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THE AUSTRALIAN Bee Bulletin.

A MONTHLY JOURNAL, DEVOTED TO BEE-KEEPING.

Published by E. TIPPER, West Maitland

Circulated in all the Australian Colonies, New Zealand, & Cape of Good Hope.

VOL. 19. No 6.

SEPTEMBER 30, 1910.

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"The Australian Bee Bulletin."

A Monthly Journal devoted to Beekeeping.

Circulated throughout the Commonwealth of Australia,—New Zealand & Cape of Good Hope.

Published by : E. TIPPER, West Maitland, N.S.W. Aus.

Editor: W. ABRAM, Beecroft

MAITLAND, N.S.W.—SEPT. 30, 1910.

EDITORIAL.

In this issue Mr. H. A. Geue advertises his Simplex Uncapper, and also gives a description of it. He informs me that complete letter patent has been granted him for his devise, which, according to description, seems to be simplicity itself, and the price is reduced to the small sum of £2 10s., so as to bring it into use by all beekeepers, and to increase the output. We would be pleased to hear from those having given it a fair trial.

From information received from different parts there is every reason to expect a big honey crop. The bees have come out strong and are breeding extensively. Beekeepers will do well to come to terms with each other now in order to obtain the most advantageous prices for their products.

Now, just as if the doctor had ordered it, there comes an invitation from Messrs. Hawken and Vance (vide their letter elsewhere) to make a small trial shipment of honey to England. This appears to be a fortunate circumstance, and if a number of beekeepers will send a case or two it ought to make a fair representation. By the time this season's honey will be harvested, we shall know the results of the trial shipment and also what kind of honey suits best for export. The only drawback at present seems to me to be this: that most beekeepers have

disposed of their stock and thus with the best of intention cannot participate.

The "A.B.B." is now offering the best available information appertaining to bee culture from European, American, and other bee journals, thus saving the readers not only the subscription, but also lots of **unimportant reading-mat**. This the Editor has to do, however, and a hard task it is, there being such a vast lot published. Carefully thought out practical articles are rarely met with, and scientific investigations are almost things of the past. What important and interesting problems Leuchart, Seibold, von Berlepsch, Dzierzon, von Planta, Cheshire, Langstroth, and many others undertook and solved?

The weather has been very changeable, a few days warm, then cold again; but as it is rather dry the bees are doing well. Fruit trees are in full bloom, and the orange blossom is opening out splendidly. Iron bark trees are coming into bloom shortly, and the black butt is one mass of buds. I have heard of some swarms being out, but the main fray will start with the beginning of the month. Be on the look-out and do not lose early swarms; they generally prove good honey-gatherers.

The demand for bees is very brisk.

EDITOR.

When you want Honey Labels send for Samples to the "Bee Bulletin" Office.

New South Wales and Commonwealth Beekeepers' Union.

A meeting of the Executive was held at Rawson's Place on the 26th inst. Mr. D. W. Parker sent an apology for non-attendance, and Mr. H. Lord was also absent.

Present; W. Abram, J. Rae, J. I. Parry, and J. J. Branch.

The minutes of last meeting were read and confirmed.

The Hon. Sec., Mr. J. Rae, Eastwood, then read the correspondence received from the several business firms he had written to regarding concessions on bee goods, honey tins, and the selling of honey. As these replies were not quite as expected, the Hon. Sec. saw the President a few days previous to the meeting, and it was arranged that both make a personal interview with the heads of these firms on Monday afternoon, and report to the meeting the results. As regards bee goods, one firm wished us to submit an approximate requirement, when the matter of concession would be considered on a liberal scale as possible. Another firm expressed willingly to allow the Executive a very fair discount, but under the stipulation that they should not sell the goods for less than their list of prices. Now, the Executive has no desire to benefit themselves but to assist members of the Union to obtain the benefit, if any. Thus there are now two ways open to beekeepers: either they make out a list of requirements and send it to the Hon. Sec., who, when he has a fair batch on hand, will present them to the firm, and ascertain the concessions; or if you send your orders to the Sec. the goods will be supplied you at schedule prices, but there is nothing to prevent the Executive from allowing a bonus of say 5 per cent. to members of the Union for any order of £1 or over. It will thus be seen that by passing your orders, especially for quantities; to the

Executive, you can easily gain your annual subscription to the Union, and more. It rests now with you to avail yourselves of the proposals made. If a number of beekeepers in each district would club their orders together, so much the better for them, as it would also save freight. Honey tins that do not leak can be supplied to similar advantage from the best known honey-tin makers. The sale of honey, however, is so far unsatisfactory, as practically no allowance is made by these firms, they stating that a charge of 5 per cent. is the lowest.

Messrs. Hawken and Vance's proposal to send a trial shipment of honey to England met with favour, as it will give beekeepers an opportunity to test that market again, and perhaps find an outlet for our supplies. In this instance it is suggested that as many as possible send a case or more each, so as to make a shipment of about 100 cases. The tins must be new and securely soldered, and the cases must have no marks which does not refer to honey. The honey must be pure, and particulars of gross and nett weight given in detail.

In former years beekeepers or agents had to approach London to take our honey, but in this instance they approach us. It behoves every beekeeper to assist in this matter to the best of his ability for the benefit of the industry.

It is a reminder that subscriptions to the Union are now due. Send postal note 5/- to Mr. J. Rae, Eastwood, who will send receipt by return post.

EDITOR.

SWARMING.

If a hive is full of brood, and densely crowded with bees, they make up their minds to swarm, and thus form a new colony. They begin to build queen cells on the side or under the combs, in which the queen deposits fertile eggs. In two

days the egg hatches into a larva, and these are fed by the bees on prepared food. And on the seventh or eighth day, when the cell is nearly filled with food, it is capped over. Then the queen in the hive will begin to feel uneasy, and almost cease laying. She knows the time is near for her to leave her home and lead a swarm. The bees themselves exhibit the same feeling, and many of the honey gatherers remain at home to join the swarm. On a warm day some of the bees commence running about excitedly, inside the hive and around the entrance, increasing rapidly in number; and in a few minutes all the bees intend to join the swarm, having first filled themselves with honey, they rush out in the air, cruising around the hive, and slowly approach a tree or shrub, which they settle on in one mass. This they do, partly to see if their queen is with them, and partly to prepare to continue their flight to a more suitable home. Sometimes the queen does not leave the hive with the swarm. Either she likes her old home too well, or, not being accustomed to fly, a sudden fear overtakes her at the last moment. In that case they return and swarm again the next fine day. In many instances the queen may not be able to fly far, being wing lame, &c., and may fall to the ground unnoticed by the bees, who will return as soon as they perceive their loss and wait for the hatching of young queens to swarm again.

The foregoing remarks apply to a first swarm, but a strong hive, in favourable weather, gives off one or more after-swarms. As soon as the swarm has settled, it should at once be caught in a hive or box and put in its place, because, if it is left any length of time it will probably start for a more suitable home, and thus be lost to the beekeeper.

E. E. ABRAM, Jun.,

Beecroft, N.S.W.

EXPORT OF HONEY.

95 Sussey-st., Sydney,
September 21, 1910.

The Editor "Bee Bulletin."

Dear Sir,—The Anglo Continental Produce Company, Ltd. of London, whom we represent in a large way for butter, and dairy produce generally, write to us under date 18th August, 1910, from London, as follows :—

"There is a very good market here for Australian honey, and we understand that you do largely in this trade. We shall be pleased to hear from you with quotations, and, if possible, a small consignment, as we have one or two customers who buy very large quantities of this article, and we have no doubt we can do the trade equal to anyone. A lot will depend upon the quantity we can procure as to whether it is worth while going into this and spending money over cables."

