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West Maitland, N.S.W.: E. Tipper, September 30, 1911

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THE AUSTRALIAN Bee Bulletin.

A MONTHLY JOURNAL, DEVOTED TO BEE-KEEPING.
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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, 1911.

EDITORIAL.

The weather has been very changeable during the month but the bees have stood it very well, there being plenty young bees hatched and daily hatching. In fine days drones are now flying in galore, and the queen rearing is going on nicely. This season's rearings should surpass the last for purity as a party, who kept a considerable number of hives less than a mile from my farm, has lately shifted to fresh fields and with the exception of a hive or two here and there I am now in possession of the locality, which should prove of considerable benefit to customers, as there is no more trouble to rear a queen whether fertilised by a pure drone or another. If we had control over the mating, our difficulty would be much less. During the last few seasons I experienced considerable trouble owing to the proximity of inferior drones.

Indications predict a fair amount of swarms, as also a fair prospect of a good honey crop. I like some natural swarms, they indicate prosperity, and swarms generally surpass old stocks in activity; absolutely non-swarming bees are not in my favour. With black and inferior hybrids it is different, these incline too much to swarming and spoil the harvest, but this does not apply to the pure Italians.

In last issue Mr. Branch raises matters of considerable importance affecting not only exhibitors at the shows, but the management thereof, and as he is not an exhibitor but has seen the show yearly, and even acted as steward and judge, his expressions of opinion must be taken as disinterested and observant.

To make you, readers, fully understand the affair, I will now give you an outline.

The bee and honey section was inaugurated in 1888, when the society offered seven special prizes, six of which were awarded to my exhibits. The society continued to offer prizes and increased them in number as the exhibits increased. Then Messrs. A. Hordern also donated a special prize every year, everyone of which I obtained.

It was soon found that this interesting section needed better accommodation, and the government was approached by beekeepers. Mr. Albert Gale being the most instrumental party on the subject, the result was that £75 was granted the society to build a pavilion for bees and honey exhibits, and it was built at a cost of about £150.

In 1902 the government offered a special grant of £25 for this section in addition to the society's prizes. The committee of the then beekeepers association—of which I was a member—pro-

posed to offer one big prize of £25 for the best trophy collection. Up to then there were two prizes in each class, but only one in the trophy class, so that here one scooped the pool, while the other exhibitors in the class got nix.

I then proposed that instead of one big prize there should be three prizes, namely:—Champion, £15 (which included first prize); second, £7; and third, £3. This was agreed to. I won the Champion and First Prize, and though my alteration meant to me a loss of £10, I was not sorry, but pleased, to find that my foresight enabled other competitors to be compensated for their trouble and expense.

Though the government did not repeat the donation the society continued to provide three prizes. £7 for first. I then approached the secretary of the R.A.S. and proposed that there should be three prizes in all the classes, and that the trophy prize be increased to £10, £5 and £2 10. These suggestions were agreed to willingly, on my pointing out the considerable expenses exhibitors had to place their attractive exhibits. This might convince you that my aim has always been to advance the industry generally, not particularly.

But while every opportunity was offered by the society very few outside the metropolitan area availed themselves of it to exhibit their products. This is not the fault of the society.

The sectional management may not have been perfect, and this I also pointed out to the officials, but without result.

Mr. Branch gives some facts which intending exhibitors and others may study and diegst, and if they will come forward with suggestions, some good should result. It must be born in mind that the Council of the R.A.S. are not all beekeepers, and cannot be versed in all the numerous sections, thus suggestions have to be made by those who know, and the Council should be likely to accept them as guidance. The question is: Who guides and regulates the process? Mr. Branch says what he thinks about it. The question then arises: In what direction should change be made? It is for beekeepers to answer. No doubt after full representation of desirable suggestions the society would carefully consider them and adopt the best.

Mr. Branch touches another point, namely: The lust for selling. This is a nut which is cracked in many sections besides the bee and honey sections. When I began to exhibit I did not sell a single bottle, though it was often asked for, but a few years after I noticed that other exhibitors had nearly sold out their trophy exhibits; I actually had sold mine too, but to be delivered to a firm after the show. I then decided to do as others did, and it so happened that next year I practically sold out at the show, while other exhibitors did not get sufficient patronage to materially reduce their exhibits. This continued year after year. As a result the disappointed made complaints to the society against my selling from the exhibit. Did they find it out then that it was wrong to sell? Or was it not for some other obvious reason? Be that as it may the sale of honey is now an established fact, the visitors want it and it would be bad policy to disappoint them. Furthermore the exhibits would be hardly as elaborate if no sale was permitted. Then again, the show seems the best place to introduce our honey to the public. Here it is displayed in its best quality and to advantage, and visitors cannot resist the temptation to try some. I know for a fact that many look for my exhibit and to get some, as they say they cannot buy equal in the ordinary way. Against this it may be said that visitors who come on the last day or two of the show are de-

barred from seeing the exhibits in the form as on judging day, and that to them it might appear that the champion trophy looks then inferior to others While this might be true to those who have knowledge of the subject, I doubt if the general public cares. My view is to supply all who are in quest of honey, and at every opportunity you have to gain customers for our product. The public make a demand,—what other suggestions can you suggest? Besides the society's aim is that exhibits be sold. But how can the honey exhibit be sold by the producer to the consumer when the show is over.

In this connection another point may be mentioned. Several exhibitors are supplying the city trade. To them it is immaterial how much of their exhibit is left over, they can use this for the trade. Not so the exhibitor who lives some distance from the city, he has to take it back, where it is unsuited for his customers owing to the package it is in, or he has to take any offer he can get in the city. Should such not be aided rather than retorted.

