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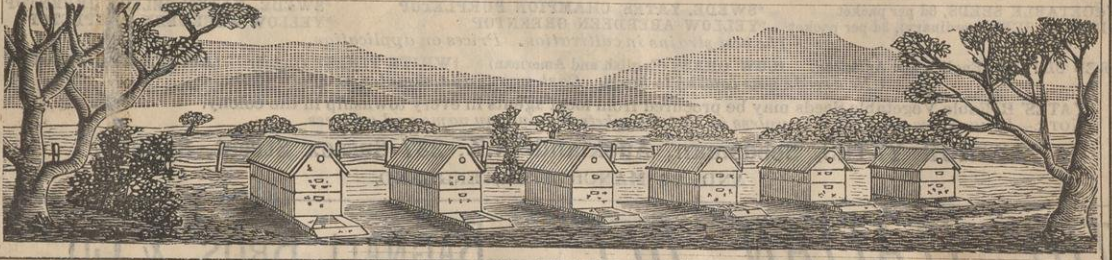
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R. J. Gribb
12/11/87

THE AUSTRALASIAN

BEE JOURNAL



No. 5. Vol. 1.] AUCKLAND, N.Z., NOVEMBER 1, 1887. [PUBLISHED MONTHLY SIXPENCE.

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Telephone 285.

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Proprietors and Publishers of

Publishers of

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THE AUSTRALASIAN



BEE JOURNAL

No. 5. Vol. I.] AUCKLAND, N.Z., NOVEMBER 1, 1887.

[PUBLISHED MONTHLY
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The Australasian Bee Journal.

Editorial.

PUBLISHED MONTHLY

I. HOPKINS EDITOR.

HOPKINS, HAYR & CO.,

Proprietors and Publishers.

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Contents.

EDITORIAL—

Seasonable Operations - November	67
A Glance at the Future of Beekeeping in Australasia	68
The Proposed Pamphlet	69
Honey at the Hawke's Bay Show	69
Otago Beekeepers' Association	70
The Rising Honey Tide, by R. J. Kendall	70
Formic Acid in Honey, and How it Gets There	
Poppies—Foul Brood, by Lamh dearg Erin	71
Foul Brood, by G. Stevenson	72
Honey, the Natural Sweet, by T. J. Mulvany	72
Reduction in Railway Freights on Honey	74

CORRESPONDENCE—

A Reply to H. Naveau	74
Beekeeping Notes from Victoria	74
The Proposed Pamphlet, G. A. Green	74
" " Humble Bee	74

QUERIES AND REPLIES—

Insects in Hives	75
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EXTRACTS FROM FOREIGN JOURNALS—

How do Bees Make Wax?	75
Getting Bees into Surplus Cases	75
Trembling Bees—Foul Brood	76

ANSWERS TO CORRESPONDENTS.

To Mr. Augustus Voegel.—We shall be glad, if within our power, to give the botanic names of any trees, shrubs, or grasses of which you or any beekeeper may send specimen leaves or blossoms. They should be sent as fresh as possible.

Can Mr. Herman Naveau furnish Mr. Augustus Voegel, of Paterson, New South Wales, with a few numbers of German bee journals, for the edification of himself and German friends, interested in bee culture, but who cannot read English journals?

SEASONABLE OPERATIONS. NOVEMBER.

THE season, though considerably backward, gives promise of "catching up" in a great measure during the next few weeks, judging by the settled fine weather which now seems to have set in. The swarming season has commenced in some of the most favoured districts and during the next fortnight we may expect swarming to have become pretty general throughout New Zealand. Transferring may still be done, but the sooner it is finished now the better.

SURPLUS HONEY.

The novelty of raising comb-honey in the neat little one-pound sections for the first time generally induces beginners to devote their attention to it as soon as they start. Now, it requires particular care and experience to raise comb-honey in first-class form fit for market, and certainly not one out of twenty beginners are competent to do this. If all the comb-honey they raised at first were used in their own household there could be no harm done, but unfortunately lots of it finds its way into the market, and herein lies the mischief. Thousands of third and fourth rate sections may be seen on the market every season, the majority of which bear the unmistakable sign of having been raised by inexperienced beekeepers. Such sections rarely bring more than about 3s per dozen, and it is often difficult to dispose of them at that price. Experience has taught us that it costs weight for weight at least twice as much to raise comb-honey in sections as it does extracted honey, and that the very lowest payable price that first-class section-honey can be raised at, even under the most favourable circumstances, is 7s per dozen net at the apiary, taking one season with another. There is no doubt that the market for first-class comb-honey has been spoiled by the quantity of inferior stuff it has been flooded with. Two seasons ago we were asked by an Auckland firm to give a price at which we could supply them with one or two tons of comb-honey in one-pound sections. The reply was, "eightpence per section, at which price we would guarantee every section to be well filled, completely sealed, and turn the scale at 1lb." However, we suppose the price was too high, as we heard afterwards somebody arranged to supply them at sixpence, but the speculation for the firm turned out a complete failure. Our advice is, do not attempt to raise comb-honey for market unless you have sufficient experience to guide you, and are prepared to give the attention required to raise a first-class article. The following constitutes a first-class article of section honey:—In the first place, the section itself should be made of clean, light-coloured timber not more than one-eighth of an inch thick, and should be fairly smooth, at least on the outside. The comb should be perfectly flat, and completely fill the section, leaving no holes round the edges. The capping of the comb should be white and transparent. Every cell should be capped, and the section box free from propolis. Such sections will average in weight nearly 1lb 1oz. each.

We are satisfied it will prove much more satisfactory to

beginners not to attempt to raise section-honey for market, for it will only result in disappointment both as to quality and price, and do injury to the trade.

SURPLUS BOXES.

Supers should not be placed in the hives until the weather is fairly settled and warm honey coming in pretty steadily, and the lower box or brood-chamber is getting well filled with bees. Care, however, must be taken that it is not delayed too long, or preparations may be made for swarming, and so upset our calculations. If extracted honey is the object, and the full bodies are used as supers, two of the side combs containing honey only and the adhering bees should be transferred from the lower hive to the centre of the super, their places being filled with the two frames of empty comb or foundation taken from the super, which will be the better if placed near the centre of the lower box. This will induce the bees to commence work at once in the upper box. We have mentioned full bodies above, because we know there are some using half-story bodies with narrow frames to suit, which they very much prefer to the others. Some advantages can be claimed for them, while there are certain disadvantages connected with their use compared with the full stories. The advantages are in the boxes being lighter to handle and the combs much stronger on account of being only half the usual depth. The latter is of some consideration where the honey is of a thick nature, and difficult to extract. On the other hand, the frames are not interchangeable with those in the lower hives, which is a very considerable disadvantage, and the boxes and frames for a given amount of honey cost nearly or quite as much again as the others. Notwithstanding, there are beekeepers who prefer the half-stories after using both kinds. It is just one of those points that every beekeeper should decide for himself, but for our own part we prefer to stick to the full story.

Many use only one story above the brood nest, but for many reasons we prefer to use two. If the season is a good one a single super does not give sufficient room for all the bees to work profitably; the hive gets overcrowded, and the consequence is a lot of bees are either forced to remain idle or a swarm is thrown off. By using a second surplus box, which should be put on next the lower hives as soon as the first one is about two-thirds filled, overcrowding is avoided, and time can be allowed for the honey as it is stored to ripen before it is extracted. The brood-chamber is kept cooler, and the hive, as a whole, better ventilated.

Various kinds of crates and boxes have been recommended for holding sections when working for comb-honey, but we have always been in favour of the half-story and wide frame system, and we notice, after many ups and downs, it is now in most favour with many of the leading beekeepers in America. The non-separator system has had a good trial, too, but the old one, with separator, is now generally deemed the most satisfactory. We never advise using the full body super for comb-honey; at least two, if not more, half-stories should be used instead. Only one should be put on at first, and to entice the bees to take to it two or three sections containing worked out comb should be put in the centre frame. There are generally some of these partly worked taken off at the end of the season which should be kept carefully till the next one, but in the absence of these a clean comb cut from a frame and fitted into three or four sections will answer the purpose as well. When supers of sections are put on several hives advantage may be taken of the first colony that starts to work in them to transfer one or more sections with the wax-working bees in them to the other supers. This rarely fails to accomplish the desired object. After the bees are well at work in the first super it should be lifted and the second one be placed underneath, and if a third one is used it should be placed under the second as soon as there is a good force of working bees in the latter. By that time there will be a good number of the centre sections in the first one nearly finished, and these should change places with the side ones that are not so far advanced. As soon as any sections are finished, that is, completely capped over, they should be removed (but not till then) and stored in a dry, well-ventilated room after having the propolis removed. The

uppermost super will be finished in time to place below again if needed.