We presume it is the South Australian honey which is referred to above, but we think something should be done from this State, and we know these are the right people to do the business for us.

We have written them by return mail stating that we will see what can be done.

Our honey differs from South Australian honey and it is not much use trying to make sales straight out unless our honey is first known on the market.

We will be ready to give every assistance to any action which the beekeepers may take in New South Wales, and what we now suggest is that several apiarists co-operate and send a small portion of their output in one combined shipment. Each brand would be sold separately and account sales rendered, so that no consignor could lose much whilst the combined effort would make a decent shipment. If each apiarist consigns his quota to us with his full name and address and each quality branded,

we will arrange everything else, but we want it to be a big thing to make it worth everybody's while. We might mention that we have had shipments of butter worth up to £10,000 in one ship, shipped to the above people, so that we need not be afraid of overstocking them.

Yours truly,

HAWKEN & VANCE,

G. K. Hawken.

P.S.—If you had a complete list of all the apiarists we would circularise the lot as above.

Extracting without Using Bee Escapes or Cloth Honey-Strainers.

E. D. Townsend.

Lest some of my readers might conceive the impression that they were out-classed, on account of their having had so much experience along the line of extracted honey production, and the results described in this article could be secured only by those with a large experience, I will explain that the student, Mr. E. J. Smith, of Blanchard, Michigan, had probably not taken off so much honey before in his whole beekeeping experience, as he did in those four days of extracting; and, besides removing the honey from the hives (9,500 pounds), he worked one-half the time in the honey house.

My second son Arthur, twenty years old, who was brought up among the bees, did all of the uncapping of the honey. It will be seen from the above that two men with some experience in the production of extracted honey, and having the appliances that I have described to work with, ought to accomplish as much, or very nearly as much, as they did.

Ridding the Combs of Bees without removing them from the Hives.

We will follow Mr. Smith out in the yard and see how he managed to accomplish this result. The tools he makes

with him are a Daisy wheel-barrow, a well-lighted, 4-inch Bingham smoker, a hive-tool for prying the supers loose, a Coggshall bee-brush and a robber cloth. The latter article was used but little, as this system of management does not incite robbing. Queen excluders were used on this yard, so there was no brood to contend with in the upper stories to be extracted. Where queen excluders are used, the filled story is lifted up and the empty set of combs placed next the excluder; that is, whenever room is to be given.

With this system of working, the partly filled story, if any, and there usually is, is at the bottom, next to the excluder. The colonies to be extracted had on from one to two stories of surplus; the whole crop of clover honey for the season. The have explained in a former letter. The management is about as follows:

The wheel-barrow is placed in a convenient position near the hive, the cover of the hive removed, and the bees given a smoking that sends them down out of the top story of sealed honey. That is, the bees are smoked off the honey in the top story; then, as fast as nearly free of bees, the upper stories are lifted off and placed upon the wheel-barrow. There is no trouble in smoking bees from a story of all sealed honey, but where the trouble comes is in trying to get them from combs of unsealed honey. This is how he accomplished it:

The bees are smoked as usual, and many of them go down through the excluder, but quite a goodly number will stop for a load of honey when they come to the unsealed portion at the bottom, and, as we do not have time to wait for them to fill themselves, as time is too valuable at harvesting-time, the combs of honey are crowded over to one side, leaving a wide space next the side of the hive. Now, with a Coggshall brush we sweep the bees off from the side of the hive-body, and the side of the comb of

honey next the hive. Then the comb is slid over next the hive-side, leaving a wide opening between the first and second comb to be freed of bees. We then sweep the bees off from both of these combs on the side next the wide opening, and so on; clear across the super. A little smoke is blown over the combs as we proceed, being careful not to drive smoke clear down through the excluder, thus causing the bees below to stampede, and perhaps try to get back into the story we are freeing of bees.

The bees, once off the combs of honey, scamper down through the excluder, so there are only a few left on the combs when wheeled to the honey house. The number of bees carried into the honey house with this management, in harvesting the crop mentioned, amounted to about the quantity of two natural swarms

The Secret of Preventing Robbing at Extracting-Time.

The secret of preventing robbing when removing honey from the hives, and during extracting of the same, is to prevent a single bee from going home with a load of stolen honey. With no combs lifted from the hives in the yard-work, as explained above, there is no possible chance for robbers to get started at this part of the proceedings; hence, if they are tempted to rob, it must be from some cause directly traceable to the extracting house.

Don't let any Bees Escape from the Honey House.

For several years we have been in the habit of stopping up our honey house bee escapes during extracting time, then opening them after getting through, thus allowing the bees that were carried in to escape. This worked well as far as the extracting-time was concerned, but if there was a particle of a chance for robbers to get into the honey house, this practice seemed to encourage it. It was noticed that while no robbers would

seem to get into the extracting house during the extracting, soon after the escapes were opened, and bees had gone home loaded with honey, a terrible "to-do" would soon be on; and if there was a particle of a chance, robbers would find their way into the house. Sometimes the loss of mature bees by entering the honey house for "stolen sweets," after extracting was over, would be more than all we had carried in on the combs. Knowing this, no bees are allowed to escape from the honey house of their own volition, but, each night, or, better still, when through extracting at a yard, and the bees are clustered near each window, as at swarming time, the cluster is given a little smoke, then, with the Cogshall brush, the cluster is loosened and allowed to drop into a tin pail, or other receptacle, in which they are carried out into the yard and emptied near some colony weak in bees. Handled this way, the bees go home loaded with honey, but know nothing about where they got it. This is so late in the day that robbers will not work, and, by morning, things have quieted down to such an extent that extracting may go on without any interfering from robbers. While the plan of carrying out the bees each night will work very well, usually, I recommend the leaving of the bees in the extracting house until through extracting when possible.

But to return to the out door work: About two, well-filled stories make a wheelbarrow load, but, as we like to finish up a colony at the first opening of the hive, if it has three stories on they are usually all taken at a load. Caution: Wash all drips of honey from the wheelbarrow and brushes between each load, so that no robber will get a taste of honey, or you may have trouble.

The honey house work was divided between the workers as follows: Arthur did all the uncapping, Mr. Smith all of the outside work. As it took Mr. Smith

only half of the time to do the bringing in of the honey, the other half was occupied in turning the extractor, emptying the extractor, or weighing up honey, as the case required. As it did not take Arthur all of his time to do the uncapping, he, too, did the other work, as the case required.

The wheel-barrow stands about where it is stopped when the load of honey to be extracted is wheeled in. Some empty stories of combs are allowed to stand at the left of the one who does the uncapping, to set the full stories to be uncapped upon, to make them the right height for convenience in handling. As the combs are uncapped, they are hung in the end of the uncapping box next to the extractor, and remain there until extracted. Any drip from them goes into the uncapping tank. The cappings are kept well chopped up, so that the honey will drain out in good shape. The gate of the uncapping tank is worked open all the time, except when emptying the pail; and this is the only gate in the extracting house that requires watching.

The extractor is allowed to fill with honey until the reel begins to wade in the honey, when a 16-quart pailful is drawn off, and the gate closed until it is to be filled again.

The *modus operandi* of working the separating tank is as follows: With the separating float (previously described) in place, the tank is filled full of honey as it comes from the extractor. When pouring in the first two or three pails of honey from the extractor some particles of comb and impurities will go into the gate, so draw out half a pail or so, or until the honey appears clear, before beginning to can.

Only one or two cans of honey are drawn at a time, when the tank is again filled full. Handled in this way, with a 22-inch-deep tank and our separating float, honey is more free from particles of comb and impurities, than when

strained through cheese cloth in the usual way.

The separating feature seems to work automatically, for the faster it is worked the warmer is the honey, (animal heat) and the more rapid the separating of the impurities; consequently, the capacity is unlimited; or at any rate, it will handle all the honey that can be extracted with a 4-frame extractor, and do the work well.