Another matter in said article is to be noted—the sanctions of a non-competitive" trophy to be run by one of its sub-officials. Now, this would not appear so much out of the ordinary if such exhibitor were a beekeeper and made a living by bees as I do. But as it is it opens the door to all and sundry to come along, and for this purpose the pavilion was not built. Or has officialdom priviliges? I have brought this subject before the secretary and council of the R.A.S., but no alteration took place. The society knows or should know their business; but it may be within your recollection how I was treated some time ago, but terminated the matter to my advantage. This may have left soreness elsewhere, and thus it is up to you to rectify matters if they need alteration. I have done my share, but am willing to assist further. In any case, it would seem better if an exhibitor did not hold office in the same section; let it be either one or the other, even if he is a bonifide beekeeper. Much more might be said but the foregoing will do for the present.

W. ABRAM.

DO BEES CARRY EGGS?

I have noticed this question under discussion for some time, and gave it only a casual glance for the reason that if the bees carry eggs to a more convenient place for the construction of a queen-cell according to their notion, why, good and well. If they do not, good and well, also. It is not a matter of dollars and cents to me in either case, so far as I know, for if my bees become queenless and have no egg from which they can rear a queen they die. They cannot go, as I know of, to some other hive and steal an egg—at least, I have never caught my bees performing such tricks.

This question was brought to my attention in the March issue of the "American Bee Journal" in the Editorial page, in which Mr. W. Abram, of Australia, says that the egg is glued to the bottom of the cell, which is true, and when once removed the bees have no way of sticking it back again into any other cell. Just here I wonder if Mr. Abram ever studied adhersion, or capillary attraction, or run across anything like that in his physics while at school! The question is easily settled, for a very small amount of honey or chyle at the base of the cell will hold the egg very securely, or little larva, as to that matter.

I am very much of the opinion that the bees often move either the egg or the larva to a more convenient place, for time and again have I seen evidence to this effect in rearing queens. All

practical beekeepers who have ever reared queens know full well how bees love to construct cells along the rough or jagged edges of combs, or at the bottom of the frame. It is at these places that I have evidence in great abundance to believe that the bees move either the eggs or the larva, and preferably the latter.

On the 15th of this month (March) I dequeened 13 colonies of bees to construct queen-cells for me, and went back the 17th—48 hours later—to graft the cells started by the bees. There were two instances, or 2 hives, that showed that larva had been moved. One was at the bottom of the frame, the other at the jagged end of a frame of comb. In both cases the queen had left off laying about one inch between the egg radius and where the cells were located. In each case there were nearly a dozen cells started very close together. As they were one inch from the egg-line I did not expect to find any cell with a larva in it, but to my surprise I found one cell with a tiny larva, and well fed; all the rest were empty. This was hive No. 1.

Hive No. 2 was just a little more advanced with its cells, and the bottom of the comb above the bottom bar of the frame, as the bees never quite built to the bottom bar—the queen stopped off laying about one inch above the bottom of the comb on both sides. I did not expect to find a thing in these stumps of cells, but to my astonishment I found a larva in one that was just about a day old, and well fed. I am very much of the opinion that the bees meant to rear two other cells that were fed, but had no egg or larva in them. I grafted the cells and forgot about the matter.

Now these cells that were fed would hold either Mr. Abram's egg, or larva, for they surely very cleverly held the larva that I put in them. I have seen this many times in queen rearing experiences, but never as much as gave it a passing notice. The queen could have laid these eggs just where I found them, but hardly just at this time when they have no notion of swarming.

It is very evident to me that either the queen lays eggs in the queen-cells or that the bees move them there, for last spring I found dozens of them in queen-cells during a swarming epidemic that I had never had the like in ten years.—T. P. Robinson in "American Bee Journal."

As the "Australian B. K." reprints a matter in which my name appears, I republish the same as above, and now make a short remark thereto.

Statements in public, be it in speech or writing, are open for criticism. The critic has to disprove the statements subjected to criticism, otherwise the public may decide in their own mind. Mr. Robinson undertakes to dispute the correctness of what I said in the 'A.B.B' Do Bees Transfer Eggs? but he comes straight into my camp, in fact gives his whole show away in his opening paragraph. And then he has the cheek to ask me some school questions, but he overlooked the fact that I stated that the shell of the egg breaks on removal from its original deposition. How does Mr. Robinson remedy that defect. No one has yet proved my contentions to be wrong. Why not! His further arguments are not worthy of notice, he simply neglects to observe properly what goes on in the bee hive. Study his last paragraph, and if you do not grasp the stupidity of it all I have no time to waste to enlighten further at present.

W. ABRAM,
Ed. "A.B.B."

H.B., New Zealand, writes:—Last year we did not get any surplus honey owing to drought. Though in some parts of N.Z., there was more rain and a good flow from clover. This season

the locality was favoured with more rain so we had a steady flow of honey from the beginning of November till the end of March. When we are quite finished extracting we will have taken about 20 tons extracted and five tons comb honey in extracting combs, the comb honey being very dark, as it was gathered off the N.Z. flax, will be used for spring feeding and increase. The flax is a heavy honey producer, occasionally for years at a time the bees do not gather honey from it, but when it does secret honey the long trumpet shaped flowers overflow with nectar at such a time anyone shaking the tall stems would get quite a shower bath. We opened in the spring with about 400 colonies, and have increased to about 700. Our bees are divided into eight aparies, we expect to add two or three more to the number. The farthest out-apiary is thirteen miles away from home, we have however, a four-roomed cottage there which enables us to stop overnight when extracting or other times when necessary. We have several other apiaries which we work from that centre. Four years ago we ordered a eight-combed extractor with engine, this extractor was fitted with a Holdermann strainer and heater, we also imported a honey pump with it. After breaking the pump several times, that is at least half-a-dozen times, we have given up the idea at present of pumping honey, even when the honey was well heated it would not pump, the pump breaking every time. We consider the motor extractor just splendid and would not be without it. We have lately added to our plant a steam heater uncapping knife which is a great success. Hoping to hear something from the Australian beekeepers.