I would particularly draw attention to the absolute necessity of using full sheets of foundation in the sections. Do not, through any false idea of economy, neglect this point, and think you can get good, well-filled sections by using strips only, or you will find yourself woefully mistaken and your work spoilt.

As the temperature rises give more ventilation by enlarging the entrance to the hives, and shade newly-hived swarms. Keep down weeds and long grass around the hives, and see that the alighting boards are properly fixed. A first sowing of mustard and buckwheat seeds for autumn forage may be made this month.

A GLANCE AT THE FUTURE OF BEE-KEEPING IN AUSTRALASIA.

THE fact that a few of our prominent beekeepers have expressed doubts as to the prospect of any change for the better in the honey trade in the near future, calls for an expression of opinion on our part. Our all being invested in the industry naturally makes us take the greatest interest in its future, while our position and connections give us a better opportunity than perhaps any other individual has of forming something like a correct opinion. What with a slow demand and the low price of honey during the past eighteen months, established beekeepers who have gone to great expense and made beekeeping their sole or principle business, have had much cause to make them feel anxious about the future. However serious may be the position with some at present, it would be still more serious to give up beekeeping if there is the slightest chance of things improving. It would not only mean a heavy pecuniary loss, but the loss of some years' work as well; so that the matter should be considered from every point before such a step is decided upon. Let us briefly review the past, and this may help us to see more clearly into the future.

During the years 1882, '83, '84 and 1885, there has been a great rush into the beekeeping ranks. Some started with the intention of devoting the whole of their time to beekeeping, while the great majority only took it up as a side issue, or for amusement. The result was that in the season of 1885-86—which was an exceptionally good season in most parts—there was an enormous increase in the output of honey, which, of course, had the effect of bringing down the price considerably. To make matters worse, those who had taken to beekeeping for amusement, finding they had more honey on their hands than they could dispose of in their own household, rushed it into the market in anything they could get handy, without any effort to make it look decent even. This, of course, found its way to the auction rooms to fetch whatever it might, as it would all count as profit to those who had raised it. The market was glutted with this cheap honey, no effort had been made to increase the demand in our home markets, and the consequence was that those who depended on the sales of their crops for a living found there was no demand. Trade depression followed, and in many cases large crops of first-class honey had to be sacrificed at any price, while others who could better

afford to hold on, found themselves at the opening of the season of 1886-87 with the largest portion of their previous season's crop on hand. Though last season turned out a comparative failure, and did not add much to the stock of honey already on hand, the great depression had the effect of checking the demand to such an extent that the season's crop, short as it was, appeared to be ample for all requirements. There is still some of the two last seasons' crops on hand, but it is steadily decreasing, and though there is no rise in price worth mentioning, yet we have reached the lowest that we shall see for a long time to come.

The bad season of last year, followed by a bad winter, combined with the low price of honey for the past eighteen months, has caused hundreds of small beekeepers, who were not depending upon beekeeping for a livelihood, to drop out of the ranks, and this must have a particularly good effect by reducing the quantity of honey that hitherto was sold at auction. However good the present season may turn out, we feel certain that the crop will not more than meet the demand. Sugar, which has been at a ridiculously low price, is not likely to remain so much longer, and any rise in price is bound to affect the honey trade beneficially. It is certain we shall not have such a "boom" in the beekeeping ranks again, so that taking all things into consideration, the prospects for the future are cheering, and it would certainly be rash on the part of any established beekeeper to take any step just now that will throw him out of the industry, when all difficulties are well-nigh past.

THE PROPOSED PAMPHLET.

THE second and concluding part of Mr. Mulvan's draft of the above appears in this issue, so that every one interested will now have an opportunity of offering suggestions and will understand exactly what the pamphlet will be like. As we previously stated, it is intended that it shall be printed on good paper in large clear type, and the whole be made as attractive as circumstances will admit. The first eight pages or so to be occupied by the matter already published and the other four to contain the best recipes known. We have obtained estimates and find they can be done at the price we gave in the last issue, viz., 5s. 6d. per 100.

No time should be lost as the honey season is advancing and the pamphlet should be ready for distribution before the new season's honey is in the market. It will take at least a month after the printer receives the order before they would be in the hands of beekeepers, so if the thing is to be done the orders should be sent in at once.

HONEY AT THE HAWKE'S BAY SHOW.

FROM OUR OWN CORRESPONDENT.

THE Hawke's Bay Agricultural and Pastoral Society held their annual show on the 6th and 7th of this month, but as this is intended for the *Bee Journal* I will simply confine myself to what will interest the beekeeping fraternity. Mr. J. Adam-

son, of Pine Apiary, Hastings, had a very good exhibit of honey in jars, bottles, and tins, also honey vinegar, hives, and foundation-comb, which were very well got up indeed, and he deserves great credit for the trouble and expense he put himself to in bringing such a varied and useful collection of appliances for working an apiary on the latest and most scientific principles so prominently before the Hawke's Bay public.

The exhibit of Mr. W. A. Neale, of Longlands Apiary, of comb and extracted honey, together with two boxes of Ligurian bees, hybrids and blacks, had a crowd round it all day. The extracted honey looked uncommonly tempting put up in the neat 1lb. and 2lb. clear glass jars, with their bright metal screw tops. There was some 40lbs. of this shown in a handsome glass case made of kauri, rimu, and honeysuckle; also 50lbs. of beautifully white crystallised extracted honey in 10lb. tins. The show jars were got down especially from Auckland, and the thanks of the exhibitor are due to Mr. Hopkins for his attention and advice in the matter. This exhibit was awarded first prize.

The Comb Honey.—This exhibit was a splendid one and was universally admired, it being the first time such a perfect exhibit has ever been shown in Hawke's Bay. The raising of comb-honey, I was told by the exhibitor, is a specialty in the Longlands Apiary, and he deserves great credit for the neat and natty way it was put up, and justly earned the first prize which was awarded for the exhibit. Four glass cases containing sixty-four sections of perfect comb-honey were ranged on either side of other two glass cases containing large extracting frames full of beautiful comb-honey. This, together with some sections showing comb in formation, and a section of honey which was shown in the exhibit of last year, completed this portion. This section of two-year-old honey was in a good state of preservation, which clearly demonstrates that, provided comb-honey is kept in a dry and even temperature, it will keep a long time.

Last, but not least, the exhibit of Ligurian bees—and a case of hybrids and blacks for contrast. These were put up in miniature hives with glass sides, about the size of "Hopkins's shipping boxes," with a section of honey put in for the bees to feed on. The Ligurians are the progeny of queens imported from Matamata Apiary and sent down by Mr. Hopkins in December last. They looked as if they meant business, as they were constantly on the move, and for industry are not to be beaten. I did not see much difference between the Ligurians and Hybrids, save that the latter were not so brightly banded as the Italians, but they looked a fine, active, and useful bee, and I am glad to find that we are in a fair way of having some useful bees reared in this district.

I was considerably amused by a person exclaiming, "Why, them's wasps! I've seen hundreds in the old country, and fancy putting them nasty things in boxes like that. They are no good, and he ought to be ashamed of himself, trying to take us in and the judges too, a giving 'em a prize for this extra exhibit." The exhibitor himself was standing by, and with a merry twinkle in his eye nudged me

and said, "Where ignorance is bliss, 'tis folly to be wise."

[We are glad to see our Hawke's Bay friends making so good a show. This would have been a splendid opportunity to distribute such pamphlets as we are now considering. We hope that the number of exhibits will increase each season.—ED.]

OTAGO BEEKEEPERS' ASSOCIATION.

JUST as we go to press the following circular has come to hand, and we gladly give it insertion, trusting by so doing to aid in making the objects of the Association more widely known:—

An Association called 'The Otago Beekeepers' Association' has lately been formed in Dunedin, having for its objects the furtherance of scientific beekeeping within the district of Otago.

The aims of the Association are to encourage as much as possible the use of the modern beehive, and to impart a knowledge of the best methods of manipulating and treating the honey-bee so that the barbarous and useless method adopted by some beekeepers of destroying the bees when taking the honey may be discontinued.

It is proposed to hold periodical meetings, at which ideas and experiences can be mutually interchanged, and papers on the subject of bee culture read and discussed.

It is also proposed to hold, in the course of each season, one or more exhibits of honey and apiarian appliances, when demonstrations will be given illustrating the modern methods of handling bees, etc.