Each night when through extracting, when the separating tank is still full of honey, remove the separating float, and skim the honey in the tank, and can it up, or that portion that is clear. Stop drawing when the scum begins to run through the gate, and what is left at the bottom of the tank goes with the next day's extracting.

The tank must be empty of cold honey when commencing the day's extracting, or the system will be a failure.

As the filled 60-pound cans accumulate, they are carried out of doors, then, at night, when through extracting for the day, a dray load is cased up ready for market.—"Beekeepers' Review."

EXPERIENCE WITH BEES.

Being an amateur I would like to relate a few of my experiences with bees.

Bees are one of the most interesting insects worthy of general attention. I have had some very trying experiences with bees.

One morning as I was busy catching swarms about the yard, another issued from a hive close by (I might here state that hardly one swarm out of a hundred that does not settle on some bush or shrub close by to the hive they came from. But once they get on the wing the second time they will go a long way before settling again). Well this swarm did not circle around like others, but flew straight over the trees due east, and as it was a fairly good

sized swarm, I gave chase. They flew fast and high for about a mile, and I had a very hard job to keep them in sight; but after awhile they came into a scrubby patch and flew lower, so I followed them very easily then. They did no go much further after that, but started circling around a small sapling, and I stood watching them, thinking they would settle close by on some shrub or tree; but to my surprise, they began to circle around me and settle on my arm, so I held my arm out and stood quite still, and in about a quarter of an hour they had all settled on my arm, and then I walked homewards. But the trouble was they began to crawl up my arm and sting me (It was not too pleasant, I can tell you; many a time I felt like shaking the swarm off). Well, to stop the bees from crawling up to my shoulder and around my back, I held my left hand over my right arm just below the shoulder; but I squeezed some bees and got a few more stings. At last I arrived home. I then shook the swarm into a swarm box, and my arm was covered with stings. But after all my trouble I got the swarm neatly hived, and, strange to say, it turned out to be one of the strongest and best honey gatherers.

Another experience I had with a swarm is never to put a newly-issued swarm into a hive with newly-extracted frames that are very sticky.

Well this happened to me some little time ago. A swarm came out very early, about half-past eight, and settled close by on a small shrub, so I caught it in the swarm box and left it till I had prepared a hive. I went into the honey room and brought 10 frames from which the honey had been extracted. I put the frames into the hive and began to hive the swarm, when lo; shortly afterwards they all rushed out of the entrance and back to the shrub they had settled on

in the first instance. I went and caught them again and put them into the hive once more, but they came out again as before; and this happened about four times, and they were very scotty by this time, because of the meddling I gave them. So at last I left them in the swarm box till my father came home. But when my father came home he gave me a good rousing for being such a fool as to try and hive a swarm on extracted combs. Well, I could relate my experiences here for hours, but the foregoing indications may help others to relate some of their experiences.

E. ABRAM, Jun.,

Beefarm, Beecroft.

SHALLOW EXTRACTING COMBS.

A subscriber asks if there are any advantages in shallow supers after the weather has become warm, as in summer. He asks, especially, if the bees will fill two, half-depth supers any sooner than one full-depth super. I doubt it. There is undoubtedly some advantage in shallow supers at the opening of the season, but when the colony has become very populous, the weather warm, and the honey flow good, I can see no advantage in the shallow super.

This same subscriber asks about the use of artificial heat in the spring to secure the drawing out of foundation as recommended by Simmins. I have never tried it, but I believe that all attempts at the use of artificial heat, in the spring, in this country, have resulted in failure. Early in the season it is best to make haste slowly.

When you want Honey Labels send for

Samples to the "Bee Bulletin" Office

HONEY.—

Supplies are arriving fairly well, but the demand is only for choice quality, which is selling at 3½d. and occasionally 3¼d. Medium quality liquid is slow of sale at 2¾d. to 3d. per lb., and candied is dull at 2¼d. to 2½d.

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IS IT THAT NEW BEE DISEASE ?**Something that Attacks Adult Bees in a Peculiar Way.**

BY B. I. GILMAN.

I am in trouble, and very much in need of your advice. I have about 25 colonies of bees in two apiaries. These bees went into the winter in very fine condition. Every colony was very strong in young bees, with plenty of honey. A light honey-flow the last of September enabled the bees to store as many as three combs of honey to each hive. They had quite a lot of pollen, also. The bees wintered splendidly. I looked over the apiary in February, and all seemed strong; but I noticed that the honey gathered in September had not been capped. I could not see that they had used any of it. It was all granulated. I did not examine the sealed stores any more than to notice that they were using them up; about March 1st I noticed flies at the entrance of some stands. I examined at once, and found the bees dwindled to a handful. In some cases the bees were gone, leaving frames of honey. I examined every thing and found the honey granulated—no pollen. In colonies that appeared not to be affected I found them building up nicely—brood, but no pollen.

After our experience of last year of a pollen famine and starved brood, which we quickly corrected after reading "Gleanings," entitled "Pollen Famine," we commenced to feed equal parts of first-class cotton-seed meal and flour, which the bees took readily for about ten days, when natural pollen began to come in. The bees, however, continued to die, and in some cases they left brood in all stages (eggs to hatching brood). The bees have diarrhea or dysentery—the alighting-board shows it.

We have been reading Dr. Miller's article, Nov. 1, p. 664, "Diseases of Mature

Bees;" also the article that follows, "Animal Parasites as a Cause of Bee Diseases." We are fearful that this disease may be *Nosema Apis* in some form, although the voidings are bright yellow, coarse, and very copious. There does not seem to be any distension of body or bowels in dead bees. The frames of the affected colonies are not "messed up" at all, excepting where robbers have worked on the granulated honey; and even there, there is no sign of voidings. We find no dead bees around the hives nor in them, excepting in two or three hives where the bees seem to have starved to death from want of food—our neglect; and even in there, no sign of evacuations on the alighting-boards or inside the hive. The disease seems to have "let up" in one apiary where the loss was about 10 colonies in 150—a big loss for Southwest Texas. But at the home apiary they are still dying, but not so bad, however; and many affected colonies are building up nicely. In no case have we found a queenless colony.

The strongest colony in the home apiary, and one of the very few that have not been affected with this dysentery, has a golden Italian queen. This looks as though the golden queen were more immune than black or hybrid.

I will add that there are no apiaries within six miles of us; that some apiaries near Uvalde and Batesville are having heavy losses, probably from the same cause.

[We have compared all the symptoms of the disease mentioned by Dr. Miller and Friedman Greiner, on pages 664 and 665 of "Gleanings" for last year. There are several things that suggest that it might be *Nosema apis*; although the voidings reported by you are yellow, you will notice in the articles referred to it speaks of the contents of the middle bowel being white. We do not know whether, in the downward passage, the

contents become yellow or not. As it is, we are referring this to Dr. E. F. Phillips, of the Bureau of Entomology, and suggest that you send him at once bees that have died from this peculiar disease, and also a slat of wood or something showing the character and colour of the voidings.

We would suggest that the affected colonies be put into a quarantine yard where there are no other bees, for we judge it would be dangerous to leave these bees that are affected in a yard where there are perfectly normal bees.

We can hardly think that the trouble can be due to pollen famine. While the lack of nitrogenous food affects the development of brood, it does not in any wise have any effect, direct or indirect, on adult bees. The fact that you notice that the bees are dying off in such large numbers shows that it is a form of dysentery; but as we have had such mild weather, if it is the old-fashioned kind we would naturally expect its ravages to let up after the bees get to flying. We should be pleased to know whether any of our subscribers have seen any thing like it.—ED "Gleanings."

CHEMICAL COMPOSITION OF HAWAIIAN HONEYS.