CONTROLLING SWARMING.

By J. Tinsley, Expert (First Class) B.B.K.A., and Lecturer, Stone, Staffs.

One of the most perplexing problems the beekeeper is called upon to solve is the prevention of swarming. If swarming could be eliminated, beekeeping would certainly be more delightful and less difficult. There are several methods advocated by which swarming can be entirely prevented, or reduced to a minimum. The success of each plan depends to a great extent upon the experience of the apiarian.

Clipping of Queen's Wings. This practice emanated from America, where beekeeping is carried on more extensively than in this country. The object is to prevent the queen from leading off a swarm from the hive. A search is made for her, and while she is in the act of walking over the comb the operator cuts a small portion off the top of each of her wings with a sharp pair of scissors. A skilful expert can pick the queen up between his thumb and finger, and perform the work with expediency, but to a less experienced beeman it would probably result in crushing the queen's ovaries, and incalculable harm would ensue. Clipping the wings prevents the queen soaring off in the future,heading a runaway swarm. She will simply roll off the alighting board immediately she attempts to utilise her wings. An inspection of the ground in front of the hive will reveal the queen in the centre of a little cluster of bees. The swarm naturally return back to its home. This plan, while not actually preventing swarming, guards against the swarm being lost. This method is particularly valuable to the beekeeper who is away from home the greater part of the day and returns at night. It is a simple matter to make an inspection of the brood chamber and prevent the swarm re-issuing.

Keeping Young Queens.—Another method to prevent swarms issuing is to keep all colonies headed with young queens. Old ones are responsible to a great extent for encouraging swarming. Stocks headed by these queens very rarely build up into honey gathering strength until the season is half over, and before the beekeeper is aware of their state, preparation for swarming sets in. On the other hand, colonies with young queens at the head of affairs, build into flourishing stocks previous to the honey flow, and settle down to work right merrily.

Rearing Queens from Non-swarming Colonies.—Beekeepers will have noticed that certain stocks in the apiary make provision to swarm year after year, while others on the contrary very rarely endeavour to do so, rewarding the beekeeper at the end of the season with weighty supers. It is from the latter stocks that the beekeeper should rear his queens. He will by this method be able to re-model his apiary with almost a non-swarming strain of bees. The introduction of Carniolan queens often leads to excessive swarming.

Brood Chamber Examination.—The beekeeper should adopt a proper system of overhauling the stocks for queen cells. Swarms generally issue on the ninth day from the laying of the egg. If the apiarian will make a point of examining his colonies every eight or nine days and destroy all queen cells in the course of formation, it will frustrate their object. Each frame will require careful examination, particular attention being directed towards the sides and bottoms of the combs. Should there be no sign of swarming in any particular hive a note should be made of the same and fixed in the roof. This will form a useful guide in future examinations. It must not be taken for granted that by simply cutting out the royal cells no furher inspection will be required. On the contrary such a colony will require more watching than one which shows no swarming symptoms. Should the second inspection reveal more cells, the following course should be adopted:—Procure another brood chamber and fit it with frames having foundation wired in same. Overhaul the combs and destroy the second batch of queen cells. Take the frame upon which the queen is found and insert it in the new chamber. Raise the stock box and place it over the new chamber, placing a queen exclude between. As the brood hatches out in the top chamber honey will take its place, while the frames of foundation in the lower body will be utilised by the queen as quickly as they are drawn out. Additional supers will be required and swarming in this colony will be over. Another excellent method in the case of a stock that is persistent in its swarming fever is to make a nuclues with the queen, so that the first virgin that comes to maturity will be necessary to take charge of the colony.

Giving Room in Advance.—This is a wise precaution to obviate swarming. It often happens that some days furnish large gluts of nectar, and if the bees are handicapped for room in which to store it, no amount of space given afterwards will prevent their swarming. When a honey chamber is half filled another should be placed on the top. Even if the beekeeper is a little early it will act as a safety valve and at all events be useful for ventilating purposes.—"Irish Bee

A CURIOUS INCIDENT.

I have taken the enclosed cutting from to-day's "Scotsman":—

Fort William, N.B.,
May 27, 1911.

Sir,—I was very much struck while walking through the policies of a small estate in this neighborhood to observe dozens of bees lying dead beneath and around an ordinary geen tree. It was

only under this particular tree that these apparently, victims of experiments were to be found. It looked as if they had been poisoned by whatever t hey had extracted from the blossom, for the tree was in full flower.

I looked carefully under many of the neighboring trees and shrubs, of which there are a great variety on this particular estate, but in no case could I discover a single corpse. The deadly evil to the bees seemed to be centred in the apparently innocent geen tree, for it was under it alone that the dead were to be found.

Being at a loss to account for this, I venture to intrude this letter in your columns in the hope one of your contributors to your delightful "Nature Notes" may be able to throw some light upon the mystery.—I am, &c.,

Mystified.

The wild cherry is frequently literally covered with bees in this place, but I have never seen a case such as described by the writer.

It surely has been a "battle royal" from some cause that caused such destruction to life.—A Daviot.

[We have seen the wild cherry (geen tree) frequently visited by bees, but have never observed them affected by it in any way. We have, however, seen wild bees affected by lime blossoms, and hundreds of them were lying dead under the lime trees last year.—ED. "B.B.K."

[Died from disease—probably Nosema apis.—W. A., ED. "AB.B."]

