or other material in their make-up. The weights given above are for ordinary hives of well-seasoned one-inch pine lumber, with single board covers and reversible bottoms. Mark the weight on each hive at the time of weighing, and after the weighing is done, get the light ones up to proper weight. If one has some heavy combs of honey saved from the extracting supers, it does not take much time to do the feeding. Simply open the light hive take out an empty, or nearly empty, comb, or more than one if necessary, and replace them with full ones. Arrange the combs so that all those containing much honey may be near together, any which are nearly empty being placed by themselves at one side of the hive. By arranging the combs this way, the bees do not find it necessary to move across empty combs to get at the full ones during the winter, as would happen if half the honey is at one side of the hive, and half at the other, with empty combs between. If no full combs are to be had the bees may be fed up to weight on granulated sugar, mixing equal parts by weight of sugar and water and melting it upon the stove and feeding in a feeder or some kind of dish inside the hive or in an empty super body set on top of the hive. A shallow pan placed on top of the frames, and with a piece of thin wood just a trifle smaller than the inside of the pan placed in to float on the feed, so that bees may not fall in and be drowned, works all right. Place warm feed in the pan each evening, as much as the bees will take down in the night, and get them up to weight as fast as possible. Better feed to five pounds or so over weight, as they will go back that much after feeding stops. Get the feeding done soon as possible, and look out for robbers while doing it.

Fenelon Falls, Ont.

THE CANADIAN BEE JOURNAL

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Editor, W. J. Craig.

SEPTEMBER, 1907.

THE EDITOR'S CORNER.

The absence of the Editor, who is at present holidaying at Bala Park, Muskoka, accounts for the lateness of this issue, and also for the omission of the usual notes under this heading.

The Ontario Bee-keepers' Association will hold their annual convention in Toronto November 13, 14 and 15, the week of the Fruit, Flower and Honey Show. A splendid program has been prepared for the convention, a few of the addresses being as follows: "A Chapter of Mistakes," by R. H. Smith; "Foul Brood," by Miss Trevorrow, of Meadowvale; "Comb Honey," by S. D. House, New York state; "Distribution of Honey," by W. A. Chrysler, Chatham; "The importance of keeping the brood nest clear of capped honey by a moderate use of the extractor, either in the production of comb or extracted Honey," by E. W. Alexander, Delanson, N.Y.; "The Condition of the Industry in Ontario," ten-minute reports from the six apiary inspectors. These latter series of addresses should be full of interest. Owing to the excessive loss of the past winter, the bee-keepers should more than ever pay greater attention to the condition of their colonies at all times of the season. The inspectors have been visiting thousands of apiaries during the past year, and will perhaps more than any other bee-keepers

have acquainted themselves with the conditions that make for success in the industry. Their report as to the state of foul brood will also be of exceeding interest.

The honey show will be on a different basis again this year as the committee has decided to go back to the system of offering prizes. A Liberal sum is being put up and bee-keepers all over the province should take advantage of this opportunity to exhibit their product. Too much emphasis cannot be laid on this Show as a means of advertising owing to the immense population centred around Toronto.

A splendid musical program is being offered at the Show again. Toronto's four leading bands have been engaged for the evenings, and a splendid orchestra and other music for afternoons.

Entries should be made through the secretary of the Association, Mr. P. W. Hodgetts, Toronto, at as early a date as possible.

THE HONEY SHOW.

Canadian National Exhibition.

The poor honey season affected very visibly the exhibits in this department this year. The display as a whole, however, was very creditable to the few bee-keepers who represented the industry at the Exhibition.

Mr. D. Anguish, Scottville, carried off the first prize for best general display, also for the display of granulated clover honey and 300 lbs. comb. Mrs. Anguish secured the prize on the best 24 sections.

Mr. George Laing, Milton, took first prize on beeswax; 300 lbs. liquid extracted clover honey; 100 lbs liquid extracted basswood honey, and 50 lbs granulated basswood honey.

Mr. Arthur Laing, St. Thomas, secured first on display of "any other variety," and a large number of seconds on other displays.

Mr. Grainger was awarded the servatory hives, honey suitable

The new honey adian National isfactory. It is the tall window

Prize List

1. Best 20 doz finish to points .
2. Best five doz finish to points .
3. Best one doz finish to points ..
4. Best 200 lbs 100 lbs li
5. Best display
6. Best 10 lbs
7. Best 10 lbs
8. Best 50 lbs
9. Best display able for sections, ages suit
10. Best 25 lbs F
11. Best two doz
12. Best 10 lbs
13. Best exhibit the most mestic pu
14. Best and mos use
15. Best display visitors ..
16. Best method ing twelve
17. Best packages honey, sho
18. Best package package to

Mr. Grainger, Deer Park, Toronto, was awarded the prizes on bees in observatory hives, also on the exhibit of honey suitable for grocers' window.