By W. P. Kelly.

For many years the chemical composition of most products of commerce has, in a general way, been known. In the manufacture of some of these the entire process is subject to the strictest control, and the finished product came to conform very closely to a given analysis. Included in the list of substances coming thus under chemical control may be mentioned various food substances, although their chemical composition formerly received only a general study. In recent years, however, the chemical composition of foods has been more thoroughly investigated. It is a strange fact

that while, for many years, certain articles of commerce received the attention of expert analysts, a large percentage of the substances that go to form human food were not so carefully investigated. The farmer, for instance, is much concerned about the composition of the fertilizers which he applies to his fields, and often quite exacting in his demands; but the articles of food that he purchases are consumed with little inquiry as to their makeup. The average American has not taken the trouble to inquire into this question, and in this connection it may be stated that, at least until recently we as a nation were far behind the more progressive European countries in regard to this point. A general awakening of the public conscience to a more intelligent inquiry concerning the purity of the substances of food, however, has led to a more diligent and careful study of their chemistry. Our Bureau of Chemistry of the Department of Agriculture, led by the efficient direction of Dr. H. W. Wiley, has devoted no small part of its attention to this subject, and, as a result, the American consumer is becoming better acquainted with the composition of his food stuffs.

Among the food products that have received such attention may be mentioned honey, although its composition has, in a general way, been known for many years. In bulletin No. 110, of the Bureau of Chemistry, is shown the chemical composition of honeys derived from a wide range of sources; likewise the subject of Hawaiian honey was recently set forth in Bulletin No. 17 of the Hawaii Experiment Station. From these and other investigations it is evident that the source from which honey is derived determines in a considerable measure its chemical composition. The differences between the composition of nectar honey, such as white-clover honey, alfalfa honey, and algaroba honey, are slight, being princi-

pally those of colour, aroma, and flavor; but the composition of honey-dew honey is strikingly different.

There are small variations in the composition of the same type of honey, as is shown by analysis of samples drawn from different places. This is due, in the main, to the fact that the honey-*bee* does not confine itself wholly to any one source of nectar, and, therefore, the average honey is a blend of various nectars, and also usually contains some honey-dew. As an average of many analysis, however, white-clover honey has been found to contain the following percentage composition: Moisture, 17.6 per cent.; reducing sugar, 71.75 per cent.; sucrose, 1.75 per cent.; ash, .07 per cent.; dextrine, .80 per cent.; and free acid, .06 per cent.

Honey derived from the nectar of alfalfa contains 16.50 per cent moisture; 73.60 per cent. reducing sugar; 4.4 per cent. sucrose; .07 per cent. ash; .34 per cent. dextrine, and .08 per cent. free acid. The famous algaroba honey, which is produced in such abundance in Hawaii, as been found to contain 17.1 per cent. moisture; 80.3 per cent. reducing sugar; 2 per cent. sucrose; .44 per cent. ash; 3.57 per cent. dextrine, and .1 per cent. of free acid. The above analysis are for nectar honeys. We will now consider the honey-dew type, which is produced so extensively in Hawaii. This as been found to contain about 15.5 per cent. moisture; 62.1 reducing sugar; 5.25 per cent. sucrose; 1.3 per cent. ash; 10 per cent. dextrine, and .15 per cent. free acid. From the comparison of the above figures, it is apparent that honey-dew honey is quite unlike nectar honeys in chemical composition, containing considerably less reducing sugar, and very much more ash, dextrine, and sucrose.

There are, however, still greater differences between nectar honeys and honey-dew honeys than are shown by

the above analyses. When polarized light passes through a solution of nectar honey at a temperature of 20 degrees it is usually rotated to the left, while honey-dew honey rotates the plane of polarized light to the right. After nectar honey undergoes "inversion," as it is called in chemistry, rays of polarized light passing through its solution are again rotated to the left at a temperature of 20 degrees; while honey-dew honey, on the other hand, continues to rotate to the right after inversion. Right-handed polarization in honey has long been regarded as evidence of adulteration with commercial glucose or sucrose; but in the case of honey-dew honey this explanation will not hold for its right-hand polarization, since samples of known origin, and those free from adulteration, possess this characteristic quality. Its explanation is found in the high percentage of dextrine and other gummy-like bodies which are always found in honey-dew honey.

Notwithstanding the material difference in chemical composition between honey-dew honey and nectar honey, both are natural products, collected and stored by the honey-*bee*, and as such are free from adulteration in the usual sense of the word, and may, therefore, be used without fear of their containing commercial glucose or other added sugars.

Algaroba is the source of one of the most beautiful honeys on the market. It is almost white in colour, and possesses a very delightful flavour and aroma; and, although it is but little used for table purposes, since practically all Hawaiian honey is sold to the baking trade, it has but few equals and no superiors as a table honey. Honey-dew honey, on the other hand, is a dark viscid substance, and is wholly unlike other honeys in flavour, etc. It is entirely used in the baking and confec-

tionery trade, where it is highly prized, since it possesses baking and boiling qualities superior to that of other honeys. By far the greater part of Hawaiian honey is neither algaroba nor honey-dew honey, but it is a natural blend of the two. In fact, there is no distinct division between the two types, each merging imperceptibly into the other. It has been recently decided by the Pure-food Board that honey-dew honey may be sold under the pure-food and drug act by being labelled "honey-dew honey," and since it possesses such exceptional baking qualities, and is not brought in competition with table honeys, in so far as table use is concerned, it is quite certain that the demand for the product will continue to increase, and especially since it is now a well-established fact that honey-dew honey does not contain commercial glucose or other added sugars.

MIGRATORY BEEKEEPING ON A LARGE SCALE.

A Brief Mention of Some of the Difficulties Encountered when Moving Four Wagon-Loads of Bees with a Traction Engine.

BY R. F. HOLTERMANN.

Migratory beekeeping, moving bees to various pastures, is, in Europe, a much more common practice than in America. In Europe, so far as I know, the main object in moving bees—aside from moving as a result of changing owners—is to give the bees the advantage of the heather and buckwheat bloom. In the United States, in addition to the objects given above, some have in view moves north and south, for considerable distances, to prolong the honey season.

My first move to bee pastures was some thirteen years ago; and since that, almost every season I have moved some-

times to clover, sometimes to basswood, and sometimes to buckwheat. During these years I have moved many and many a wagonload of bees, many a carload, and also boatloads including a tug and scow, boats propelled by gasoline-engine power and by the wind. This season there has been added to my experience, moving by means of a traction engine.

The most anxious moments of my beekeeping experience have been spent in moving bees, and I have no doubt whatever that these have resulted in many a grey hair being added to my head. And let me say here, that, unless undertaken in a very small way so that the responsibility and labour are greatly lessened, the chief point to consider is whether the beekeeper is rightly constituted to bring this work to a successful issue. If he is to surmount the obstacles which lie inevitably in the path from time to time, he must be willing to throw into the work the best his body and mind can produce for the time being. Unless on a small scale this work must, of necessity, be laid out considerably ahead of time, and must, therefore, be carried out regardless of weather and other conditions, at the time set. For instance, if four or five teams are ordered for a certain night (we always try in summer to move at night), farmers often have to make special preparations such as putting hay-racks with straw on their wagon, greasing wagons, shoeing the farm horses in preparation for a long and unaccustomed road trip, etc. These farmers and the beekeeper perhaps can not readily communicate with one another. This makes it imperative that all go, rain or shine, hot or cold. If the trip is made by train or boat the same holds good with the added responsibility of having teams ordered at the other end of the trip. If by boat, owing to the danger of storms, the risk is even greater; and with the danger of having a sail boat, by reason of contrary winds or a calm, left on the water

during the heat of the day with the sun to beat down into the boat, the risk is incalculable. Although I have come safely through every experience, the sail boat for transporting bees is a thing of the past with me. I have seen enough to feel its danger.