HONEY IMPORTS.

The value of honey imported into the United Kingdom during the month of May, 1911, was £4,542.—From a return furnished to the "British Bee Journal" by the Statistical Office, H. M. Customs.

EMBEDDING WIRE BY ELECTRICITY.

By John Warnock, Glasnevin.

The following method of embedding the wire in foundation may be of interest.

The frames are wired in the usual way, but a short length of wire is left when cutting off after twisting round the tacks. The foundation is next fixed and the frames thus prepared is laid on the wiring board **with the wires underneath.** Two wires are now taken from the terminals of a 4-volt accumulator, such as is used for ignition purposes in motor-cars, etc. One of these wires is hooked into the wire on the frame where it passes on the outside of the side piece; the other wire from battery is now held with one hand in contact with one of the loose ends of frame wire. The current of electricity which pass through the portion of the frame wire connecting the battery wires, heats this portion, and a gentle pressure on the wire to sink into the wax, leaving behind scarce a mark to show where it entered. When the wire shows through the bottoms of the cells on the upper side, the battery wire is freed from contact with the frame wire at tack, and the other strand is treated similarly.

I had the pleasure of demonstrating this method, on the invitation of my friend, Mr. Tweedy, at the recent meeting of the Kingstown Beekeepers' Association, and it met with the unanimous approval of those present.

The putting into circuit of a switch, which can be pressed by the foot, greatly facilitates the operation by leaving both hands free. This switch can easily be made by mounting an ordinary bell-push on a small block of wood.

BEES IN PARLIAMENT.

The following answer was given by the Parliamentary Secretary of the Board of Agriculture and Fisheries, in reply to an inquiry by the Member for West Perthshire, which will show that the subject of bee disease is receiving attention:—

Sir E. Strachey informed the Marquis of Tullibardine (U.) that if the investigations now in progress indicated that legislation was required in order to prevent the spread of bee disease in Great Britain, the Board of Agriculture would at once bring in a Bill for that purpose. —"B.B.J."

AN AMATEUR'S FIRST YEAR.

By R. J. Ruliffson.

For several years I felt that I had latent somewhere in my system those germs which, if given proper culture, would produce a distressing case of bee fever; and during the summer of 1909 these same germs began to multiply so rapidly that, on the 12th of August of that year, I bought a five frame nucleus of Italian bees with a select tested queen. This locality is an exceptionally good one for flowers, flowering shrubs, clover, linden, and for locust and sweet clover.

The nucleus arrived with apparently no loss of bees in transit, and was duly installed at sunset on the day of its arrival. This was about the last of the honey-flow from basswood here; but sweet clover came on in great profusion, and by September 20, or thereabout, these bees had drawn out the foundation in the remaining five frames, and had become a full-sized colony.

The fall was an unusually dry and hot one; but I could have secured a small amount of surplus from buckwheat and aster. However, I let the bees fill their hive to overflowing; in fact, they went so far as to build many bridges of wax between the brood-frames that they filled with honey. Late in October I built a cover out of ⅞ matched boards to slip down over the hive for winter protection. I did no know enough to provide a chaff cover, as I think I would now do; but over the frame was a piece of oil-cloth, and over that the regular cover. This constituted the only protection afforded the colony; but during the winter and spring I found less than fifty dead bees; and these represented nearly all there were, as their hive at all times was as clean as a dining-table.

On March 10 a neighbour (a florist) complained to me that the bees were ruining the lilac, genista, rambler rose, and other flowers which he was holding back for Easter trade. I went over to his greenhouses with him, and found bees in such numbers that they made the rambler blossoms look like a balled queen. There were quantities of black and hybrid bees there also; but as I lived next door, my bees were charged with all the damage. Later in the day, after the sun had gone down, my neighbour began to cool off to such an extent that he was perfectly agreeable to an arrangement whereby my bees could be closed in until Easter. I accordingly put my bees in the cellar. During the period of confinement there were warm days when I believe I felt worse than the bees in their mad attempt to get out after pollen; but I managed to relieve temporarily their desire to get through the wire netting by sprinkling water on it. The Saturday before Easter, I put them out on the old stand, at which time there was pussy-willows in bloom, and these, with the soft maples, were sufficient to keep the bees out of the greenhouse.

On one of the nice warm days in April I decided to clip the queen. There was very little choice in surgical instruments, as I had nothing between my wife's manicure scissors and the axe, so I chose the former with its curved blades, and, taking the smoker (I do not use veil or gloves at any time), I started in on this very uncertain undertaking. I discovered the queen on one of the centre frames, and at each attempt to get hold of her I failed. Finally, however, I got her between my thumb and index finger. I do not believe my first trip in an airship could be half as nerve-racking as the fear that I would squeeze her too tight and permanently injure her. At the same time, I wanted to clip off enough of the wing-bow and yet not cut too close to the body. I finally decided that I would cut off only the bow part of the wing, which I did, and I felt relieved when I saw her scamper off as she was

put back on the brood-frame. The hive was literally alive with bees, and packed with brood and honey.

On May 16, at about 11.30 a.m. I received a phone message that the bees were going away, and to come at once. My office is within 200 feet of the house, and I am convinced that I did not take more than ten steps to get there. I had previously given careful and frequent instructions to those at home what to do in case of swarming; but the excitement had been too great, and I found the queen was in a neighbour's wife's hands trying to get out between her fingers, where she (the queen) had been shifted from the hands of my wife to allow her to bring out the new hive. I actually believe that, had I not arrived as I did, they would have put the ash-box on the old location instead of the new hive. I was not as cool as an ice-chest, but I took advantage of the demoralization and put things aright. The swarm clustered low; and to hasten the return of them to the hive we shook the bees into an apron and dumped them in front of the new hive, and then released the queen. They were all in at 1 p.m.