The following periodicals have been ordered, namely, 'The British Bee Journal,' 'Gleanings in Bee Culture,' and 'The American Bee Journal,' and it is intended to circulate these amongst such of the members of the Association as may desire to read them, so that they may be kept posted up in bee literature, and in the latest methods of bee culture.

Similar associations are working with great success in Great Britain and America, and through their exertions many beekeepers have discontinued the antiquated system of killing the bees when taking the honey.

Looking at the subject merely as a matter of advantage to the beekeepers, frequent tests have proved that twice as much honey can be taken from the modern hive as from the old, leaving at the end of the season the bees unharmed in the new hive with sufficient honey to live on through the winter.

The promoters of the Association trust that their aims will enlist the sympathy of the general public, as well as of the honey consumers and beekeepers.

I have been requested to ask you to assist the undertaking by becoming a member of the Association, and if you will consent to do so kindly return to me the request enclosed duly signed with the sum of five shillings, the annual subscription, on receipt whereof I shall be happy to insert your name in the register of members.

Any further information you may require I shall be happy to supply you with on application.—I have, etc.,

W. C. BROWN, Hon. Sec.

[Please enter me as a member, and I trust the Association will be a success.—I.H.]

THE RISING HONEY TIDE.

BY R. J. KENDALL.

WOULD it not be almost as well if the beekeepers of the colony now began to seriously consider the question of co-operation and arrange some definite plan? From reports to hand there is, and is likely to be, a short honey crop in the Northern Hemisphere. In America especially are they complaining of this scarcity. Of course, if the American crop is short, that means a considerable difference all over the world, for America is really the great honey field, after all. This shortage means higher prices at home and little or none for export. There will be no three cent honey sold in Frisco this year, and there will not be a great cargo sent over here. In New Zealand generally, and Auckland in particular, also, this year's crop is likely to be light. At present there is nothing in the market, and I recently heard of a packet of honey being sold at 2½d. that had been lying so long in stock that one beekeeper told me he would not have fed to his bees. Another thing, numbers of amateur beekeepers are getting sick of the business, and do not think the game worth the candle. The farmers outside too, who have been keeping a few bees and putting that lovely mixture of honey, wax, bee wings, legs, pollen, and dirt, usually designated "strained honey," are about stalled off; and, taking one thing with another, if the season coming is at all a fair one, the prospect of good things for the legitimate beekeeper are very favourable. Now if we are wise we will utilise this state of things by concerted action and begin to organise, and as a suggestion I would ask, would it not be a good idea, as suggested by the editor in the last number, to get out something in the shape of advertising, a pamphlet on honey, its uses, etc., to spread broadcast, say the lecture read by Mr Isaac Hopkins at the Exhibition of the Auckland Industrial Association in Wyndham street, and published in this paper, or that drafted by Mr. Mulvaney? I do not know if the editor has preserved the type or got the matter stereotyped, but if he has, it seems to me it would fill the bill exactly. Perhaps Mr. Hopkins will state in what shape this is, and whether it can be utilised. However, I merely throw out this idea because I think it is time something was done. The co-operative idea seems to be regarded favourably. I don't see that we can lose much by a trial anyway, and it may be the means of putting a good substantial sum in beekeepers' pockets. Then, again, the marketing and sale of this year's crop should be thought about, so that united action of some sort could be taken on it. The great trouble with us is we are too modest. We seem to be all (except myself) in the position of the parson's parrot that was not much as a talker but a de'il to think. I have had my say about the pamphlet idea, and now I am going to give up the floor for some other beekeeper to improve the occasion by giving his ideas on what should be done, and how best to do it. I

remember reading, in a Yankee paper of course, some time ago, this sentiment—

“It is not birth, or wealth or state,
But energy and pluck that makes men great;”

and it seems to me that this is just what we want now.

[The type of the lecture matter has been broken up, but it could hardly have been utilised for the pamphlet as it was. It needs revision, as there is a good deal in it, though suitable for a lecture, that would scarcely be required in such a pamphlet as we need. For our own part we are in favour of Mr. Mulvany's draft, but in either case we do hope steps will be taken to get out a pamphlet.—Ed.]

FORMIC ACID IN HONEY, AND HOW IT GETS THERE—POPPIES—FOUL BROOD.

SOME people have an idea that the most important function of a bee with regard to its sting is to see how far she can drive it into the most taking part of the human body, but a new champion has arisen in Mr. W. F. Clarke, of Canada, to defend the honey-bee from the obloquy under which it has rested. He says, “that from his own repeated observations the most important function of a bee's sting is *not* stinging, but otherwise, that the sting is used in doing the artistic cell work, capping the comb, and *infusing the formic acid* by means of which the honey receives its preservative qualities; that the sting is in reality a skilfully-contrived little trowel with which the bee finishes off and caps the cells when full of honey. This explains why honey extracted before it is capped over does not keep. *The formic acid has not been injected into it.* This is done in the very act of putting the last touches to the cell work. As the little pliant trowel is worked to and fro with such dexterity, the darts, of which there are two, pierce the plastic cell surface and leave in the nectar beneath its tiny drops of the fluid which makes it keep so well; this is the ‘*art preservative*’ of honey. Herein we see that the sting and poison-gland, with which so many of us would like to dispense with, are essential to the storage of our coveted product, and that without them the beautiful comb honey of commerce would be a thing unknown.”

I note C. B. Morris' query with regard to bees working on poppy. It was only a week ago that a neighbour gave me a lot of French poppy seed, with the remark that they were good for bees. On my asking him his reason, he said, “I had a bed of French poppies last year and the bees were on them all day long.” So they must get a certain amount of nectar from them, but whether the noxious property of opium is conveyed to the honey remains to be proved—for my part I should fancy it would. Mr. Naveau's recipe for foul brood which, should it prove successful, will do a world of good. Query, is it a preventive as well as a cure? When once you have got your apiary clear of this pest, what guarantee have we of not finding, in the course of a week or so, our hives bad again? I cleared mine last year (after a great deal of trouble, but what

enthusiast minds that?), thoroughly scrubbed every hive, frame, alighting-board, with Calvert's 20 per cent. carbolic soap; boiled down old comb, scalded all frames and gave the bees new comb; but to my disgust I found I had got it again, and had to repeat the process this year. I think it is a risky experiment utilizing combs which have had foul brood in them, no matter how much they may have been medicated. I only use them after a thorough fumigation and spraying, and then only in the top story for extracting.

Now that foul brood has got such a hold in this province and New Zealand generally, I think the beekeepers should make some move in the matter and get an Act passed in which it should be compulsory for the lazy and apathetic “Foul Brood Diffuser” (I won't give him the title of a beekeeper), to either burn up his old cases or take measures for the speedy eradication of the pest on his own ground. It is these men who sow broadcast the seeds of disease in the district in which they reside, and when a “hive is took” is murdered with sulphur—all diseased comb is thrown on one side as useless and no further trouble is taken with it. The consequence is neighbouring bees alight on it, suck up diseased honey and brood-juice, and carry it straight to their hive, thus forming another charnel-house and hotbed of disease. Acts are passed for the prevention of scab and pleuro, and why not for bacillus alvei and all its attendant evils?

Union is strength, brother apiarists. Let us combine and do the best we can for our littled winged friends.

LAMH DEARG ERIN.

October 13th, 1887.

P.S.—Bees swarming. Every promise of a good season. Had some heavy rain on the 3rd and 4th, but did not hurt the bees as the temperature was pretty high. Clover beginning to bud. Apple, cherry, and apricot in full bloom.—L.D.E.

[Not until we take some practical steps to act unitedly can we ever expect to overcome the evils opposed to the progress of apiculture. It does appear the height of absurdity for any body of individuals to submit to all kinds of injury when a little effort on their part could remove, or at all events overcome, such obstacles as stand in their way. Can we not at once revive the New Zealand Beekeepers' Association? It only wants a little push on the part of each of us and the thing can be done; then measures can at once be taken to remove those evils we now find bearing so heavily upon us. Circumstances are much more favourable now for successfully working the association than they were when it was first started, but it needs the support of all before it would be worth while to act in this direction.—Ed.]

HONEY PLANT SEEDS.—We have a supply of the following:—Figwort, Spider Plant, Giant Mignonette, Catnip, Limnanthus, Douglasii, a herb similar to Catnip, Horsemint of Texas, and White Sage of California. Any of the first six varieties, 5d. per packet, post free, or a packet of each for 2s. Horsemint and sage, 1s. per packet, or a packet of each variety, including the latter, 3s. 6d. post free.—HOPKINS, HAYR & Co.