In the first carload of bees I shipped I lost forty colonies out of 340; since that, so far as I can recollect, I have lost none by his method of shipping. Thirty-six-foot cattle cars are used. To give the bees air I have used my own invention, a portico to the hive with the sides slightly projecting on the inner side a groove is cut into which a screen can be quickly slipped preventing egress on the part of the bees. The hive entrance is the full width of the hive with a depth of 1½ inches, and the portico leaves 2½ inches between the screen and the front of the hive. All the ventilation the bees get during a move is through this screen. My experience would lead me to urge that the bees be frequently sprinkled with water when in transit—the colder the water the better. To spray water all over the hives and the car is also an advantage. The evaporation which follows lowers the temperature. We watch the bees, and when they run about in the portico like a drove of sheep, manifesting excitement, and with their tongues protruding through the screen, we know that there is danger.

In moving bees I avoid using hives where the brood-chambers consist of combs newly built, preference being given to combs wired and toughened by cocoons. If the brood-combs are not heavy with honey and brood, so much the better; but to this latter I pay no attention, simply taking conditions as they are.

During the past summer, having to move bees some forty miles I consulted with the owner of a traction engine, explaining to him that we should have both clay and sand road; and after his asser-

tion that he could draw the load I decided to give the plan a trial.

Some 110 twelve-frame hives with one or two supers on each were loaded on four wagons with racks filled with straw. The engine had also a water-tank, and upon this tank a platform with 1500 lbs. of coal. The bees were loaded, after being interrupted by a thunderstorm which promised much, but let us off with only a slight shower.

About 10 p.m. we moved off at a pace of about 4½ miles an hour. Every one felt that matters were working very smoothly. The party consisted of Mr. Shurr, the engineer and owner, standing on the engine step at the right hand of the engraving—a man who showed himself a master hand at his work, as we did not have to uncouple our long train even once to turn corners. By his side is Mr. Shurr's assistant. With the bees were Walter Ebert, with whose father I had the bees; next, Louis Held; and on the last wagon, Charles Hatton, of Ohio, whom I had met at the National convention in Detroit, and who spent some time with me to gain greater experience in the production of extracted honey. He said he shone in a long day's work, and he had his opportunity, as it proved.

Our splendid start did not let me forget that there might be danger ahead, as there had apparently been a heavy thunderstorm, and frequent long trips had given me experience as to variations in rainfall in a section of country; and I knew how slippery clay roads under certain conditions might be. I used to be an advocate of wide-tired wagons until one night, moving bees on slippery roads, we had such wheels on one wagon, the rest being narrow. I followed that wagon on foot for six miles until we passed the clay, and again and again the rear slewed around until at right angles to the road, with every prospect of upsetting unless the driver followed the movement with his horses and the front wheels.

From that night to this day I have felt that the advocates of legislation to compel the use of wide tires did not know their business.

The clay roads became more sticky; and, before we knew it, two wagons were almost over a steep bank. With chains to the rack of the wagon, and to a fence post on the other side, we relieved the pressure on the slowly sinking wheel on the other side of the load. A portion of the bees had to be unloaded. Such situations caused delay; and after a time, owing to frequent stops our water and fuel ran out. The former, owing to a long spell of dry weather, was difficult to get. However, we reached the gravel at last, and our spirits rose; and as we made good time these feelings gave vent through the steam whistle, as, in the engineer's estimation, worthy objects of salutation were passed on the road.

We thought our difficulties had been surmounted as we passed, like a triumphal procession, through Port Dover. The summer tourists were snapshotting the procession from every direction, thinking, as one expressed it to me, such a scene did not often present itself to the photographer. But when we came to the sand we found it too loose for the engine wheels to secure a purchase. Here the engineer had reckoned without his host. It would take too much time to describe the troubles we encountered—the broken cable (for each wagon drew from one cable, thus preventing the strain from the rear wagons having to be borne by the preceding), hunts for water for bees and engine, etc. We had a splendid band of workers who made the most of every situation and opportunity. At the most critical time Messrs. E. Trinder, President of the Norfolk Beekeepers' Association, and Jas. Armstrong, foul brood inspector for the district, came along.

Seeing the straits we were in, Mr. Trinder gave us wood and water, refusing any pay. Mrs. Trinder prepared

food for the party on the same terms, and then the above-named gentlemen went ahead and arranged to put the bees at a nearer point, where they were placed by an exhausted party almost twenty-four hours after they were loaded. We all made a solemn resolution never again to move bees; but **within a few days** had another night trip moving bees over the same road by wagon, followed by the shipment of a carload, and then four wagonloads the following week.

Any one moving bees should weigh well the cost, lay well his plans, judge well the chances as to honey, and not only be alert as to everything going on, but carry the responsibility of the work and set the pace for his help. This means that some will have to carry a load that they are not able to bear. Others may refuse to work so hard, and in this they may have a wisdom superior to the one who practices migratory beekeeping.

Experience has taught me that every teamster should be continually watched until he has proven himself a careful, thoughtful, and capable man.—“Gleanings.”

The Relation of the Etiology (Cause) of of Bee Diseases to the Treatment.

BY G. F. WHITE, Ph. D.,
Expert in Bacteriology.

Introduction.

Beekeeping is not an industry which brings a fortune to a few, but is one the profits of which add comfort to 700,000 homes in America. This industry, which is a pleasure and a profit to so many, is beset with difficulties. One of the greatest obstacles encountered in the successful pursuit of beekeeping is disease. There are a number of diseases which attack the honey bee. Those which cause the greatest loss attack the brood. These diseases are known to the beekeeper as American foul brood, European foul

brood, and pickled brood. Considerable loss is sustained also from paralysis and dysentery. Other disorders of less importance are sometimes encountered. If the apiarist is to treat these diseases effectively, he should become as familiar as possible with their etiology. Therefore this opportunity has been chosen to discuss the causes of bee diseases, as far as they are known, and to emphasize the importance of such knowledge in the treatment.

The word "disease" is made up of two parts, "dis," referring to a negative condition, and "ease," meaning a state of rest. By combining the parts we have the very appropriate word meaning a negative state of rest. We are all familiar with health, which is the state of rest. It is the condition which we experience when all the organs of the body are, so to speak, in a state of equilibrium. Any departure from this state of health is disease. You should remember that disease is alike in nature in all the animal kingdom and differs only in kind.

To understand best the nature of disease we must study the causes of disease. A number of factors may combine and be responsible for a diseased condition. This group of factors is known as the "etiology." Etiology, then, means the causation of disease. Let us further consider the etiology of disease and use bee diseases largely as illustrations.

Etiology (Cause) of Diseases.

Every abnormal condition in the body of an animal which we know as disease has a cause which has brought about such a condition. In most of the diseases of man and the higher animals comparatively little known of the cause. Likewise, and unfortunately, the same is true of bee diseases. Gradually but slowly new facts about all diseases are added to our knowledge, the unfortunate thing being that so many statements are reported as facts which have never been demonstrated to be true.

In the study of the etiology of a disease and in the discussion of it, it is convenient to divide the causal factors into predisposing and exciting. Under the predisposing causes which may be considered as factors in bee diseases we have age, sex, race, heredity, climate, and preexisting disease. Under the exciting causes we may consider food and micro-organisms.

To illustrate, let us consider the different factors just mentioned.

PREDISPOSING CAUSES.

Age.

In our experience with human disease we have learned to expect scarlet fever, measles, mumps, and whooping cough more often in children than in adults; typhoid fever and appendicitis in young adults; and cancer in those more advanced in life. In bee diseases we expect European foul brood to attack larvae that are younger than those which suffer from American foul brood. We expect the so-called "pickled brood" to die just before or after capping, while paralysis is, as far as we know, a disease of adult life.