Just nine days later I examined the swarm and found every one of the ten full sheets of foundation drawn out so that one could hardly get a lead-pencil between. Owing to unfavourable weather conditions it was not until June 10 that I put on an extracting-super to bait the bees above. I left it on for three days, at the end of which period the bees had built out all the foundation nearly two-thirds, and had stored some honey. I then raised the extracting-super and placed a super of section boxes beneath. One day later I put a bee escape board between and then removed the extracting-super. By the 24th of June it became necessary to put on the second super, as the first one was entirely filled, including the outside row, and three or four rows of cells in each section were capped.

The old hive, the second day after the swarm issued, was divided into two five-frame nuclei, the frames being so arranged that each nucleus had five or six queen-cells and an equal share of brood and stores. This division was made for increase, and also prevented after-swarming. On the 24th of June these nuclei were carefully examined, and in each the five additional full sheets of foundation had been fully drawn out and filled with brood, and both hives were as strong as full colonies, each queen rivaling her mother in colour, size, and prolificness. Both colonies were ready for supers at the last end of the clover-honey flow, with basswood and sweet clover following.

My knowledge of nature has increased fourfold since keeping bees, because my interest is drawn toward those plants which furnish the existence for those creatures that are born, not for evil, but for good.—"Gleanings."

SEASONABLE HINTS.

REMOVAL OF TOP BOXES.

All top boxes which have been left on the hives up to the present may be removed at any time now, when the colonies have been so far reduced in size as to be comfortably domiciled in the lower box, that is, the brood chamber. In any case, they should be removed as early as possible, as in the ordinary course of things, breeding, except in the very coldest parts of the Dominion, will commence about the middle of July, if the bees are covered down snugly and warmly without much cold-air space around them.

It frequently happens that the bees desert the lower box during the cold weather and settle in the upper one, when this has been left on till July or as

late as August, as is sometimes the case with negligent beekeepers. When a colony has been very much reduced, or breeding is about to commence, it is natural for the bees to seek to warmest part of the hive, which, of course, is the upper part, where the warmest air is located. In such cases it is well to leave the bees there and remove the lower box instead, always seeing that there is a good supply of food remaining in whichever part of the hive the bees are left.

THE FOOD SUPPLY.

It will be found on going through the hives, that very little food has been consumed since the bees were fixed up for the winter, so that there should be still most of the winter stores remaining. When removing the spare boxes and rearranging the frames of honey, take care not to place large slabs of honey in the centre of the brood chamber. The two or three centre frames will be required almost immediately for brood-rearing, and for this purpose they should contain but very little food. Slabs of honey are very cold, and if placed where the space is required for breeding purposes, the bees are given the unnecessary trouble of removing the honey to another part of the hive; always place frames of honey at this time more towards the sides of the brood chambers.

DIVISION BOARDS AND MATS.

As may be readily understood, warmth is the great factor to induce breeding, a sufficient supply of food being granted. A colony reduced much below its normal strength in July could not keep up the temperature of the whole brood-chambers high enough to start early breeding, which is essential to its welfare. Means must then be taken to reduce the size of the brood-chamber, commensurate with the size of the colony by placing division boards on each side, and close up to the cluster of bees. Supposing the bees when closely clustered on a cool evening to occupy only three or four frames, then division boards should be used to contract the space. Two frames must be removed, one from each side, to make room for them, and the remainder of the frames can be placed at the sides of the chamber.

Division boards can be readily made by cutting a dry 9 x 1 inch board into lengths that will just nicely fit a hive from front to back, the same way the frames run. They may be cut a trifle shorter to allow of a piece of old carpet or felt being nailed up each end to make them fit well against the front and back walls of the hive. A three-eighth inch thick top-bar, one inch wide, the length of an ordinary top-bar, must be nailed on one edge so as to suspend the division board from the rabbits in the same way as an ordinary frame; it should then hang clear at the lower part about a quarter of an inch from the bottom board.

An extra mat, say three in all, should be put over the frames, and they should be well-fitted to conserve the warmth of the bees.

VENTILATION.

It is a common idea among novices in beekeeping that a small entrance to the hive in winter is conducive to the warmth of the interior, whether that is so or not, it is certainly not conducive to the health of the bees. All the ventilation of a hive is conducted by the bees in their own fashion—through the entrance—and if this is obstructed in any way by being made too small, the bees suffer. The interior atmosphere becomes too damp, with the result of mouldy combs and sour food with attendant dysentery.

BEE DISEASES INVESTIGATION.

MR. W. LAIDLOW, F.L.S., B.Sc.
Biologist, Department of Agriculture.

The investigation of the diseases affecting the bee presents many difficulties; we cannot like the physician or surgeon question our patient about its family history; we cannot ask whether it is suffering from pain in its head or its heels, or somewhere between the two; we cannot feel its pulse, and though we can examine its tongue, such examination reveals nothing as to the state of the digestive tract. We cannot percuss the different organs, and if we did try I am afraid our patient would resist so stoutly that we would be glad to give up our attempt.

Another thing, we have a serious handicap in not being able to observe the bees in their natural surroundings. When we receive the bees for examination they have usually been caged for two days at least, and that is quite long enough to render the intestinal contents abnormal. I believe more good could be done in one month if we could establish a small working laboratory in an apairy with one of you to point out the bees that depart in any way from the normal than can be done in a year with caged bees.