The new honey building at the Canadian National Exhibition is very satisfactory. It is commodious and bright, the tall windows coming down to al-

most a level with the tables, behind the displays of honey, gives the best possible effect. The arrangement of the building is such that there is very little if any "choice position," a feature which is certainly very desirable, and does away with any little strife that might arise for location.

Prize List O. B. K. A. Honey Show, to be held Massey Hall, Toronto, November 12 to 16.

	1st	2nd	3rd	4th
1. Best 20 dozen of Comb Honey in sections, quality and finish to count 80 points, display 20 points, total 100 points	\$15	\$12	\$9	\$6
2. Best five dozen of Comb Honey in sections, quality and finish to count 80 points, display 20 points, total 100 points	8	6	4	2
3. Best one dozen of Comb Honey in sections, quality and finish to count 80 points, display 20 points, total 100 points	4	3	2	1
4. Best 200 lbs of Extracted Liquid Honey, to be displayed 100 lbs in glass, balance in tins	12	9	6	4
5. Best display of 50 lbs Extracted Liquid Honey in glass	5	4	2	1
6. Best 10 lbs Extracted Liquid Clover Honey in glass....	4	3	2	1
7. Best 10 lbs Extracted Liquid Linden Honey in glass..	4	3	2	1
8. Best 50 lbs of Extracted Granulated Honey	6	4	3	2
9. Best display of 200 lbs Comb and Extracted Honey suitable for a grocer's window or counter, comb to be in sections, extracted in glass jars, tins or other packages suitable for general grocery trade	10	7	4	2
10. Best 25 lbs Extracted Buckwheat Honey in glass.....	4	3	2	1
11. Best two dozen of Buckwheat Honey in sections.....	4	3	2	1
12. Best 10 lbs of Beeswax.....	3	2	1	..
13. Best exhibit of six articles containing honey, showing the most practical methods of using honey for domestic purposes	4	3	2	1
14. Best and most practicable new invention for bee-keepers' use	5	3	2	1
15. Best display of bees and queen which may be seen by visitors	10	8	6	4
16. Best method of crating and packing comb honey, showing twelve section cases ready for shipment ..	7	5	8	2
17. Best packages for long distance shipment of extracted honey, showing method of packing and crating same	7	5	3	2
18. Best package for retailing extracted granulated honey, package to be filled	3	2	1	

Bee Disease in the Isle of Wight

The attention of British Bee-Keeper has recently been drawn to a rather peculiar disease among bees in the Isle of Wight, which in many instances resulted in the loss of whole apiaries. The symptoms of the disease described are so similar to an affection occasionally met with in our own country and mentioned more than once in these pages, that we copy in part the report of the Isle of Wight Board of Apiculture appearing in the "British Bee Journal."

Symptoms of the Disease—The earliest noticeable symptom of the disease is the inability of the affected bees to fly more than a few yards without alighting. As the disease progresses the bees can only fly a few feet from the hive, and then drop and crawl about aimlessly over the ground. They are often to be seen crawling up grass stems or up the supports of the hive, where they remain until they fall back to the earth from sheer weakness, and soon afterwards die. In a badly-infected stock great numbers of bees are to be seen crawling over the ground in front of the hives, frequently massed together in little clusters, while others remain on the alighting-board. If the hives be opened, numbers of diseased individuals will be often met with inside. They are found clustered together around the queen and show very little inclination for movement until disturbed, and are entirely unable to fly. Badly-diseased individuals show very little inclination for stinging; those that are less severely attacked often sting very actively.

If a badly-diseased bee be carefully examined it will be seen to have lost its power of flight, and it crawls about with the hinder extremity of the body dragging on the ground; frequently it walks about with its wings "out of joint," the hind wings protruding obliquely upwards and above the anterior pair. The only other external symptom of the disease is seen in the abdomen, which is frequently distended beyond its normal proportions. This distension, however, is not by any means constant, and was chiefly noticed in the case of the native bee; in the half-breed with the Italian bee, with its longer and slightly more slender abdomen, no unusual distension could be observed.

The disease appears to differ from what is usually termed "bee-paralysis" in that the infected individuals do not exhibit the characteristic black and shiny appearance, and neither I myself nor any bee-keepers who have paid attention to the disease have observed the curious trembling motion of the limbs and body which is regarded as a symptom of that disease.

The disease appears to be entirely confined to the adult bees, the brood remaining unaffected. I have conducted a microscopical examination of a large number of eggs, larvae at all stages of development, and pupae and have failed to detect anything of a pathological nature among the brood. All had the characteristic pearly-white appearance of healthy specimens, although belonging to a badly-infected hive. The eggs were undergoing devel-

opment and showed trace of discoloration. The larvae were healthy and were coiled up in the cells and nothing was observed with the pupae.

A number of hives were examined which have been destroyed by the disease. The most prominent of the color was an instance found grating the queen. That the last member of the colony is also in accordance with the experience of bee-keepers.