Sex.

Of some importance in the etiology of human diseases is the factor sex. Inflammatory rheumatism, gout, and diabetes, for example, occur more frequently in men, while goiter and hysteria are more frequent in women. In bee diseases we expect in American foul brood to find the worker larvae more often attacked than the drone, while in European foul brood this difference, if it exists, does so only to a slight degree.

Heredity.

You are all familiar with the fact that heredity is considered as an important predisposing factor in tuberculosis, cancer, gout, insanity, etc. It is interesting that in the so-called "pickled brood" there is some evidence which indicates that heredity plays an important role.

Race.

Racial immunity is a rather interesting factor in the study of human and animal diseases. The negro, for example, seems to possess considerable immunity in gout and diabetes compared with the white race. Sheep ordinarily are very susceptible to anthrax, but there is an Algerian race of sheep which is immune to this disease. Some beekeepers believe that race is an important factor in bee diseases, but comparatively little is definitely known on this phase of the etiology.

Climate.

That human diseases are more frequent in some climates than in others is a fact familiar to us all; that climatic conditions play a part in bee diseases seems to be quite probable.

Preexisting Disease.

Preexisting disease has very little, if anything, to do with bee diseases. By preexisting disease we mean that when an individual passes through an attack of a disease predisposes that individual to other diseases. This is illustrated in various human and animal diseases. In bee diseases we do not know whether any larva or pupa ever recovers sufficiently from an attack of disease to continue its development and emerge as an adult bee. Many beekeepers think that adult bees in American foul brood colonies are less active than in normal colonies. Whether or not they suffer from disease we do not know. It is possible, but not so probable, that they have suffered a light attack of disease while in the developmental stage and emerged as adult bees with weakened organs which do not perform a normal function. If this were true, it would illustrate the importance of preexisting disease as a predisposing factor in etiology.

Having thus briefly considered some of the more important predisposing causes which enter into the etiology of bee diseases, let us consider two of the more

important exciting causes—food and micro-organisms.

EXCITING CAUSES.

Food.

The character of food is believed by many beekeepers to be an exciting factor in dysentery. Should the food contain poisons, grave results might follow. Some attribute paralysis to the character of the food, but this is far from a demonstrated fact.

Micro organisms.

By micro-organisms we mean those living plants and animals which are very small and must be magnified greatly before they can be seen. Those which are to receive our attention are bacteria, protozoa, and fungi.

BACTERIA.—We have now come to the consideration of that factor in the etiology of bee diseases which is most important and with which we would have the beekeepers become familiar. The annual loss sustained by the beekeepers of this country due to the one cause, bacteria, is to be reckoned in millions. It is unfortunate that it is necessary to use the word bacteria, because too many at once think that they are not able to understand anything about bacteria. This is a mistaken idea. It is not difficult to understand the facts about them which are most important in the treatment of disease. It might be well to review here some of the things known concerning their life history.

Nearly two years ago the writer had the honour of reading a paper at a meeting of bee inspectors held at San Antonio, Tex., upon the subject of the bacteriology of bee diseases. This paper appears in Bulletin No. 70 of the Bureau of Entomology of the United States Department of Agriculture, page 10. In it are discussed briefly the nature of bacteria, their distribution, the methods of studying them, and the results of their activity. It is stated that bacteria—often called germs, microbes, and para-

sites—are very small plants; so small, indeed, that 12,000 placed end to end measure but 1 inch. They increase in number with marvellous rapidity. Under favourable conditions each bacterium in twenty minutes becomes two. At this rate countless millions are formed in twenty-four hours. As the soil becomes exhausted in which they are growing many species form spores which are in a way comparable to the seeds of higher plants. These spores are very difficult to destroy by heat and other disinfectants. It is well to remember, concerning the distribution of bacteria, that they are found in very large numbers everywhere about us, but most of them are as harmless as the vegetables we eat. But should there be introduced into an apiary, for example, the species of bacteria which causes American foul brood, then the brood becomes exposed to the disease and will probably contract it.

The study of bacteria must be carried on for the most part in the laboratory. By the use of the microscope we are able to tell the genus (e. g. *Bacillus*) to which an organism belongs, and by specially prepared media, or soils, we are able to determine the species to which it belongs (e. g., *alvei*).

Having determined these things about bacteria, we are interested in finding out what they are capable of doing. We learn that some do good, as, for example, in bringing to decay the remains of dead animals and plants, while other species do harm by their ability to produce disease or death in the animals in which they are able to gain entrance. The disease American foul brood, which causes the greatest loss to the beekeeping industry, has been demonstrated to be caused by bacteria. Above all, you should understand that the death of the brood is due to one species of bacteria growing in the larvae.

PROTOZOA.—In contrast to bacteria, the protozoa belong to the animal king-

dom. They are very small unicellular animals. Many species are harmless, as are many species of bacteria, while some species have the power to produce disease. They produce disease and death in a manner very similar to bacteria; that is, by growing in a body of a living animal. As far as we know, none of the bee diseases is due to protozoa. One investigator described what he thought was a protozoon and named it *Spirochoeta apis*. It was shown that he made an error in his observations. Therefore, there is no *Spirochoeta apis* and no protozoon, as far as we know, which is pathogenic to bees.

FUNGI.—The term "fungi" is a rather broad one, but in the diseases of animals we usually refer, in speaking of fungi, to those forms of plant life which are higher than bacteria. They are usually made up of branching mycelial threads, and have a variety of methods for producing spores. One writer described one species, *Aspergillus pollini*, which he was supposed to have proved to be the cause of pickled brood, but he had not done so.

To the above groups belong the known exciting causes. There are also unknown exciting causes. When the unknown causes become known they may be found to belong to the groups mentioned above,

There is a very important classification of diseases into those which are infectious and those which are noninfectious. From what has been said, this classification becomes clear to us. An infectious bee disease is one which may be transmitted from one colony to another through the natural processes in the apiary. American foul brood and European foul brood are examples of this class of disease. What is transmitted in an infectious disease? It is the exciting cause of that disease. In American foul brood it is one species of bacteria, *Bacillus larvae*. In European foul brood we do not know what is transmitted. Since we do not know the exciting cause it must be classed under the

unknown exciting causes. When the cause is determined it will probably be found to belong to one of the three groups of micro-organisms mentioned under the known causes. A noninfectious disease is one which is not transmitted from one colony to another. The so-called "pickled brood" and paralysis, as far as we know, illustrate this class of diseases.

This brief discussion of the etiology of disease is given in order that you may get a clearer idea of the nature of the disease and what is meant by etiology. We shall now consider the treatment of disease and illustrate with bee diseases.

Treatment of Disease.

The ultimate object in the investigation of diseases is the successful treatment of them. Before a disease can be treated rationally the diagnosis must be made; in other words, it must be determined what disease is present. If, for example, the so-called "pickled brood" is present in an apiary, the treatment will be quite different from what it would be if American foul brood or European foul brood were present; and if no disease is present, as sometimes happens, and the beekeeper suspects a disease, it is important that a positive diagnosis be made of this condition.

There is no method by which bee disease can be so positively diagnosed as by the finding of the exciting cause in the affected and dead bees. The fact is made use of in diagnosing samples of brood sent to the laboratory and illustrates one important advantage in knowing the etiology of disease. If we are to devise methods for treatment it is important that we should know where the exciting cause exists, under what conditions it grows, how it is carried from one place to another, and how it may be destroyed. These facts are determined by a study of the etiology of the disease and it is upon such facts that we should base the treatment.

Those who are familiar with bee diseases are also familiar with the different methods of treatment. It is not the purpose of the writer to discuss any of the classical methods, but to suggest a few of the principles upon which such methods must be based if they are to be most effective. Treatment is both preventive and curative.