I wish to emphasize another point: I have received a number of bees which had been caged immediately they left the brood cell. Now, I am trying to help you and your industry by experiments, which require a great deal of time and considerable amount of care in carrying them out, and I consider it very unfair to receive bees so young that they are not of the slightest use in this investigation. It is unfair also to those who have been helping by sending bees which they believed were abnormal. You can all help me, and in so doing help yourselves, by sending bees which in some way depart from the normal, giving me at the same time a short note concerning the symptoms observed.

After stating these difficulties in the investigation of the diseases affecting the bee, we will now turn to the different points to be considered in the study of any disease.

In the first place we must look for a cause: In the diseases of man and the higher animals comparatively little is known of the causation of disease, and in the diseases of bees there is less. Every year and every day adds to our knowledge; only yesterday Dr. Brown told us the cause of paralysis in the bee. It is usual to divide the causes of disease into predisposing and exciting.

Under predisposing causes we have various thing to consider, such as age, sex, race, heredity, climate, etc.; and under exciting causes: food and micro-organisms.

Age.

Foul brood attacks the larvae only while paralysis is a disease of the mature bee.

Sex.

The drones are less affected than the workers with American foul brood.

Race.

It is quite probable race plays a part in bee diseases, and it has been pointed out to me that the "pretty" races are more liable to paralysis.

Heredity.

According to American observers heredity plays an important part in the so-called "pickled brood."

Climate.

We know that with man and the lower animals we have climatic diseases, and it is quite reasonable to suppose climate will play quite as an important part in the diseases of the bee.

We come now to the exciting causes, food and micro-oganisms: Dysentry is believed by many to be caused by the

character of the food. We know that watery honey tends to ferment easily, and this fermentation may give rise to digestive troubles in the bee. Many plants produce poisonous fruits, and we may infer that the nectar and pollen produced by some of them is also poisonous. It may be that the continual removal of honey from the hives causes the bees to seek nectar and pollen from plants which in their normal state they would leave severely alone. A systematic study of the flowers of plants to ascertain their value to the beekeeper and to find out whether any of them contain any toxic substances would, I believe, be of great value to your industry.

We come now to micro-oganisms as exciting causes of disease. These are living plants and animals that are so small that they must be highly-magnified before they can be seen at all. Some bacteria indeed are so minute that they are ultra-microscopic in size; by ultra-microscopic we mean that they are not revealed even by the highest powers of the microscope. Some of you may ask how we know such things exist. Well, we can take a fluid containing ultra-microscopic disease germs and produce disease in an animal, and we can take another portion of the fluid and filter it through a fine porcelain filter, which will remove all the germs and render the fluid quite innocuous when injected into another animal.

Bacteria, protozoa and fungi are the micro-organisms which cause disease, and of these the first have been the cause of the greatest losses to beekeepers. A great many people when bacteria are talked about think the subject is quite beyond them. It is a pity this is so, as it is not at all difficult to understand the facts about them, which are most important in the treatment of disease.

Bacteria, often called germs, microbes and parasites are very small plants. It takes 12,000 medium sized ones placed end to end to measure one inch. They increase by dividing in two, these two divide into four, four into eight, and so on; this taking place so rapidly that millions are produced in twenty hours. As the food in the medium, on which they are growing, becomes exhausted a good many species form spores, which we may compare to the seeds of higher plants. Spores are much more difficult to kill by heat or disinfectants than the bacteria themselves. It is well to remember that there are countless numbers of bacteria everywhere about and around us, but the majority are harmless, many are beneficial, and only a small number harmful. To study bacteria we require to prepare special media on which to grow them, and as the different species form growths (in most cases) peculiar to themselves we are able to classify them. To tell the genus we use the microscope.

Our second group was the protozoa. Unlike bacteria, these are animals—not plants. They are very small, the majority consisting of one cell only. They grow in the tissues of the living animal and thus produce disease very much in the same way as bacteria. We cannot grow them on artificial media like bacteria, and this renders the study of their life history a matter of very great difficulty. Nosema apis of which we have heard so much in late years, belongs to this class of animals.

We come to our third group of micro-organisms, fungi; and here we have only to speak of those which are very little higher in the scale of being than bacteria. They are made up of branching threads called mycelia, and they have quite a number of ways of producing spores. They cause an immense amount of damage to the different kinds of plants and vegetables (rusts, smuts, etc,). but comparatively little to the animal kingdom.

The known exciting causes of disease are to be found in one or other of these groups, and when the unknown causes are found out, in all probability, we will discover that they also are due to bacteria, protozoa or fungi.

Now, the object in the investigation of diseases is to find out a successful mode of treating them.

Treatment is of two kinds, empirical and rational. The first is that employed by the quack, whether he is a duly qualified doctor or not, and consists of treating the symptoms; for example, a patient complains of headache, and the doctor gives him a medicine which will so act that the pain will cease for a time at least. The man who treats his patients in that way is a quack. The true physician of man or beast is he who finds out the cause of the headache, whether it be the stomach, heart, liver, or other organ, and treats the seat of the malady, when the headache will disappear of itself—that is rational treatment. This shows clearly the object of the investigations We desire to find out the causes of disease, and having found that we are more likely to find a way to prevent the disease. We are too apt to imagine that the treatment of disease consists in the control or eradication of a disease after it is found in the apiary. That is only the minor part of the treatment—the curative—That of the greater importance is the preventative—"prevention is better than cure".To prevent a disease is to keep out its exciting cause, and to do this we must know what it is and where it is found.

In curative treatment we make use of two widely different principals—the removal of disease-producing material, thereby removing the germs and the use of drugs. If we remove the combs from a hive the principal source from which the brood is infected is taken away. While the principal involved in the treatment by drugs is that of an antiseptic, the theory being that a small amount of some drug like beta naphthol, salicylic acid, carbolic acid, formic acid, eucalyptus, etc., is sufficient, when taken with the larval food, to prevent the growth of pathogenic bacteria.