Affected stocks in the spring show symptoms of dysentery. The excrements over the hives, floor, and around the hive, and the dryness of a long streak of material. The bees in this condition is often winter confinement. A comb constructed during the summer months shows indications of dysentery in the hive.

After the winter the bees are all on the wing and are not noticeable, and all that have been diseased show the opposite condition. The digestive system of a number of diseased bees examined microscopically was taken from infected hives in different localities. A color was found to be yellowish-brown in color. It was greatly affected when these contents came in contact with the atmosphere. The color was the same as that observed inside the hives in winter. Microscopical examination reveal the presence of a number of pollen grains.

opment and showed not the slightest trace of discoloration or shrivelling, the larvae were healthy in every way, and were coiled up in their normal attitude, and nothing wrong could be detected with the pupae or newly-hatched bees.

A number of hives have been examined which have been completely destroyed by the disease, and the last remnant of the colony to die was in each instance found grouped together around the queen. That the queen is almost the last member of a hive to succumb is also in accordance with the experience of bee-keepers in the island.

Affected stocks examined in early spring show symptoms similar to those of dysentery. The bees discharge their excrements over the combs and on the sides, floor, and alighting-board of the hive, and the dry faeces take the form of a long streak of a dirty red-brown material. The bee-keepers state that this condition is only present after the winter confinement within the hive. A comb constructed by a diseased stock during the summer does not reveal any indications of dysentery being present in the hive.

After the winter is over and the bees are all on the wing, no dysentery is noticeable, and all the diseased bees that have been dissected showed the opposite condition of distention of the gut. The digestive system of a large number of diseased bees has been examined microscopically, the bees being taken from infected hives from four different localities. In all instances the colon was found to be filled with a yellowish-brown material, and in many cases it was greatly distended with it. When these contents are dried in contact with the atmosphere they assume the same colour as the excrement noticeable inside the hives at the close of winter. Microscopical examinations reveal the presence of an enormous number of pollen grains differing in

their species in different bees. An examination of this pollen has shown that no particular type of grain is present in all diseased bees. In addition to pollen, a variable quantity of a bright yellow amorphous material is also present.

Nature of the Disease.—The disease is eminently one of the digestive system, and might be described as being a condition of enlargement of the hind intestine. Over 150 diseased bees have now been examined, and all have been found to exhibit the same symptoms.

The colon and adjacent part of the rectum are enormously distended with a congested mass of material, consisting primarily of pollen grains. The distension is so marked that this section of the alimentary canal becomes extended from two and a half to four and a half times its normal capacity. When the dorsal integument of the bee is removed, the greater part of the abdominal cavity is seen to be occupied by the very greatly enlarged hind intestine. In extreme cases the rectum almost as far as the anus is also distended, and the small intestine as well. At first sight it would appear as if the chyle stomach was greatly distended, but further examination shows that the latter becomes pushed to some extent out of its normal position and is partially flattened by the pressure that is exerted upon it. The greater part of the abdominal cavity, which is normally a haemocoelic space, is thus occupied, and, furthermore, the distended colon exerts pressure on the large abdominal air-sacs of the tracheal system and so interferes greatly with their functions. The insect is therefore unable to expand them with sufficient air, which is necessary for flight, and this feature, coupled with the additional weight, in the digestive canal, renders the insect incapable, when badly dis-

eased, of flying about. The movements of the legs are not impeded, but the insect only seems to have energy to crawl about in a lethargic fashion. The fact that it cannot fly is not due to paralysis of the wing-muscles; diseased bees have been kept under observation, and occasionally they have been seen to vibrate their wings actively with a familiar buzzing sound. Moreover, if a diseased bee be held under the thorax lightly with a pair of forceps it will vibrate its wings very rapidly in its efforts to free itself, thus showing that there is no paralysis of the wing muscles. Bees in the last stage of the disease, however, do not seem to have strength to move their wings at all.

While the hind intestine is thus gorged with pollen, etc., the stomach and the remaining portion of the digestive canal contain very little solid matter of any description. Some amount of a dark-colored fluid is present very often in the chyle stomach, but it is not distended with it.

The contents of the rectum and colon examined consisted of pollen grains for the most part, together with a variable quantity of a bright yellow substance in amorphous masses, and a large number of bacteria. There is no individual type of pollen, grain common to all the bees examined (the digestive contents have been studied in about 100 examples), but in an individual bee there has always been found one species of pollen in much greater abundance than the others.

Very occasional grains of other species are always met with in addition. These facts demonstrate that the bees have a partiality for a particular species, but do not confine their attention solely to it. A healthy bee out on a foraging expedition confines itself to a single type of plant.

The contents of the pollen grains

were found for the most part to be partially digested, and in many cases only the empty coats were remaining. They are but little crushed or distorted, and their species could probably be identified if necessary.