(To be continued.)

Rendering Old Combs Into Wax, with Great Ease, Speed and Perfection.

W. Z. Hutchinson.

Mr. W. J. Manley, of Sandusky, Michigan, has perfected a method of wax making that deserves the above title. I visited him recently, and watched the *modus operandi*, then made a photograph of the paraphernalia.

The characteristic features of the plan are that of pressing only a small amount of material at one time, doing it very thoroughly, yet with such a system that one batch can follow another in rapid succession, pressing the slum gum under water that is boiling hot; releasing and re-applying the pressure, *a la* Hershisser; getting the wax up on top of the water, away from the slum gum and the burlap packing; then pouring the wax and hot water off into a cooling tank, and, last, but not least, drawing off the hot water from under the wax, in the cooling tank, and using this hot water over again for melting the next batch, thus saving the heating of another boiler of water.

First, let's describe the implements, or utensils. For heating the water he uses a common, six-griddle, cook-stove, with a reservoir. The old combs are melted in two, common wash boilers. The one thing that must be built with the greatest care is the press. He first tried presses sent out by manufacturers, only to meet with disappointment. They couldn't "stand the pressure." The outside jacket

is 15 inches in diameter, 18 inches deep, and made of heavy, galvanised iron. Around the top, inside of the can, bolted, very solidly, an iron hoop an inch and a half wide, and $\frac{1}{4}$ inch thick. Bolted to opposite sides of the can, at its upper edge, the bolts passing through the iron hoop just mentioned, are two strips of iron, $\frac{3}{8}$ thick, about 4 inches long, having one end turned outwards and formed into a hook that will receive a bolt $\frac{5}{8}$ of an inch in diameter. The cross-piece, above the can, through which passes the screw, is about four inches wide, and two and one-half inches thick, of hard wood, and reinforced by a piece of wagon tire iron half an inch thick and as wide as the piece of wood. Mr. Manley says that only the man who has been through the mill can realise the necessity for making everything very strong. The pressure that can be exerted with a screw is something tremendous. In each end of the cross-piece is a $\frac{5}{8}$ bolt with a heavy nut on the lower end. When the cross-piece is put in place and swung around in the right direction, these bolts slip into the hooks already mentioned, the nuts catching below the hooks and holding down the cross-piece.

The next most important feature of the press is what Mr. Manley calls a "spider," which is put in an inch or two from the bottom of the can. The name is very appropriate, as it certainly resembles a huge spider with its legs fastened to the sides of the can. It is made of pieces of iron about 3-16 thick and one inch wide, bolted together at the centre, and the ends bolted to an iron hoop that just fits inside the can and is bolted to its sides. This iron hoop is of the same size and weight as the one at the top of the can. Don't think that it will answer to rivet these hoops to the can. It won't. They will pull off. Use bolts with washers on the outside, and have the washers thoroughly fastened to

the can with solder. Even when all this care has been taken. Mr. Manley says that the screw-power must be used with discretion.

Fastened to the bottom of the screw is a plunger, or follower, made of heavy cast iron, and reinforced on the lower side with two layers of bars of wood; these layers crossing each other at right angles. Aside from the added strength, there is an advantage in having two layers of bars crossing each other. If the slum gum in its covering of burlap is forced up between the bars of the lower tier, there are still openings in the upper tier through which the wax can escape.

Perhaps half an inch less in diameter than the can, is an inner basket of perforated iron. Inside of this basket is used a sack of burlap for holding the slum gum. This, I believe, completes the description of the press, and I think I now better go back and tell how the wax is melted and pressed, and bring the process up to the point where the wax leaves the press, before going further with any description.

First, the combs are all cut out of the frames, and the frames scraped clean, before any wax rendering operations are begun. After steam is up, and work begun, there is no time for cutting out combs. They are all cut out and thrown in a huge pile in one corner of the room, from whence they can be readily scooped up with a shovel and thrown into the boilers as needed. We will suppose that the combs are cut out, a good fire in the stove, and the two boilers and the reservoir full of hot water. The equivalent of about eight Langstroth combs is put into the boiler that sits upon the hottest part of the stove. As the combs melt they are stirred and thoroughly broken up with a large stick. When the wax has thoroughly melted, the perforated metal basket is set inside the press, the burlap sack hung inside the basket, and the contents of the boiler dipped with a

gallon dipper into the burlap sack. That is, it is dipped at first, until the operator is able to pick up the boiler and pour out is able to pick up the boiler and pour out the rest of its contents into the burlap sack. After the melted combs and hot water are all in the press, the burlap sack is grasped with both hands, at its upper edge, lifted up somewhat, and twisted about, until the bulk of its contents has been reduced so that the top of the sack can be folded down upon the body of the sack. The screw and follower is then put in place and screwed down upon the sack. While this batch is pressing, the other boiler is filled with combs and set to melting upon the stove. The screw is then loosened, and the water allowed to enter the slum gum, when pressure is again applied, a la Hershiser. Before the follower is screwed down the second time, it is turned around part way, by means of an iron rod thrust down upon its upper surface. The bars upon the lower surface do not then go back into the same old grooves in the sack of slum gum. This loosening of the screw, and re-applying of the pressure, may be repeated as often as thought advisable. It will be noticed that the pressure is applied under boiling hot water; that the wax rises to the top of the water as fast as it escapes from the slum gum; that it is not entangled nor retained by the burlap.

We will suppose that we have secured all of the wax possible by pressure. The slum gum is in the sack; the press is full of hot water, with the wax floating on top; Mr. Manley then pours off this hot water and wax into what might be called a cooling, or separating tank. The screw is then loosened and removed, the sack of slum gum taken out, and the slum gum shaken out into some old box or barrel. There is no wax, propolis, nor stickiness about the sack after it is emptied—just as nice and clean as when first put into the press.

This cooling, or separating tank, will probably hold a barrel. It is perhaps two feet high, and a trifle more than that in diameter. It is made of galvanised iron with a gate or faucet at the bottom, and another perhaps six inches from the top. There is also a glass guage in its side, through which can be seen the line of demarcation between the water and the wax. It will be seen that, from the lower faucet, hot water may be drawn from beneath the wax, leaving the wax in the tank, and using the water for melting the next batch of wax. This is one of the biggest points of the system, that of using the same water over and over again before it cools. Keep dumping the melted wax and hot water into this tank, and keep drawing off the hot water from beneath the wax, as the water is needed. Some water will be lost by evaporation and some will be absorbed by the slum gum, hence the necessity of hot water in the reservoir to replenish the loss. The upper faucet is used to draw off the melted wax if the tank becomes too full, or at the end of the "run." A look through the glass guage will show when the body of wax is at the right height to be drawn off. The lower surface of the wax ought to be a short distance below the faucet, so that little or no sediment will be drawn out through the faucet. If it is not quite high enough, boiling water can be added until the body of wax is at exactly the proper height. At the end of the day, or of the "run," the wax can be drawn off in this manner, simply leaving a little wax below the facet. This thin sheet of wax can be allowed to cool in the tank; and, by this plan, all of the sediment for the whole day's work, will be in this one place, under this one thin cake of wax.

For thoroughness, rapidity, and ease of operation, I doubt if any system of wax-rendering can compare with this plan of Mr. Manley's. He says that he can render from 150 to 200 pounds in a

day, depending upon the character of the old combs. While cost is not of so very great importance, the outfit is simple and inexpensive. Except the press, nearly everything can be bought at an ordinary hardware, and the press can be made by a tin smith. Mr. Manley says that his cost him about \$8.00.—“Beekeepers’ Review.”

In Combating Black Brood, Italian Blood is the most Efficient Weapon.