In a paper by Dr. White, of the U.S. Dept. of Agriculture, recently published it is stated that there is but one bee disease the cause of which is absolutely known, i.e., American foul brood. So you see even with foul brood and paralysis off the list of diseases we have, an immense field for research.

During the past year I have examined over 1500 bees from all parts of the Commonwealth, chiefly for the purpose of settling the vexed question—"Does Nosema apis do any harm in the apiary."

I find the number affected with Nosema is a trifle over 17 per cent, quite a respectable percentage, but one which is not sufficient to account for the entire disappearance of a colony. Then again, in certain districts Nosema is present to a very much greater extent than in others, and there the mortality is no larger. So far as our present knowledge of Nosema apis goes it does not appear to be the cause of much, if any, harm, though we will not be able to say definitely till the life history of the parasite is fully known. In my examinations I found that the bacterial fluval in bees from healthy and from dwindling colonies are practically the same, and in the few cultivations I made I detected no special organism that would account for either spring dwindling or paralysis.

I would like to hear from you gentlemen some opinions on the subject of weakened constitution, and whether the continual removal of the golden stores from the hive and the consequent continual working at high pressure on the part of the bees to renew their supplies have any effect on the sonstitution of the bees. You must allow that in your apiaries the bees are living under un-

natural conditions, and I am of opinion that until a race is evolved suitable to those conditions you will have losses. Losses, however which will gradually diminish as the years roll on.

BEE DISEASES OBSERVATION.

By MR. R. BEUHNE.

Since 1901, when I had the misfortune to lose just 200 colonies of bees by what is now generally known as the D.T. or disappearing trick, I have not only had the subject in mind continually and collected all the data available in my own experience, but I have also been in communication with nearly all those beekeepers I heard of who had suffered similar losses.

From the first recorded losses to the present day many different causes have been assigned to this abnormal mortality, such as poison, birds, old bees, old queens, malnutrition of larvae, bee paralysis, and lately, Nosema apis, not to mention such indefinite terms as spring dwindling.

The object of this paper is to endeavour to arrive at some conclusions founded on the present state of knowledge of the dieases of adult bees. Of the alleged causes of D.T. I will at once pass over, poison, old bees and birds as not being worthy of serious notice.

Malnutrition.—Next we have malnutrition of the larvae, a subject on which Dr. Cherry some years ago gave a very interesting address to this Association. The gist of it was that as with insects there is practically no replacement of tissue when once the adult stage has been reached and any deficiency in food during infancy must therefore result in impaired vitality of the adult insect. Now, at whatever figure we assess the average length of life of the bee it follows that, if it is shortened by a few days, by constitutional or inherited weakness, or as Dr. Cherry stated by malnutrition of the larvae, there will be a smaller yield of honey during the working season and a sharp decline during winter when no young bees are hatched. When brood rearing ceases for a considerable time owing to unfavourable climatic conditions, the surviving old bees will rapidly wear out when brood rearing and pollen gathering commences in spring, and thus a point may be reached when nearly all the old bees have succumbed and there are not sufficient young ones yet to maintain the necessary temperature and carry on the work of the hive. Most of you have probably observed what a length of time the bees of a queenless and broodless colony will live; but how very soon they wear when given brood to raise. Thus even bees of low vitality, such as may result from poor or insufficient larval food, may suurvive the period of inactivity of the winter months and then rapidly wear out under the stress of brood rearing and active field work.

This theory seems to fit the D.T. trouble very well, but I thought it would be just as well to apply a practical test. When replacing my losses of bees I purchased swarms from districts where there had been no shortage of pollen in the previous season and no disappearing in the early spring. These swarms as they arrived I put on the extracted combs of the hives from which the bees had disappeared, excepting six swarms which were given the combs just as they came from the defunct hives, containing both sealed and thin watery honey. These six stocks commenced to go down in about a fortnight while all the others that were given empty combs were working normally. On other occasions when I had disappearing at the out-apiary I repeatedly put the remnants of colonies bodily on to good normal hives, and in nearly every instance those colonies dedeclined for a time. If malnutrition of the larvae were the only cause the

swarms which were given combs containing thin honey should not have been affected. Two years ago, when the heavy mortality occurred in the Stawell district, beekeepers extracted thin honey from the combs of surviving colonies and threw it away. I have on several occasions used it later in the season for stimulative feeding with good results. I should mention, however, that immediately after extracting I heated it to 170 degrees to prevent fermentation. (I shall revert to this further on).

2. Bee Paralysis.—According to Dr. Zander, this is a disease of which nothing is known. It is, however, one with the symtoms of which most Australian beekeepers are well acquainted. Bee paralysis seem to be partial to certain strains of bees. Pretty bees are most subject to it. Its first indication in the colony is the presence of a few shiny emaciated looking bees,later on numbers of bees with abnormally inflated abdomens are noticed. They may been seen about the hive entrance, wings and legs extended sideways in a sprawling sort of way and moving in a quivering jerky manner. When paralysis has been present in a hive for a considerable time even bees, but a few days old, become affected. They crawl from the hive, fall over on their side or back and remain in this position, with their feet just moving a little for hours before they die. In the first stages those shiny skinny bees are still capable of flight, and some will go foraging, but they often remain on flowers and other objects and die there.

The beekeeper, when finding these dead bees with the symptoms of paralysis, if he is losing bees at the time, concludes that that is the way they all go. When his colonies have come through in good condition he does not look about for dead bees; if he happens to notice a few he does not trouble himself about it.

My observation on paralysis in relation to D.T. is that colonies affected by the former in autumn are less subject to disappearing in spring than normal colonies. I cannot account for it in any other way than that colonies, suffering from paralysis, being poor gatherers and disorganised, gathered but little of the thin watery honey which is present in hives from which bees disappear in spring.