FOUL BROOD.

SOME observations on foul brood from a victim of the disease may be of interest to some of your readers, as I believe it is very prevalent in the colony.

In this district it was unknown till the very cold and wet spring of 1884, when the Roseland Apiary of nearly 400 hives near Gisborne was attacked, with the result that in two years not a living bee remained. I believe it was caused by the hives being left short of honey in the previous autumn, and in a state of starvation, ready to fall a prey to the disease.

At that time my own bees were in perfect condition, and continued so till the following spring, when, on examining the hives in September, I was alarmed to find that the two centre combs of more than half the hives were foul broody, the remaining frames containing healthy brood. I removed all the diseased combs, and soon the hives were strong, and during the summer months I saw no trace of it. I used no remedies. That winter I spent in England, and the bees were not interfered with till my return in October. Like the previous one it was a dry, sunny winter. On examination the hives were in exactly the same state as in the previous year, the centre combs containing brood from eggs laid in the late autumn or during winter not hatched, the more recent brood healthy. I proceeded as before, excepting that instead of immediately removing the diseased combs, I placed them at one side of the hive for a week or ten days to give any healthy cells a chance of hatching. Again all went fairly well during the summer, and in April I had 140 hives in good condition and well provided with winter stores. I then made up my mind to make a thorough trial of phenol, removing all the bees into clean hives, and spraying the combs, keeping a sharp look out for any signs of the enemy. The weather defeated this programme at the time. During May and June there was scarcely a dry day, and it was not till the middle of July that a break came, and a few sunny days gave me the desired opportunity. Very little brood-rearing was going on, but as before there were several combs full of diseased brood, in some as many as four or five. All of these I destroyed; the remainder, including the bees, were sprayed with phenol (1 to 400) and removed to clean hives, which, together with the bottom boards and covers, had been disinfected by boiling in a strong solution of carbolic acid. A great many hives were so weakened as to fall below the recovery point, and dwindled away in spring. The remainder, about 70, I have again examined, and I find, just as before, foul brood in the centre combs from eggs laid since the middle of July, but before the advent of warm weather—healthy brood in the remaining combs.

Now, what conclusion am I to come to? I can't say I observe any impression made by the phenol on the disease, as the hives are in just the same state as last year when I used no remedies, and if weaker in bees that may be accounted for by the very trying season.

What is chiefly observable is that brood from

eggs laid in the late autumn and winter get foul broody, whereas eggs laid in spring, when the weather has become drier and warmer, produce healthy brood, or at any rate brood that hatches.

Is this the result of a constitutional weakness in the queen, disabling her from imparting sufficient vitality to brood produced under the adverse conditions of cold and wet weather, or is the disease simply a fungus germ, which, like a mushroom, has its season of growth, and fastens on the winter brood? If the latter, the spraying by phenol must be of value, while if, as Mr. Cheshire maintains, it is a disease of the queen bee, outward remedy can hardly be expected to be efficacious, and the best plan would be to change the blood by importing a number of new queens from apiaries not infected. If some of our friends will act on this suggestion, and send me a few by post, I shall be grateful to them for helping me to get rid of a plague that threatens to extinguish beekeeping here. Meantime I shall continue using the phenol. I find the spray as good as a smoker in handling bees. I have also invested in half an ounce of the corrosive sublimate, which I shall use in disinfecting the hives. The extent of my loss through foul brood may be estimated when I say that I have had to destroy 1,200 combs this spring, and have more to follow.

GEORGE STEVENSON.

Tareheru Apiary, October 19.

[We believe Mr. Cheshire has clearly proved beyond a doubt that foul brood is a germ disease that attacks both old bees and larvæ, and the germs have even been discovered in eggs when first laid by the queen. This being the case, it seems impossible for any remedy to be effective that does not reach the seat of the disease, and this only appears possible by administering the germicide in the food. Of course the spraying of combs and hives with a germicide must have a good effect, but alone is not sufficient.—Ed.]

HONEY, THE NATURAL SWEET.

(Continued from page 59.)

EXTRACTED HONEY.

MANY people may not know exactly what the term extracted honey means. It is of importance that there should be no misconception on this point. It may then be shortly explained that under the modern system of apiculture, whatever may be the exact form of hive adopted, all the combs are built in moveable frames, which can be shifted or entirely taken out of the hive at the pleasure of the apiarist. When a frame of comb is filled with honey which it is desired to extract, it is taken out of the hive, the "cappings" or waxen coverings which the bees place over the cells when filled are removed with a thin sharp knife, the frame placed in a wire cage or basket which is made to revolve rapidly within an open-topped cylinder (the extractor), when the honey in the cells on the outer side of the frame is cast out by the centrifugal force and caught in the bottom of the extractor; the frame is then turned in the cage and the honey extracted in the same way from the other side. The honey so procured from the frames flows out of the bottom of the extractor through a tap into a strainer, the bottom of which consists of fine wire gauze such as is used for straining milk. The pure honey, freed from the minutest particles of wax or other foreign substance, passes from the strainer into a tank where it is allowed to settle until the air bubbles settle on the surface in a thin froth, and can then be

racked off through the tap or honey-gate at bottom of the tank into the tins or other vessels in which it is to be sent to market. The force applied is just sufficient to dislodge the honey from the cells, but not the bee-bread (if there should be any in the comb), and any small pieces of wax or other light matter are excluded by the strainer. Thus nothing but the pure honey can find its way into the tank, and in the whole process, from the uncapping of the combs to the filling and soldering of the tins, where such are used, the liquid honey is not exposed to any handling, squeezing through cloth, or other manipulation which can interfere with the perfect cleanliness of the preparation. It must therefore be clear to anyone who will take the trouble to follow the foregoing explanation, that honey properly extracted and put up in this way must be *absolutely pure* unless purposely adulterated.

The frames, when emptied in the above manner, are returned to the hives and the bees are saved the trouble of building fresh comb, and can again fill and re-cap the cells in a much shorter time than would otherwise be possible. It will be easily understood, therefore, how it becomes possible to procure a much larger yield of extracted than of comb-honey, and consequently to sell the former at a lower price, although it is, in fact, the purest form in which the honey can be brought into consumption.

The convenience of having the pure honey in this form, where large quantities are required to be stored, or transported to long distances, must be apparent. If the extracted honey be properly ripened before being tinned it will soon become a solid mass, and will keep without injury to its quality for any length of time, even after the vessel is opened and the honey exposed to the air. Housekeepers need therefore have no more hesitation about keeping on hand a sixty-pound tin, or a barrel of good extracted honey, than they would have about laying in their sugar by the bag or their flour by the sack, instead of purchasing these articles in small quantities according as they want them. The open vessel of honey only requires to be kept in an ordinarily dry store room and covered so as to keep out flies and dust.

ADULTERATION OF HONEY.

The legitimate honey industry is so injuriously affected by any attempt to impose adulterated stuff upon the public in place of the pure article, that it is necessary to give a word of warning to consumers under this head. It is true that since the selling price of honey has fallen so low as it has done of late, there is comparatively very little inducement for dishonest people to mix with it even the cheapest sorts of syrups, but still, under peculiar circumstances, it may be done. The presence of glucose, cane-sugar syrup, starch, and foreign acids in liquid honey may be easily ascertained by certain chemical tests; but the simplest plan for the purchaser is to obtain his honey either direct from an apiary or through a responsible agent; or if the honey be offered for sale by a retailer, to see that it is in the original packages with the label of a respectable producer, who must guarantee the absolute purity of the article which he offers for sale.

Comb-honey *cannot be adulterated*. This may be assumed as indisputable. An absurd story got abroad in America some time ago that beekeepers had discovered a way of manufacturing comb out of paraffin or some such substance, filling the cells with glucose, capping them over with wax, and selling this imposture in sections as the product of the bees. This was merely a silly hoax—all the art of even Yankee inventors could never produce artificial comb with fully formed cells of anything approaching to the thinness and delicate perfection of the bees' work.

Extracted honey, when pure and unmixed with glucose, generally becomes solidified in a short time. Quinby, in his "New Beekeeping" says:—"The first fact to be understood is that all granulated or candied honey is presumably pure." This is a fact not very generally understood by people who have not been accustomed to use extracted honey. Many who only know liquid honey as they have been accustomed to see it draining out of a fresh comb, when they first see extracted honey in a granulated state, think that it must be mixed with wax, bee-bread, flour, or some solid matter. A trial of the taste, or the melting of a portion of the honey by a gentle

heat into a liquid state, will at once dispel such ideas. It should be observed that there are some rare cases of pure honey gathered from some peculiar sorts of bee-forage, remaining in a clear liquid state for a very long time; but as a rule such honey should be looked on with suspicion, and put to a test. When granulated, on the other hand, it is certain that there is no mixture of glucose in the honey.