S. D. HOUSE.

Much that is written of foul brood is lacking in helpfulness because the writers fail to designate the kind of foul brood, or neglect to emphasize the principal factor that has led to success. There is a vast difference between black brood (European foul brood) and American foul brood; the former being more virulent and destructive, yet yielding to milder treatment. What I have to say in this article will have reference to European foul brood.

About four years ago I discovered some diseased brood in a colony that had been purchased the previous autumn. The same day that I made the discovery, one of the inspectors called, pronounced it “very suspicious,” and advised treatment by the shaking method. That evening, hoping to prevent any spread of the disease, the whole colony, bees, brood, combs and hive, was buried deep in the earth. But I was doomed to disappointment, as, during the season, eight more colonies showed the disease in a mild form.

The next spring my troubles began in real earnest. By June 15th there were 160 diseased colonies in my home-apiary. I sent for inspector Mortimer Stevens, and he came accompanied by inspector Chas. Stewart. They pronounced it black brood in its worst form, and ad-

vised shaking off the bees, stacking up the brood to let what there would of it hatch, burning out the inside of the hives, and the melting up of the combs. They also advised Italianizing.

Having three out-apiaries, with no one to help me, the item of labour was an important factor; so I decided to give the Alexander plan a trial on part of them. I dequeened 40 colonies, and, 10 days later, gave each a ripe queen cell from healthy Italian stock. I did the work carefully, and was full of hope, but the disease appeared again with the second filling of the combs. I then shook the greater part of them and doubled them up. A few were dequeened and given the Alexander treatment the second time, and those colonies cleaned up and stayed cured. Later experience has taught me that it was not the second treatment that effected the permanent cure, but the presence of Italian bees that were hatching out. If I had given them more time they would have cleaned up without the second shaking. The rest of the colonies in this apiary were shaken, the combs melted and the frames burned, but the disease reappeared, that same season, in some of the colonies.

The following season the disease appeared in one of my out-apiaries; also in a good many of the colonies at the home-apiary; even among those that had been shaken the previous year but not requeened. Upon studying over the situation, I noticed that it was the hybrid and black colonies that did not stay cured, no matter what kind of treatment was given. There were some pure Italian colonies in all of the apiaries, and, with a single exception, not a single diseased cell had been found in them, even with diseased colonies all about them. This exception came from the giving of a comb from a supposed healthy colony that afterwards proved to be diseased. As a test, this colony was left undisturbed, and it cleaned up during

the season, and has remained healthy since. I have witnessed several instances where a single colony of Italians has survived without cure or treatment, in some farmer's small apiary; not even shown a trace of the disease, when the rest of the apiary of blacks or hybrids died with black brood.

WHY THE ALEXANDER PLAN HAS FAILED.

There has been much discredit given the Alexander plan of treating black brood, but I believe the failures have arisen not so much in the treatment, as in the race of bees. Let me give an illustration: Mr. Howard Mills of Syracuse had an apiary of 100 colonies of blacks. When the disease appeared in his apiary, he called in the inspector, who instructed him to shake off the bees, destroy the combs, etc., which was done at considerable expense, yet, the same season, the colonies became so badly diseased, again, that Mr. Mills destroyed all of them in the fall, and went out of the business.

Again: Mr. Irving Kinyon, of Fairmount, bought an apiary of black bees that were badly diseased. In the fall he dequeened and doubled up about 25 colonies, expecting to introduce Italian queens, but the dealer of whom the queens were ordered failed to furnish them, as the season became so far advanced that it was not safe to ship them. As a result, these colonies went through the winter queenless. In the spring the Italian queens were introduced, and those colonies freed themselves of the disease. A few colonies showed traces of the disease in the second hatching of bees, but the Italian bees soon cleaned out the dead larvae, and the disease disappeared entirely. I could mention many similar cases showing that there is more in the strain of bees (Italian) in combating the disease, than in any method of treatment.

There is one more point: Don't be alarmed if a few diseased larvae show

in the second filling of the combs after introducing an Italian queen. Give the Italians time, and they will clean these out.

In a December (1909) issue of "Gleanings," Dr. C. C. Miller has a very interesting article on black brood, or European foul brood. He mentions what he considers an important discovery, viz., a colony with a laying queen cleaning out the disease and becoming healthy. I agree with the Doctor on this point. Mention has already been made of an Italian colony into which the disease was introduced by giving it a comb of brood from a diseased (but supposed healthy) colony. I may say here that I even went farther than that. A brood chamber of diseased brood, from which the bees had been shaken, was placed on this colony, with no queen excluder under it, yet those Italians cleaned up the combs, and they have remained free from disease to this day. There was a honey flow on at the time, which is an incentive to cleaning up.

I shall have to differ from the Doctor, however, on the importance, or desirability, of getting rid of the disease with a laying queen in the hive. First, why prolong the existence of the disease? Second, no queen should be kept, any great length of time, that was in the hive at the time that the disease was contracted.

QUEEN'S SIMPLEX UNCAPPER.

How do you manage with your cappings? Do you go the old way—uncap into a box, and, after draining, stow away in tins to be dealt with at the season's end? Don't you find it a very disagreeable, messy and wasteful process all through. And it is not necessary. Packing cappings away, emptying them out again, melting down, and the rest—you

are saved all this by using Geue's Simplex Uncapper. You save something more as well. Going on old lines, for every fifty pounds of honey extracted, a pound is left on the cappings. The honey from melted Cappings being unsaleable, the loss in a crop of five or six tons is 200 or 300 lbs. This means £2 or £3, the price of a Simplex, which, moreover, will last for years. By using an Uncapper you save honey, money, labour and temper; and the Simplex is as handy and cheap as any in the market.

The Simplex is true to name. It has no parts to get out of order. A touch with the soldering iron will repair the worst damage likely to be done to it. It is handy in size, and weighs only 25 lbs. It is in short, a double walled vessel of peculiar shape, solidly made of heavy galvanized iron, with copper fire-bottom; works by means of boiling water, the water being in the jacket, formed by the double wall, and the heat being supplied by a Perfection Stove, or, if you like, an oil-drum fire; has a knife heater, uncapping box, and receiver for honey and wax; the knife heater will take a twelve-inch knife, if you use one; the uncapping box will melt ten pounds of wax an hour, while the receiver is of 350 cubic inches capacity, so that wax may be run off in blocks up to ten pounds weight if desired.

The receiver has an outlet, which outlet is the important part of the Uncapper. As you know, honey, slum-gum, and wax are bulk for bulk of different weights; pour the three, in liquid state, into a vessel, and the honey goes to the bottom, the slum-gum floats on the honey, and the wax on the slum-gum. The Simplex outlet works on this fact. Through the double wall of the receiver a vertical passage about 3 inches long by $\frac{3}{8}$ inch wide is made; over this, on the outside, is fixed a sliding door, with two taps, so placed that when the slide is in the shut position, one tap is below, the other above

the passage. In working, the honey, wax and slum-gum run from the uncapping box into the receiver, which is so shaped that an inch deep of honey in the bottom weighs only a few ounces; you raise the slide just enough to keep honey trickling without letting off wax or slum-gum, and so work it all day. This means that the honey need not remain beyond a minute or two in the uncapper, and so need not be darkened or otherwise spoiled by over heating. At the end of the day, or when the receiver is full of wax, you lower the slide, and skim the wax off the top of the slum-gum. You thus get a solid block of clean wax, fit to go to market. The slum-gum remains in the receiver, and may be lifted out in a block when it cools.

Therefore, if you use Geue's Simplex Uncapper, you have at the day's end, instead of a mess of cappings, a tin of clean honey, a cake of clean wax, and a cake of slum-gum, with a remnant of wax to be taken out in the wax press. Thus you have no waste, and a minimum of trouble.

See advertisement for price.

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