I have not seen a single diseased bee carrying pollen in the "pollen basket" situated on the posterior legs. What pollen they collect they apparently eat.

An examination of the blood has also been made; samples of blood were obtained (a) by removing a leg; (b) by removing the dorsal wall of the thorax. The blood preparations were stained in some cases with Leishman's stain and in others with carbol-fuchsin, but in no instance was any conclusive evidence of bacteria obtained.

The blood showed a great paucity of corpuscles and contained large numbers of minute, highly retractive "granules." They are visible in all the films made and do not appear to stain. There are none of the large fat globules present as figured by Cheshire in the blood of healthy bees.

The stored pollen from a diseased hive has also been examined and smears made in the same way as in the case of the blood. A few bacteria in the form of short rods were to be detected.

At the present time cultures are in progress, and samples from the contents of the colon, from the blood, and from stored pollen have been taken. These have been incubated in broth and plated in gelatine, and have been kept at room temperature and at 37 deg. C. No growth of any kind has resulted from the blood, a very slight growth from the pollen, and a very mixed growth of bacteria and a yeast (in small numbers) from the colon. The bacteriological work cannot be fully reported on or any conclusions drawn from it. If any conclusions are to be

drawn from it, healthy stock v. been isolated.

Possible Cause of Present Disease

Under normal conditions very little pollen is eaten by the bees themselves, but a great deal of pollen is used in the process of brood rearing. The necessary conditions for the development of the disease are a high temperature, a high humidity, and a high concentration of pollen, which is accumulated in the hind gut. If, however, the bees are kept in an unusually warm place during winter, the incidence of the disease is increased, "dysenteric conditions" being observed. The bees are chilled by "flapping" their wings, and by means of other means of over-heating, the production of heat is about at the level of the normal, and carbohydrates are not made good use of. The nitrogenous food in the pollen is, therefore, not used in large quantities. Under these conditions the bees frequently die, and the disease is observed in a previous paper of the gut being enlarged. This condition is apparently true of the bees examined by Cheshire, and is of a fungoid (yeast?) nature. There appears to be a connection between these conditions and the disease under consideration. Possibly the bees are predisposed to the disease by the conditions they may be subjected to. It is mentioned that the disease is to be similar in nature to the one mentioned. It is noteworthy that the disease is not observed in the laboratory.

drawn from it, it is necessary to infect healthy stock with the germs that have been isolated.

Possible Connection between the Present Disease and "Dysentery."—

Under normal conditions hibernation entails very little wear and tear to the bees themselves, and consequently tissue metabolism is comparatively small. The necessary food under such conditions comprises but a small quantity of pollen, which alone results in the accumulation of any solid residue on the hind gut. If, however, through neglect or an unusually severe or very damp winter, the inmates of a hive get chilled, "dysenteric conditions" often supervene. The bees attempt to counteract chilling by "flapping" their wings and by means of other movements. This production of heat is naturally brought about at the expense of the tissues, and carbo-hydrate food is insufficient to make good the wear and tear. Nitrogenous food becomes necessary, and pollen is, therefore, consumed in large quantities. Under these circumstances the bees frequently discharge themselves over the comb, as already noted in a previous paragraph, on account of the gut being overcharged with pollen. This condition is not, however, apparently true dysentery, for, according to Cheshire, the latter is due to a fungoid (yeast?) growth causing the distension of the hind gut.

There appears, however, to be some connection between the "dysenteric conditions" noted in the diseased hives and the disease at present under consideration. Possibly the former renders them predisposed to the latter, or they may be phases in one and the same disease. It has been already mentioned that the excrements appear to be similar in both cases.

It is noteworthy that about 5 per cent. of the diseased bees kept under observation have been noticed to dis-

charge their excrement. This fact seems to suggest that the disease may possibly be amenable to the action of some suitable drug mixed with the food of the bees.

The death of the bees seems to be brought about finally by blood poisoning, partly by the accumulation of toxins derived from the congested mass of waste material in the co'lon, and to some extent by the imperfect oxygenation of the tissues, owing to the pressure exerted on the abdominal air-sacs.

The demand for nitrogenous food brought about finally by blood poisoning characters of the disease, but why the demand should arise is a question which it is not possible at present to answer. As an experiment it might be worth while to supply liquid nitrogenous food and to remove the greater part of the pollen from the combs in winter.

Remedies tried by Bee-keepers.—

Numerous remedies have been tried by different bee-keepers. The most successful case appears to be that adopted by a Shanklin keeper, who has successfully brought hives over from last year by feeding with cane-sugar, and up to the present they seem to be perfectly healthy. Others, however, have tried the remedy without any success. Several bee-keepers have tried requeening, but only eventually to lose their stock. Importation of new swarms from the mainland has not been attended with any success. Syrup medicated with naphthol beta, izal, and with sulphur have all been experimented with, and also alcohol. Dusting with sulphur has also been tried, and also dusting and medicated feeding combined. No permanent success has attended any of these measures.