COLOUR OF HONEY.

There is a great variety in the colour of honey according to the sources from which it is obtained. The colour varies from almost white, through straw colour, amber, reddish, to a dark blood colour. The aroma and flavour of the honey varies also very considerably. The relative merits of the different sorts is a matter of taste. White clover honey, where it can be obtained pure, is generally admitted to a preference as to appearance and flavour. It must be observed, however, that lightness of colour *alone* is no conclusive evidence of superior quality. Some of the most prized sorts, as for instance that gathered from orange blossoms, is of very deep colour.

HONEY DRINKS.

MEAD and METHEGLIN are two names meaning nearly the same thing, and derived no doubt from the same root, which may be traced not only in the Greek, but also in the much more ancient Zend, or Persian, and Sanscrit language, signifying a "wine," or strong drink. When we come to the less ancient nations of the north and west of Europe, who did not enjoy originally the juice of the grape, but made their first fermented drink from honey, we find the Teutons named that liquor *meth*; the Saxons, *medo*, or *medu*; the Gaels in Wales, *mez*; and in Ireland and Scotland *miodh* or *meadh*. These words were evidently all intended to mean a wine or strong drink made from honey, and the Russians seem to have adopted the name for honey itself, which with them is *med* or *meda*. This serves to indicate the great antiquity and the very extended use of the beverage in question. Mr. Harris, the author of "The Honey Bee," who seems to have turned his attention to the history of honey drinks in Britain, says: "Properly speaking, the word *metheglin* was applied to the superior sorts of mead, the two beverages being related much in the same way as effervescing cider and the ordinary draught cider." He tells us that the manufacture of mead was considered of such importance, that the brewer of that beverage for former princes of Wales was the physician of the household, and ranked eleventh in point of dignity; that Athelstan, when King of Kent, is recorded to have expressed his satisfaction that "there was no stint of mead" when he visited his relative Aethelfleda; and that, according to an antique rule of the Welsh Court, there were "three things which must be communicated to the King before they were imparted to any other person: first, every sentence of the judge; second, every new song; and third, every cask of mead." Mr. Harris also gives the recipe according to which the mead was made every year for Queen Elizabeth, who was, it appears, very fond of that beverage. It will be found in a later page of this pamphlet.

There appears to be no sufficient reason why the making of mead should have been given up, except that the great increase of population, without a corresponding increase in the production of honey, rendered it impossible to supply the requisite quantity of such drinks, and brought into fashion the use of beer and ale, which can be manufactured in any quantities from malted grain. It is nevertheless indisputable that mead continued in great favour, as Mr. Harris remarks, long after the introduction of malt liquors, and it is probable that it only ultimately gave way to foreign wines, and to more potent, but less wholesome, distilled spirits.

Considering the increased supply and reduced cost of extracted honey at the present day, there is no reason why the taste should not be revived, and some portion at least of the beverages now in common use be replaced, probably with advantage in a sanitary point of view, by drinks skilfully prepared from honey. For home use in country places where bees are kept, or where honey can be obtained at first cost from apiaries in the immediate neighbourhood, such drinks are sure to come into

favour. Annexed will be found several recipes for the preparation of a variety of beverages, varying in strength from a light summer drink, like ginger-beer, to the potent miodomel of the monks of Toxat.

HONEY AS MEDICINE.

Physicians have been accustomed from the earliest period, and continue to the present time, to use honey both as a medicine and as a medium for administering some drugs. Mr. Newman, who has collected much information with regard to the uses of honey in his work, "Bees and Honey," gives the following quotation from a pamphlet by Herr Karl Gatter, a German teacher, and editor of the *Bienenwater*, at Vienna, who considers that his own life was saved by the use of honey for the cure of diseased throat and lungs.

REDUCTION IN RAILWAY FREIGHTS ON HONEY.

WE are glad to state that a very substantial reduction in the rates of carriage of honey is gazetted, and came into force on the first of this month. Extracted honey of local production will henceforward be carried under class C, and consignments of not less than 10 cwt. for export under class D; formerly it was rated under classes A and B. This means a reduction of from 35 to 80 per cent.—Ed.

Correspondence.

A REPLY TO H. NAVEAU.

TO THE EDITOR OF THE AUSTRALASIAN BEE JOURNAL.

SIR,—If Mr. Naveau will read my little article in your first number again, I think he will find that nowhere have I attempted to attack the Germans as beekeepers. I simply said that the *first bee journal in the English language was published in America*, a statement I still adhere to, and I am perfectly aware that one was published in Germany previous to that, to which I should long ago have become a subscriber, but, like yourself, Mr. Editor, I am totally ignorant of the language, and consequently could hardly have been supposed to know that the first editor, Mr. Wagner, or the present editor, Mr. Newman, to be Germans. The bar frame hive is now, I think, generally allowed to be the simultaneous invention of Langstroth in America, and Dzierzon in Germany. I willingly give to Germany the honour of the invention of the honey-extractor and wax plates: in fact I never said otherwise, and in my public lectures I have always credited them with these and other inventions, and have always spoken of the Germans in the highest terms as scientific apiarists.

Yours, etc.,

O. POOLE.

BEEKEEPING NOTES FROM VICTORIA.

TO THE EDITOR OF THE AUSTRALASIAN BEE JOURNAL.

SIR,—Since writing you last I have given further attention to the glucose business in this colony, and am doing my best, as you can see by the two printed placards I send you, to warn the public against its use, though one individual can do but little in fighting against such big odds. I estimate that fully 200 tons of glucose is sold every year as honey in Melbourne alone. I intend in a few days to send you a one-pound tin of the stuff which is sold here in the shops at 6d. You will then have an opportunity of giving your opinion of it. I hope you will give it a thorough test, and, if you find it a fraud, that you will not fail to expose it through the *Journal*, as the fraudulent practice of adulterating honey is killing the beekeeping industry over here. Some of the stuff is sold as "Orange Blossom" honey from San José, California (?), and a traveller for one of the firms told a grocer of my acquaintance that they sold more of this article than all the different jams put together. Glucose is not only manufactured here but it is imported as well from Germany and America, and it is being used to adulterate

everything in the shape of syrups, confectionery, and even sugar, I believe. I never yet heard of glucose being used for an honest purpose. Bah! I am disgusted when I think that beekeepers take things so quietly as they do while being robbed of their living by dishonest traders.

You, Mr. Editor, might do a good deal if you had the moral support that strong beekeepers' associations would give you. I am satisfied that nothing but legislation in the desired direction can assist us, and before we can get anything done in that way there must be strong representation made by a united body of beekeepers.

What a blessing comb-honey cannot be imitated. We have that in our own hands yet; they cannot take that from us. I have some on hand over 2½ years old—a part of 300 boxes. *Bee honey* is getting rather scarce, and has risen a 1d. to a 1½d. per lb. I have before stated that our main crop of honey is obtained from the gums, and as most of those in this colony only blossom every other year we only get a good honey season every second year. The immense swarms of locusts last season did a terrible lot of damage to the gum blossoms, and so cut off the honey crop in many districts: so what, with insect pests and adulteration, the legitimate honey producer has rather a bad time of it here.

Yours truly,

ZIBER SUMNER.

Melbourne, October, 1887.

[We were rather inclined to doubt the correctness of the statement when first informed that the adulteration of honey was being carried on in Sydney and Melbourne, but from what has transpired since there seems no room for doubt. However, when we receive the sample of the supposed glucosed honey we will get it tested and learn correctly what it is.—Ed.]

THE PROPOSED PAMPHLET.

TO THE EDITOR OF THE AUSTRALASIAN BEE JOURNAL.

SIR,—The October number of the *Journal* is to hand, and in it I notice the draft of a proposed pamphlet. I consider this a step in the right direction, and if it can be brought to a successful issue will no doubt result in a largely increased consumption of honey. Of course the result will depend in a great measure on the pamphlet having a judicious distribution. As you request those interested to club together and take (if it is but a few) copies of the proposed pamphlet so as to secure its publication, I therefore add my mite and put my name down for fifty (50) copies. You also request those interested to give their opinions and suggestions. I will accordingly make a few remarks.

I think a little more space should be given to the subject headed "As to health." It would be well to include in it extracts from Mr. Hopkins's lecture (or from some other source) that would give instructions for the use of honey as a medicine in cases where it would be effectual. It should also give a list of diseases curable, or that would be alleviated by the use of honey, together with the best mode for internal or external use in the different diseases.