Remedial Measures Suggested.—

I would suggest that all the remaining diseased stocks be destroyed and the hives be thoroughly charred inside and

out, and afterwards repainted. All instruments used in connection with bee-keeping should be disinfected. During the coming winter all fresh and already existing healthy stocks should be well looked after and kept warm, dry and well ventilated, and every care taken that no chilling or damping takes place. Whenever possible on warm days the bees should be allowed to take cleansing flights and be confined as little as possible. The tendency of the bees to distend themselves with pollen should be prevented as far as possible by removing the greater bulk of the stored pollen, and such nourishment as is obtained from the latter should be supplied to them in a liquid form mixed with the artificial food. The bee-keep-

ers are advised to experiment with bee-jelly or a meat extract of a similar nature. This should be mixed with enough water to make it fluid, and then strained through very fine muslin and mixed thoroughly with honey or a suitable sugar syrup (both methods should be tried). Several pounds of the mixture should be given at a time in the early autumn and placed in the top storey of the colony to be fed, just about night-time. This will give the bees a chance of storing it away quickly and care should be taken that they have plenty of the food.

This course of treatment is suggested as worthy of a trial, but it has not yet been possible to test its value experimentally.

A Few Things Not to Do In Bee-Keeping

(By E. W. Alexander, Delanson, N. Y.)

While we are so free to tell the inexperienced what they should do in order to succeed, would it not be well to remind them of some things they should not do?

Inventing Hives.

First, don't spend either time or money in trying to construct a new form of hive—not but that there are some serious faults in nearly all of our standard hives, but let the experienced bee-keeper remedy those faults.

Management of Weak Colonies; How to Prevent Robbing.

Don't allow your bees to acquire the habit of robbing. Hundreds of weak colonies are lost annually by this pro-

voking habit which is frequently caused by the neglect of their owner. One of the worst features of taking our bees from their winter quarters, a few at a time, is that it almost invariably starts robbing. The colonies that are taken out first and have had their cleansing flight, being well located are in prime condition to attack every colony that is taken out later, and before they become located the bees from those that were taken out first have full swing at their less fortunate neighbors. In order to prevent this costly and unpleasant state of things, where you have to set out your bees at different times, first contract the entrance of every colony; then as soon as you find a colony that is being rob-

bed, even though close it up an days; then if them on top a queen-excluder have no brood give them a from some other

In putting this way don't any more than the stronger or watch on your as above described all of your weak trouble, and at your apiary from moralized cond frequently do when colonies which with but little

A Caution Against

Then the desire most sure to to divide his colonies that they are a for surplus or don't make you you do, you with prospect of security the chances are many colonies (winter.

Keep Good Bees

Then don't be bees that are not This is the price bees for; and if good surplus who sede their queer good honey-gather

Then don't produce poor comb honey. You for producing poor man has for produce a quality

bed, even though it is only just started, close it up and keep it so for several days; then if they have any brood, set them on top of a strong colony with a queen-excluder between. If they have no brood, and still have a queen, give them a comb containing brood from some other colony.

In putting two colonies together in this way don't disturb either of them any more than you can help, especially the stronger one. If you keep a close watch on your apiary and treat them as above described, you can save nearly all of your weak colonies with but little trouble, and at the same time prevent your apiary from getting into that demoralized condition which they frequently do when they find several weak colonies which they can overpower with but little loss of bees.

A Caution Against Making Increase Too Rapidly.

Then the desire for more bees is almost sure to tempt the inexperienced to divide his colonies to that extent that they are almost worthless, either for surplus or to try to winter. So don't make your increase too fast. If you do, you will not only lose your prospect of securing a fair surplus, but the chances are that you will lose many colonies during the following winter.

Keep Good Bees and Produce Good Honey.

Then don't be contented in keeping bees that are not good honey-gatherers. This is the principal thing we keep bees for; and if they fail to give us a good surplus when they should supersede their queens with queens of a good honey-gathering strain.

Then don't produce poor-looking comb honey. You have no more excuse for producing poor stuff than the dairyman has for producing poor butter; but produce a quality that you will take

pride in stamping on every package of it your name and address.

Some Good "Don'ts."

Don't set your bees in a place where they will annoy the public. Either keep them where they will not disturb anyone, or sell them and go out of the business.

Don't allow drone comb in any hive except one or two, and see that these hives have choice breeding queens. There is no more profit in keeping a colony of bees where a large per cent. of their combs is drone comb than there would be in keeping a poultry-yard of roosters.

Don't allow king birds, skunks, toads and snakes to hang around your apiary. If you do they will weaken the working force of every colony.

Don't think that bees will give you good results in either increase or surplus honey if you neglect them and fail to do your part. The day is past when the word "luck" has any bearing on bee-keeping. The man who conducts his business in a careless, slipshod way, taking it for granted that this and that will come out all right, is only fooling himself; and the sooner he realizes it to be a fact, the better for all concerned. So, don't try anything of the kind, but look close to all the minor parts; and when you have united them into one fine method for practice you will be well rewarded for your study and perseverance.

Don't spend any time in worrying over the frequency of poor seasons, but spend your time in preparing your bees to make the most they can of any kind of season that comes, then you will be almost surprised to see how few poor seasons there are. We have not had a really poor season in 25 years, while some of my neighbors complain of a poor season nearly every summer.

Second-Hand Honey Packages.

I almost beg of you not to buy second hand packages to ship extracted honey in. I don't know when I ever read better advice than our friend Muth gave us a short time ago in "Gleanings" on this subject. Don't use those poor packages. If you do, you not only bear down the market price of honey but you indirectly raise the freight rate.

Don't bother with starters of comb foundation in your breeding or extracting frames; but put in full sheets of foundation and prevent your bees from building that worst nuisance of the apiary—namely drone comb. The man with a few colonies may have time to fuss with starters; but if you have many hives to care for, the sooner you cut out this starter business, and the shifting around the apiary of brood, the better it will be for your net income. The earlier in the spring you can have every hive in your apiary and every comb in those hives filled with worker brood, then keep them so to the end of the season, the less reason you will have to worry about poor honey seasons and over stocking. We have never had a strong colony of bees backed up with a hive full of worker brood fail to give us a good surplus.

Preparing for Winter.

Don't neglect to prepare your bees early in the season for winter. This part of the business should here at the north be all finished before September 10. To a certain extent we are preparing our bees all summer for the next season; then when the final finish comes, the last of August, we have but little to do, and I am sure that they will winter with less loss if they have a chance to quiet down and are undisturbed during the fall months.

Don't try to winter weak colonies. If you are anxious to save all you can, then feed them syrup made from gran-

ulated sugar as soon as the harvest commences to close, so as to keep them breeding until they are strong in bees. If you attend to them in this way they will often be your best colonies in the spring; but if you cannot do this you had better unite two or more together in the fall, for a weak colony in the fall is usually a dead one in the spring.

Don't try to winter a queen the third winter. I am sure it doesn't pay. She is almost sure to die, either in the winter or early spring, and if she lives she is so slow to start brood in the spring that you will have a weak colony until midsummer, and it will require more valuable time to build it up than three queens would cost.

Don't fail to keep your bees as warm and comfortable as is possible during the first four or five weeks after taking them from their winter quarters. We contract the entrances of all colonies to $\frac{3}{8}$ by 1 or 2 inches. In doing so it prevents robbing to quite an extent, and helps them to enlarge their brood-nest, which is very important at this season of the year. We also try to retain all the heat we can at the top of the hive. We put a piece of canvas first over the top of the frames, then a board under cover, cleated so as to form two dead-air spaces, then our outside telescope top, which is kept well painted so as to prevent any rain from entering the hive. You may think this is taking more pains than is necessary. We think it has much to do toward helping the bees to give us a nice surplus during the summer.

Don't put your bees into winter quarters that will subject them to unnatural conditions. If you do you will lose many colonies, both during the winter and spring. It is almost impossible to save a colony that has been poorly wintered. We may talk and write of the thousand and one differ-

ent things concerning bee-keeping, summed up the of as much interesting. We could following seasons when taken from if they were be made from

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ent things connected with successful bee-keeping, but when they are all summed up the whole combined is not of as much importance as perfect wintering. We could make more money the following season from strong colonies when taken from their winter quarters if they were in nail-kegs than could be made from little weak sickly col-

onies in the best hive that was ever constructed.

I will close by saying, before I run off on the subject of wintering, that close attention to all things connected with your bees is the magic word that unlocks the door to success in bee-keeping.—"Gleanings in Bee Culture."

Feeding Back Extracted Honey

How This Plan Can be Made Profitable in the Production of Comb Honey; the Importance of Thinning the Honey, and Feeding During a Natural Honey-flow.

(By E. W. Alexander.)

Feeding back extracted honey for the purpose of completing unfinished sections is not generally considered profitable, but possibly like in many other things in bee-keeping, success or failure depends largely upon when and how the work is conducted. Mr. Alexander of New York is an advocate of the system, having carried it out advantageously for a good many years. He emphasizes the above points in the following article in "Gleanings in Bee Culture":

Friend Reddout calls my attention to this subject in a recent number of "Gleanings." He can hardly see why there should be such a difference of opinion on this subject as there seems to be. I also can not see how there could be any variation in the results, only such as would naturally follow from the difference in the time of the season in which the feeding was practiced, the quality of food, and in the way in which it was given.