So far as published, I think, with perhaps the above and a few other additions, the draft is nearly all that could be desired.

I hope beekeepers will express their views freely and then come forward loyally and support the pamphlet scheme, so that a large issue may be published. Beekeepers, you will find it pay.

I am, etc.,

G. A. GREEN.

Dairy Flat, October, 1887.

[Thanks for suggestions and order.—Ed.]

THE PROPOSED PAMPHLET.

TO THE EDITOR OF THE AUSTRALASIAN BEE JOURNAL.

SIR,—The idea of the proposed pamphlet on the use of honey as food is a capital one, and in the interest of beekeeping generally will, I trust, be earnestly taken advantage of by apiarists. It is seldom the opportunity occurs

of obtaining such a cheap method of advertising one's wares, and I only wonder that something of the sort has not been attempted before. At the same time would you allow me to suggest that portions of the paper recently read by yourself before the Industrial Association should be incorporated with that of Mr. Mulvany.

Trusting that you may have a large circulation, and enclosing my subscription for 250,

Yours faithfully,
HUMBLE BEE.

October 14th, 1887.

Queries and Replies.

QUERY.—*Insects in Hives.*—One of my colonies is becoming very weak. I found a large, flat black beetle in the hive. Is there such a beetle known to be destructive to bees?—H. KING, Echuca.

REPLY.—We are not aware of any such beetle, and believe if you examine the colony well you will find some other cause for its weakness. Insects, as a rule, only enter hives containing weak colonies and are not the cause of the weakness.

Extracts from Foreign Journals, etc.

HOW DO BEES MAKE WAX?

BY VON H. FRAUDENSTEIN.

[Translated from the German by H. Naveau.]

EVERY one of us beekeepers has no doubt at some time, when standing before an open bee-hive, and under the influence which this marvel of Nature has upon our minds when in a thoughtful mood, studied the above question. To me the answer has always appeared difficult, and what I have to say on the subject here is meant rather as a stimulus to searching investigation in this field of science than as a solution of the query. In a letter to Herr Pastor Scöfeld I put the query, "Do bees have it in their power to make wax or not?" The reply removed from my mind the uncertainty I had previously laboured under, and I felt under great obligation to this gentleman for his courtesy. To some this query about the will of the bee may seem extraordinary, and to others it may appear foolish, but the sequel will prove whether it is or not.

For the secretion of wax the bees require honey and pollen, just the very same material which they require to feed themselves and nourish their young. These materials pass through the thorax into the var-huck, or honey gullet, and here only the bee feeds. Therefore their eating is not visible, but she takes what she needs as food after it has entered into the gullet. Into this reaches the mouth of the stomach, whose functions and constitution were first described by Pastor Scöfeld. The stomach-mouth is capable of moving forward and backward, to open or to close itself. She may suck honey or swallow pollen or the food mixture for the larvæ after it has been digested in the proper, or rather chylus-stomach; after this the stomach-mouth stretches itself through the gullet into the mouth of the thorax, and so directly discharges the food mixture into the thorax without mixing its contents with those retained in the gullet. Whatever the bee requires for her own nourishment she retains in the chylus-stomach. She has an almost fabulous digestive power; she digests even the cuticula, which are as strong as hair, and which, as everybody knows, are vomited up by all birds of prey as indigestible, and resists even the strongest chemicals. The food secretions (the blood) make their exit through the walls of the chylus-stomach into the afterpart of the body, and pass from thence through the whole system. Out of the blood—therefore out of the juices which penetrate the walls of the stomach—comes the wax. Wax, therefore, is nothing less than concentrated bee-blood. When we now bear in mind that in all animals the blood

is in close connection with the process of nourishing, you will concede that my question about the bees making wax at will was not a useless one. I knew, of course, that during winter and early spring the bees eat, make blood, but prepare no wax.

When the bees want to make wax they need to receive a far greater amount of food. The chylus-stomach gets completely filled, and whenever the chylus (the product of digestion) is ready the walls of the stomach contract themselves involuntarily. The blood enters in quantity in the afterpart of the body, and gets there through the respiratory organs with squeezing and shakings similar to churning cream in the preparation of butter; after this the mass passes forcibly through the skin. By this process comes a separation similar to that of butter from the buttermilk, and so forms the consistent mass of wax, which now appears in thin scales under the afterpart of the body, and a thin, watery fluid which makes its exit through the malphigy vessels in the abdomen of the bee, and the urinary organs into the *thinetarm* and thence in the *endtarm* is excreted. So therefore the question "How do the bees prepare wax?" is answered.

[P.S.—There is another article by the same author, "How do the bees build," which I may give you some other time. About the juices passing the walls of the stomach, see Prof. A. J. Cook, page 56. The two words which are underlined are not correct English, at least I think not, but I cannot render it better in the absence of a dictionary on entomology.—H. N.—October 3, 1887.]

GETTING BEES INTO SURPLUS CASES.

SEVERAL have wondered or asked why their bees did not occupy their surplus cases, they having difficulty in getting the bees to occupy the sections. This depends almost entirely on the apiarist. Proper management will induce nuclei to work in sections or strong colonies may be so managed that they will not put a pound of honey in sections, whereas with a little care and judgment in manipulating, from 25 to 75 pounds of comb-honey might be taken from the same colony. Too many frames in the brood-chamber simply means that it will be a long time before the bees will occupy the sections, if they do at all. Frames too far apart in the brood-chamber have the same effect. One of our prominent apiarists wrote us, a few years ago, that his bees would not occupy the sections early in the season. We told him to crowd the combs up closer together, just leaving sufficient space for the bees to work between combs; the crowding might be done by putting in division boards or extra combs. If the latter they should be brood-combs from other hives; one extra comb in six or eight is sufficient. The result was, after putting nine combs in place of eight, every colony so treated occupied the sections at once, others refusing until this was done. Seasons have much to do with this matter, but bees must be crowded in the brood-chamber before they will occupy the sections, and instead of waiting for them to fill their brood-chamber or get ready to occupy the sections, just crowd them at the commencement of the honey season, and every colony thus properly treated will go on storing honey irrespective of their strength. When the season for procuring honey is pretty well passed, and our colonies very strong, and the honey also coming in very slowly, the question arises—

HOW CAN WE EMPLOY OUR BEES TO ADVANTAGE?

There are many of us with too few surplus combs for extracting purposes, and also for hiving swarms on in the height of the season. Nice new combs just drawn out are a good investment, and the bees will soon empty the honey they have taken with them when they swarm and go to the fields for more instead of staying in the hive for two or three days drawing out foundation. New combs well drawn out will have sufficient honey in them in the height of the season, if the honey flow is good, before the foundation will be drawn out, to pay the full price for foundation. Now, those who wish to get a stock of surplus combs, without costing them anything, might do so by securing their foundation and placing it in strong

colonies, having it full drawn out and hung up in the bee-house for next summer's use. The interest on the foundation until next season would be only 3 cents per pound, and where wire is used one pound will fill either six or seven frames. Then when the colonies are placed on these combs, next summer enough honey will be placed in them to fully pay all this expense. We find that when the weather is warm a very short time only is necessary to have strong colonies prepared to hold all these combs. We sometimes leave them in two days, and sometimes one is sufficient, but we always place them between brood frames, crowding the combs up so close that bees may rest all their weight on the brood-combs while the foundation is being drawn out. This matter we have fully tested. Leaving the combs a sufficient distance from the foundation so the bees would cluster on it in order to draw it out where it would fall down to the bottom of the hive in less than an hour, if placed sufficiently close to the combs, would be nicely drawn out and it would not stretch enough that it could be noticed. Those who do not wish to use full sheets of foundation can put starters in and have them drawn out so that all preparations in this direction for another season may be made by the bees this fall. Should they build a little drone comb on the bottom of the starters it may be cut off. Putting comb in sections, or, in other words, sections filled with comb, or partially filled, placed over a colony of bees as soon as they are hived, without any comb below, is liable to cause the bees to put pollen in the sections, but if there is some comb below and a perforated metal and wood division board, this will prevent them from placing pollen in sections. Sections filled with comb put on before the honey flow starts are liable also to be filled with pollen, and some of our best comb-honey producers call them pollen-catchers or pollen-traps. Two supers may be placed on a hive, the one next to the board with foundation in the sections and one above with comb. In this way there is less liability of getting pollen in your sections. After the bees commence putting honey in sections those filled with comb are an advantage, providing it is snow white comb. If it has got soiled by age or being held too long for the bees to travel over, it should not be used, as the beautiful appearance of your comb-honey might be injured.—*Canadian Bee Journal.*

TREMBLING BEES—FOUL BROOD.