My first experience along this line was something over 30 years ago. The honey fed was thick extracted, and fed in its natural state after the August

harvest was past. This I fed for the purpose of finishing up partly filled sections. I soon found this was a very unnatural time of the year for bees to build comb, as nearly every night was quite cold, with frequent frosts. I also found that it took on an average a little more than three pounds of extracted honey fed in this way to produce one pound of comb honey, and it frequently granulated in the sections in a short time so as to spoil their take.

I next tried thinning the honey with boiling water to about the consistency of nectar. This made a great difference in results. The bees took it from their feeders more readily, and it did not require nearly as much honey to fill their sections, and I was not troubled any more with its granulating in the combs; but I was not satisfied to stop here when I could see that it required nearly two pounds of extracted honey to produce one of comb, and I realized that I was fighting natural law in trying to force my bees to produce comb honey decidedly out of season.

My next step was to make extracted honey very thin with hot water, and

feed it to certain colonies producing comb honey during the entire summer harvest, giving each colony about all it could handle during the night. At first I was afraid it would have a tendency to check their work during the day; but, not so. It seemed to act as a stimulus to still greater activity when they could go to the flowers. Then I felt I had solved the problem of producing comb honey from extracted. There were no more partly filled sections to bother with; no more travel-stained sections to sell at a reduced price, but every one nicely filled out clear to the wood, and well capped.

I then found I had at my control for about 60 days as rich a harvest for the colonies I ran for comb honey as I could desire, and with not a break of even a day it was a pleasure to see those sections filled with choice comb honey.

I don't think it possible to feed thick extracted honey to bees for the purpose of producing comb honey so as to derive any profit from it after the honey-producing season is over. I think that nearly all those that have ever tried it, and went only so far along this line, have given it up in disgust. But when I took up this line of the business I went much further than any I had ever heard of, and made it a success.

The day is coming when the comb-honey producer will find it as I have stated above. He will have complete control of his harvest for comb honey simply by keeping a few more colonies and running them wholly for extracted honey to help his comb honey colonies along during those natural changes of the atmosphere which frequently cause the flowers to stop secreting nectar several days at a time. Then the bees stop working in their sections, their combs turn yellow, and, if the honey-dearth lasts many days, as it sometimes does, it requires a good harvest to start them at work again in their sections, and then those sections will never sell for the highest market price.

This can all be prevented when there is a good feeder under every hive, and tanks full of extracted honey.

There must be some comb-honey producers who can throw some light on this subject; and, although I am out of this class, and giving only my own mite of experience when I produced comb honey, I should be much pleased to hear through Gleanings the experience of others.

I repeat that, in order to produce comb honey from extracted at any profit, it must be done during hot weather while the bees are gathering nectar from the flowers; and the honey, before it is fed, must be thinned with boiling water to about the consistency of nectar. To feed thick extracted honey out of season to produce comb honey is a waste of both time and honey; and the small amount of comb honey that is produced is likely to granulate and become unsalable.

This is one of those leading subjects which should receive our attention until our markets are free from so much unsalable honey as we often see. With the knowledge and appliances for producing honey we now have, no man is excusable for putting a poor article on the market; and it is a duty we owe to ourselves and each other to condemn this practice wherever we see it. I cannot see how locality can make much difference in this matter; but I can readily see that, if honey is thinned to the consistency of nectar with boiling water, it will have a tendency to prevent its granulating; and if fed to bees in this condition during the season when it is natural for them to build comb and are gathering nectar from the flowers, a short slim harvest can be changed to a long rich one, for the bees will simply be helped to carry out their natural instinct, and success will be the result.

Delanson, N. Y.

POLLEN.

While an excess of pollen is undesirable, that some do honey to the friend points of is most prevalent bees are confined long periods on, and he comply of pollen disease. There that such is the out that wind-s Cornish penins disease than sh too, is, I believe of bees for long hives certainly The immunity the bees of No to the more ge constant flight fresh food.

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BEEES' EG

Many of your ested to learn t rearing may be post. Having, h enced bee-keeper will simply relate periment. When Taylor at Welwyr struck with his h and inwardly rec venient opportuni

POLLEN-CLOGGED COMBS.

While an excess of pollen in a hive is undesirable, it must not be forgotten that some pollen is as essential as honey to the bees' sustenance. A friend points out to me that foul brood is most prevalent in seasons when the bees are confined to their hives for long periods while breeding is going on, and he considers that a short supply of pollen predisposes the bees to disease. There is, I think, no doubt that such is the case. He also points out that wind-swept places such as the Cornish peninsula are more liable to disease than sheltered localities. This, too, is, I believe, a fact. Confinement of bees for long periods in our crowded hives certainly conduces to disease. The immunity from disease amongst the bees of North Africa may be due to the more genial climate permitting constant flight and the provision of fresh food.