N. W. M'LAIN.

[We may state that Mr. M'Lain is carrying out experiments for the Entomological Department of the United States Government.]

THE "QUAKING DISEASE."

WHEN bees are unable to obtain from ordinary sources a supply of saline and alkaline aliment, indispensable to their health and vigour and to the normal performance of their functions, they seek a supply from any available source. At such times they throng upon the milk-weed and mullein, which exude a salty sap. At such times large numbers of dead bees may be found at the foot of the mullein stalks, and thousands perish in the fields, and thousands more which reach their hives, being low in vitality and unable to free themselves from the meshes of the silken fibre in which legs and wings are bound, die in the hive or crawl forth to perish. The action of these starved and weakened bees when attempting to rise and fly or to rid themselves from the mesh of silky web, causes a peculiar nervous motion, and this is one manifestation of that which is called the "quaking disease." If examined with a microscope, many are found entangled with the filaments from the plants, and their stomachs are entirely empty.

The honey from hives containing colonies so affected has a peculiar and very disagreeable taste and odour, somewhat like that of fermented honey, indicating that some constituent essential in conserving it was lacking, and the cell-caps are dark, smooth, and greasy in appearance, and an offensive odour is emitted from the hive. An analysis of honey taken from such colonies, made by

the Chemist of the Department, fails to reveal what element is lacking.

I have treated a number of apiaries so affected, using an application of strong brine, to which was added soda sufficient to make the alkaline taste faintly discernible. The hive should be opened, and each frame should be thoroughly dampened with spray from an atomizer, or the warm brine may be applied by using a sprinkler with very small holes in the rose, care being taken to use only enough to thoroughly dampen the bees and combs. The alighting-boards also should be thoroughly wet. The treatment should be applied morning and evening until the disorder disappears, which is usually in three or four days; a decided improvement being usually noticeable in twenty-four hours. The honey should be extracted and diluted by adding the brine, and, after being nearly heated to the boiling-point for ten minutes, may be safely fed to bees. The apiaries were last winter supplied with this food alone. Both wintered well. Vessels containing brine should always be kept in or near the apiary. Pieces of burnt bone or rotten wood should be kept in the vessels of brine, and these vessels should be protected from the rain.

Another form of the so-called "quaking disease" appears to result from hereditary causes; for, if the queen be removed from the colony in which the disorder prevails, and a young, vigorous queen be substituted, in due time the disorder disappears. In very rare instances bees also gather poisonous nectar from plants, such as fox-glove or digitalis, the eating of which, it is reported, results in paralysis, another manifestation of the so-called "nameless disease."

THE FOUL BROOD DISEASE.

One of the most malignant diseases incident to bees is called the "foul brood" disease. What pleuro-pneumonia and hog-cholera are to the dairyman and swine-breeder, foul brood is to the apiarist. This disease is so stealthy and so virulent and so widely distributed, no locality in the United States being assured of immunity, that much apprehension is felt, and some of the States have enacted laws having for their object its control and extirpation. In many States the ravages of this scourge have resulted in ruinous losses to beekeepers, and many on this account have been deterred from engaging in this profitable branch of husbandry.

During the past year I have given much attention to the study of this disease and the experiments for its prevention and cure. In making my investigations and experiments concerning the origin and nature of this disease and the means of its prevention and cure, I have collected a great amount of information from my own experience, and from the experience of many others. Concerning the origin of this disease and its means of communication, the evidence obtained is somewhat conflicting.

That the disease is actually contagious appears certain. That it is always communicated through the commonly accredited agencies is uncertain. That the disease is persistent and usually reproduces itself whenever the germs find the proper conditions for development is verified by experience. That the germs of this disease may be carried on the clothing of the apiarist and in and upon the bodies of bees from one apiary to another, and that they be borne by the wind from one hive to another in the same apiary, and that the disease germs may be liberated from the decomposing bodies of other insects and scattered over other objects with which the bees come in contact, seem probable.

That the disease is destructive to bees as well as brood; that live pollen is the medium through which the contagion is most commonly and most rapidly spread; and that the disease yields readily to treatment which is simple, cheap, and easily applied, appear to be true, in support of which I submit the following detailed account of my experiments and observations:

On June 1, an apiarist having over 200 colonies in his apiary reported to me that he had discovered two cases of malignant foul-brood, and that unmistakable evidences of its presence were apparent in 25 other colonies. As I knew this man was not without experience with this disease, I could not hope that he was mistaken. I knew that he

had had unenviable opportunities, having been a bee-keeper for many years where this disease had been prevalent, and two years ago he himself had consigned 148 colonies to the flames as incurable. I at once gave him the following formula for a remedy :

To 3 pints of soft water add 1 pint of dairy salt. Use an earthen vessel. Raise the temperature to 90° F. Stir till the salt is thoroughly dissolved. Add 1 pint of soft water boiling hot, in which has been dissolved 4 table-spoonful bicarbonate of soda. Stir thoroughly while adding to the mixture sufficient honey or syrup to make it quite sweet, but not enough to perceptibly thicken. To $\frac{1}{4}$ of an ounce of pure salicylic acid (the crystal) add alcohol sufficient to thoroughly cut it (about 1 ounce), and add this to the mixture while still warm, and when thoroughly stirred leave standing for two or three hours, when it becomes settled and clear.

Treatment.— Shake the bees from the combs and extract the honey as clearly as possible. Then thoroughly atomise the combs, blowing a spray of the mixture over and into the cells, using a large atomiser throwing a copious spray; then return the combs to the bees. Combs having considerable quantities of pollen should be melted into wax and the refuse burned. If there is no honey to be obtained in the fields, feed syrup or the honey which has just been extracted. If syrup is used, add 1 ounce of the remedy to each quart of the syrup fed. If the honey is used, add $2\frac{1}{2}$ ounces of the remedy to each quart of honey fed. The honey and syrup should be fed warm and the remedy thoroughly stirred in, and no more should be furnished than is consumed.

Give all the colonies in the apiary one copious application for the remedy, simply setting the frames apart so that they may be freely exposed to the spray. This treatment frequently reveals the presence of disease where it was not before possible to detect it. The quantity prescribed, applied by means of a large atomiser, is sufficient to treat 150 colonies. Continue the treatment by thoroughly and copiously spraying the diseased colonies at intervals of three days, simply setting the frames apart so as to direct the spray entirely over the combs and bees. In order to keep the bees from bringing in fresh pollen, burn old dry bones to an ash and pulverise in a mortar and sift through a fine wire-cloth sieve, and make a mixture of rye-flour and bone-flour, using three parts of rye-flour and one part of bone-flour, adding enough of the syrup or medicated honey to make a thick paste. Spread this paste over part of one side of a disinfected comb, pressing it into the cells with a stiff brush or a thin honey-knife, and hang this in the hive next to the brood. Continue this treatment until a cure is effected. Keep sweetened brine at all times accessible to the bees, and continue the use of the rye and bone-flour paste while the colonies are recuperating.

As a preventive apply the remedy in the form of a spray over the tops of the frames once every week until the disease has disappeared from the apiary.

On June 20, the apiarist above referred to reported as follows :

“Number of colonies in the apiary on June 1, 210. Number of colonies apparently diseased, 25. Treatment applied as directed to the whole apiary. Number of colonies actually diseased, 64. The disease present in all stages of progress; in some cases just appearing, in some well developed; in others the contents of the hives were a black mass, the brood combs nearly rotten, not an egg to be seen, and every cell of brood dead, and the stench from the hives nauseating. Have given the diseased colonies three applications, the first time extracting the honey. Effect of treatment instantaneous even upon apparently hopeless cases. Every colony save five is entirely free from any trace of disease, and these five are responding to treatment rapidly. I examined a colony to-day which two weeks ago had combs of brood almost rotten. No trace of the disease remains. I had 4,000 frames of extra comb. After having a few swarms, on some of them I found the disease present in every case. I then melted every one of these extra combs into wax, cleared and scalded and disinfected every hive, and hived the swarms on frames filled with comb-foundation. One of my neighbours, having an apiary of 60 colonies, had 38 cases of foul-brood, and before I was aware of it

he had burned up a number of them. The remainder were treated as directed. His yard is now entirely free from disease. The cost of the remedy was just 10 cents. This prescription, if thoroughly applied according to your directions, will speedily and effectually cure the most hopeless and forlorn case of foul-brood.”

It was afterwards found that the melting of the combs and scalding of the hives were not necessary.

After requesting this same apiarist to make some further tests, the nature of which will appear from what follows, on August 1 he made the following report :

“In five of my best colonies, which had shown no symptoms of disease, I placed frames of brood from diseased colonies, treating them as I did the diseased colonies, and all evidences of disease speedily disappeared. To one colony from which the bees had swarmed out, leaving less than half a pint of bees between the black, rotten combs and not an egg in the hive and every cell of uncapped brood dead, and not more than one bee hatching to every square inch of brood, after thoroughly applying the remedy I introduced a queen just crawling from the cell. To-day I take pleasure in exhibiting this colony as one of the finest I own, lacking only a sufficient store of honey, and this without the addition to the odorous hive and rotten combs of a single bee, cell, or brood, or anything whatever to assist except the young queen.

“I extracted the honey from diseased colonies and treated the combs of such with the remedy as directed, and then exchanged hives and combs, giving the infested hives and combs to the healthy bees without cleansing or disinfecting a hive, and the diseased bees were given the hive and combs lately occupied by the healthy colonies. The contagion did not spread, and after two or three applications of the remedy all traces of it disappeared. I fed back the honey extracted from the diseased colonies $2\frac{1}{2}$ ounces of the remedy to each quart; and I also fed the mixture of bone-ash, rye-flour, and honey as a substitute for pollen by pressing the paste into the cells on one side of a comb, and this I placed next to the brood in each hive. I would not advise any one to feed this bone-flour and rye-flour paste unless they wish to rear a great many bees. I also fed the salt, alkali and acid mixture outside in the apiary, so that all the colonies could help themselves. No; I do not fear that any of the mixture will be stored for winter to get into the surplus apartment, as the bees seem determined to use all they can get of it in brood-rearing. All my hives are running over with bees ready for the fall honey harvest.

“As requested, I placed frames of sealed honey from diseased colonies in healthy colonies, and the disease was not communicated; but the frames from which the honey had been extracted, such as contained pollen, uniformly carried with them the contagion, unless the combs were first thoroughly sprayed with the antidote, and colonies gathering no pollen, or but little pollen, recovered much sooner than those gathering pollen in considerable quantities—that is to say, the more pollen, the more treatment required.

“In reply to your question asking by what means and in what manner the disease was communicated to my apiary, I answer: I at first thought that it had originated spontaneously, but later and more careful inquiry leads me to believe that I introduced it into my apiary through my own carelessness. But I and my neighbour (to whom reference was made in a former report) spent a day in some apiaries some distance from home in which the disease was raging. It would seem true that we brought the contagion home in our clothing. Other apiarists in our country who kept away from the contagion had no trouble. As to the progress of the disease in individual colonies, I would say that three or four weeks from the time the first cells of diseased brood are noticeable is sufficient to complete the ruin beyond redemption. I am surprised to hear that in some localities a colony may be affected for three or four months before ruin is complete. I have succeeded in rearing some queens from one of these diseased colonies, treated with the remedy without removing the comb-frames, and I will give them every possible chance to reproduce and propagate the disease. I have no fears of a return of the disease where the treatment has been thorough.”

2. Number of colonies in the apiary, 14. Every colony nearly ruined by the disease in most malignant form. This apiary is located on the same ground where 145 colonies perished last year from the same cause. The whole yard had been swept clean, everything had been burnt up, and entirely new stock procured. Twelve colonies in this apiary were treated by copious and thorough applications of the remedy, simply by setting the frames apart in the hives so that the spray could be directed over both sides. The frames containing brood were not removed from the hive, neither was the honey extracted. The treatment was applied every three or four days, and in three weeks the colonies were free from all appearance of disease. The other two colonies were treated with what is known as "the coffee cure," finely ground coffee being used as an antiseptic. The coffee failed to furnish any relief. Being dusted over and into the cells, it killed the little remaining unsealed brood. The salt, alkali, and acid remedy being applied, these two colonies also rallied, and "everything is all right now," was the last report.

3. Number of colonies, 100. Number apparently diseased, 48. A number of colonies had already been burned when the disease was reported. The remedy was thoroughly applied as directed, and in fifteen days the contagion had disappeared.

All the evidence so far obtained seems to prove that pollen is the medium through which the contagion is commonly introduced into the hive, and by which it is communicated to both bees and brood.

The bacteria, "the disease germs," having been lately deposited on the pollen (from what source is not positively known, but probably from the decomposing bodies of other insects) before the organisms are washed from the blossoms by the heat of the sun, as they lie exposed to his rays without any element essential to their culture and growth, are carried and stored with the pollen in the cell, or pass into the digestive system along with the live pollen taken by the bees for their own nourishment. By this means these agents of destruction are introduced into the organism of the bees, and through the same medium are they introduced into the cells of the uncapped larvæ. The bacteria, having found a lodgment in the organism of the bee, may or may not cause speedy death. If the bees are young and vigorous they may resist the ravages of the infection, yielding only after the organism is riddled with the bacteria, but if the bees are old and low in vitality, the infection, if left to itself, brings speedy ruin. In the spring of the year I have dissected bees which had passed the winter in a colony in which this disease was present when the bees were put away in winter quarters the fall before. Their bodies had been completely honeycombed by bacteria.

The fact that a diseased colony is removed from the infested combs and hive, and placed in an empty hive or in a hive with frames supplied with comb foundation, even if the new hive be at once placed on the old location and the old hive and infested combs be burned and the bees at once liberated, the disease commonly disappears, seems also to furnish additional proof that the contagion is usually carried into the hive in the pollen, and, further, that the "disease germs" do not long retain their virility if exposed to the rain and rays of the sun; otherwise the bees would continue to carry in the infection. The bees being compelled to consume the contents of their honey-sacs in building new combs, none of the germs remain to be regurgitated in the new cells; but by this practice the bees are left to the tender mercies of the bacteria, unless they be treated with an antidote. For obvious reasons the queens in such colonies should in any event be superseded as soon as possible. This method of treatment also contemplates the destruction or renovation of all hives and frames, the destruction of all brood, and the melting of all combs; a large percentage of the capital in honey-producing.

Another reason for believing that, except in rare cases, the disease is introduced by pollen is found in the fact that the larvæ rarely ever exhibit any symptoms of disease until about the time when the process of weaning begins, at which time the character of the food is changed from the glandular secretion, the pap, to the partially digested and undigested food. Live pollen is then added

to the larval food, and with the bacteria in greater or less numbers; growth is arrested; death ensues; putrefaction follows, and the soft pulp, of a grayish-brown colour, settles to the lower side of the cell. As the mass dries up it becomes glutinous and stringy and reddish-brown in colour and emits an offensive odour. Some of the larvæ will be partially capped, some completely capped and some left uncapped, the condition in which the brood is left depending, I believe, upon the virulence with which the disease attacks both bees and brood. The remedies prescribed appear to destroy the bacteria and cure the bees of the contagion and restore them to natural vigour. The worker bees then cleanse the hive of dead bees and brood and clean out and renovate the cells, and the colony resumes its normal condition.

That the contagion may sometimes be borne from hive to hive by the wind appears to be true, as it was observed in one of the apiaries which I treated for this disease during the past summer, that of a large number of diseased colonies in the apiary, with the exception of two colonies, all were located to the north-east of the colony in which the disease first appeared. The prevailing wind had been from the south-west.

That the disease germs may be carried upon the clothing and hands appears probable, from the fact that in one neighbourhood the disease appeared in only two apiaries, the owners of which had spent some time working among diseased colonies at some distance from home, while other apiarists in that locality who had kept away from the contagion had no trouble from foul-brood.

(Official report to United States Government.)

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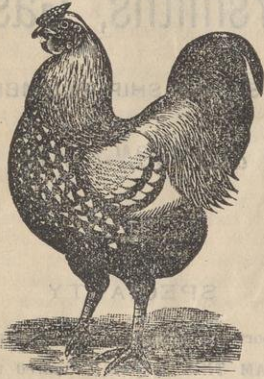
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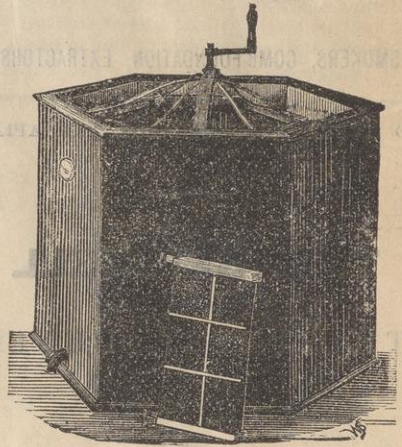
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