On the other hand, my own opinion is that no germ can prevail against a perfectly healthy organism. The latter must be weakened from some cause before it succumbs to the invader. I have worked daily amongst disease in a London hospital, and never "caught" any complaint. Doctors or nurses seldom fall victims to infection.—W. J. Farmer in "B.B.J."

BEE'S EGGS BY POST.

Many of your readers may be interested to learn that eggs for queen-rearing may be successfully sent by post. Having, however, met experienced bee-keepers who doubt this, I will simply relate my eggs-by-post experiment. When visiting Mr. E. H. Taylor at Welwyn in the spring I was struck with his hybrid strain of bees, and inwardly resolved that at a convenient opportunity I would test the

"eggs-by-post" theory with this strain of bees. On July 10 I sent in a cardboard box two pieces of comb about an inch square, and asked Mr. Taylor to send a piece of comb the same size containing eggs from his best hybrid stock, and also a piece of comb with eggs from a Carniolan colony. I inserted these pieces of comb in apertures cut out to receive them in another comb, and set some bees to develop them. When the eggs were three or four days old I put them in queen-cell cups and gave to a colony busily engaged in queen-rasing. This same colony, by the way, had four different sorts of eggs in their cups. They rejected some of the eggs which came by post, as well as those of other kinds, but in the end succeeded in rearing two hybrid queens and two Carniolans out of those eggs which arrived by post from Welwyn. The queens referred to hatched on July 24, and to-day (August 5), eleven days old, two of the hybrids and one Carniolan have laid nearly a thousand eggs each. It appears to me that the "bee-egg" business is a much-neglected branch of apiculture, and I look forward to the day when advertisements such as "Settings of bee-eggs from a queen whose colony last year produced 100 sections and 25 lb. extracted honey" will become a regular feature in "B.B.J." advertisements.—J. Silver in "British Bee Journal."

Mrs. Barber's Honey-Cookies.—One large teacupful of honey. One egg broken into the cup the honey was measured in, then two large spoonfuls sour milk, and fill the cup with butter or good beef dripping. Put in one teaspoonful of soda and flour to make a soft dough. Bake in a moderate oven a light brown.

To Whom It May Concern.

Don't growl

Because the world is hard,
And has such very small regard
For what you are, or have, or
would—

If you are out for making good,
Don't growl.

Don't growl

Because some good things go
To other people that you know
Deserve them less than you do;
say,

If you want things to come your
way,

Don't growl.

Don't growl

Because the clouds hang low
With threatenings of wind and
snow,
And everything looks dark as
night—

If you expect to strike a light,
Don't growl.

Don't growl

Because you think that hope
Has struck a streak of yellow dope.
What if it has? What though at
last
All opportunity has passed,
And you lie down to rest, un-
crowned,
By adverse circumstances downed,
As often is the lot of man,
No epitaph is happier than:

"He never growled."
—William J. Lampton.

Editor Canadian Bee Journal:

Dear Sir,—Kindly say in C. B. J. that although my name appears as one of the revisers of the 1906 Report of Ontario Bee-keepers' convention, I do not wish any credit for the revising, because other duties prevented my taking any part in that work. Previous years I was able to spend considerable

time and work on the report as issued by the Government, but I left that all to Mr. Sibbald this year.

I am obliged to report another poor year for white honey, although the bees that survived the spring did better than a year ago.

Yours truly,
MORLEY PETTIT.

Aberfoyle, Aug. 26, 1907.

FALL CLEANING-UP.

The general tidying-up, so necessary about an apiary at this time of the year, will, of course, be left to the taste of the bee-keeper; some will be content to leave all sorts of odds and ends which have been in use during the summer lying about for months until the opening of the new year arouses them to activity again. We need scarcely say the appearance of a neglected apiary in winter is wretched in the extreme, and will be but a sorry inducement for an intending bee-

keeper to make while a few hours for and snugly surroundings is very pleasant; before urge one to when the hive is completely put in rubbish, weeds, will give an a "Record" (Briti

The annual of Simcoe Bee- be held in Barr 19th, 1907. All interested kindly tin, President, Secretary, New

For Sugar-c Meat.—8 pound honey, 2 ounces lons of water. solved, then pot



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keeper to make a start in apiculture, while a few hives of bees, well cared for and snugly housed, with all their surroundings in trim condition, is a very pleasant sight to see. We therefore urge one and all to set about it—when the hives themselves are completely put in order, to clear away all rubbish, weeds, and everything which will give an appearance of neglect.—“Record” (British).

The annual meeting of the County of Simcoe Bee-keepers' Association will be held in Barrie on Saturday, October 19th, 1907. All members and others interested kindly attend. James Martin, President, Hillsdale; Denis Nolan, Secretary, Newton Robinson.

For Sugar-curing 100 Pounds of Meat.—8 pounds of salt, 1 quart of honey, 2 ounces of saltpeter and 3 gallons of water. Mix, and boil until dissolved, then pour it hot on the meat.

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