3. Nosema Apis.—At present the fashionable bee disease, discovered and named by Dr. Zander, of Erlangen, in Germany, two years ago, is said by him to have caused more losses in one district than foul brood in the whole kingdom of Bavaria. The cause of this disease, according to Dr. Zander, is an animal parasite living in the middle intestine of the bee, the inner lining or epithelium of which it consumes, causing the death of the bee. The disease is said to be highly infectious—being communicated from infected to healthy bees by feeding, transmitted through the combs, drinking water, and the contaminated surroundings of the apiary.

Symptoms.—The symptoms are described as sudden mortality of large numbers of bees. The bees separate from the cluster, fall to the floor of the hive, crawl excitedly out at the entrance, and unable to fly, collect on blades of grass and other objects and sooner or later die, the abdomen being more or less inflated. Dr. Zander has studied this disease in Germany, and it would be presumptuous on the part of a layman to dispute his conclusions so far as Germany, the scene of his labours, is concerned. When, however, Dr. Zander, in "The British Bee Journal" of April 14th, takes it for granted that the loss of 996 colonies of bees out of a total of 1,783 at Stawell was caused by Nosema apis, I cannot but differ from him and contend that the statement is not proved.

In the case of the disappearing trouble, there are no large numbers of bees leaving the hives, collecting on objects near it, etc. As a matter of fact there are no more dead bees to be seen in the vicinity of an apiary from which the bees are disappearing than if all the colonies were in normal condition. If the old combs are the chief cause of propagating the disease, how is it that bees put on them after they have been extracted will thrive so well. Most apiarists who suffered disappearing losses, used all the combs that were serviceable for the increase to replace their losses. To quote a typical case, Mr. F. Howard, of Glenorchy, had 94 colonies of bees in the autumn of 1908. In February he shifted 23 of them, which were in a very poor state, to a bee site in the scrub country. In August Mr. Howard noticed that the 71 good colonies left at home dwindling; he shifted 45, leaving 15 at home, 11 having disappeared already. At the end of September there were 5 remnants left out of the 45 moved in August. Of the 23 undersized stocks shifted into the scrub in February one had gone through failing queen, while the 22 were fine strong single-story colonies. The hives from which the bees had disappeared contained both sealed and thin honey. Mr. Howard extracted the unsealed honey and destroyed it, but left the sealed and closed the hives up. Later on, when he had sealed queen-cells from the swarmed stocks, he re-established colonies in these same hives and on the same combs from which the bees had disappeared, by transferring combs of brood with adhering bees and a ripe queen-cell into them, and as Mr. Howard says: "they went ahead and never looked back"—they were fairly booming by the end of December. From the 22 hives and 11 remnants Mr. Howard increased to 117 strong colonies, and took 104 tins of honey as well, and all this without destroying or disinfecting anything.

Accepting as a fact the infectiousness of Nosema apis, Mr. Howard and all the others who suffered losses from disappearing, including myself, could not have re-established their apiaries, using the same combs, hives and fittings, if Nosema is the cause of the disappearing mortality.

The microscopial examinations of bees made by Mr. Laidlow since our last convention, shows that the Nosema apis parasite is present not only in almost every apiary in this State but also in New South Wales, Queensland, South Australia and Tasmania. Specimens from localities which never experienced any losses from disappearing were infected with Nosema apis to a high degree.

Out of 84 lots, 20 bees each, examined by Mr. Laidlow, after deducting as doubtful the cases were nearly hatched bees were submitted or only one lot of bees examined, only two apiaries remain apparently free from Nosema. I say apparently because examinations of larger numbers of bees from these two places or at different periods of the season may yet reveal the presence of Nosema parasite.

Mr. Laidlow has kindly supplied me with the findings of his examinations as soon as made, and I have communicated with the beekeepers and obtained information as to the effect of the presence of Nosema in bees, on the condition of colonies, and the commercial aspect of beekeeping.

Mr. Birmingham, of Spalford, Tas., informed me that he has had no disappearing and that his bees were in good order. Live bees forwarded by him to Mr. Laidlow showed 35 per cent. infected and dead bees 80 per cent.

Mr. Freeman, of Great Western, last spring purchased two different lots of bees. One lot from Echuca, which

worked up well, another lot from Whagunyah, which was declining, at the time; both lots being moved on to the same site. The prosperous Echuca bees showed 35 per cent. of Nosema, and bees from a Whagunyah hive in the last stage of decline, only 20 per cent.

Mr. Cutler, of Balmoral, had a very good yield of honey this season and his bees, with the exception of one colony, were in the best condition. Mr. Laidlow found Mr. Cutler's booming bees infected with Nosema. Live bees 15 per cent., dead bees 40 per cent. Live bees from the only colony which did no good contained only 10 per cent.

Mr. H. Russell, of Wartook, did well with his bees early in the season. His live bees were infected to the extent of 50 per cent., while the dead ones forwarded were free from Nosema.

Mr. G. Smith, of Duart, Casterton, had some black bees doing very well while golden Italians were in a poor way. The black bees had 25 per cent. Nosema, the goldens only 5 per cent.

Two colonies of my own, which, during the time of Mr. Price's investigations, must according to his examinations have had almost every bee infected with Nosema are quite normal colonies now; no combs have been removed, and no treatment of any kind given excepting that they were re-queened. I may add that in this apiary I have had no losses from D.T. for six or seven years, yet of 50 colonies which I sent to Glenorchy in November, 1908, 40 went under at the time of the Stawell losses.

Now, as Nosema apis has been proved all over Victoria, and there are many places in which the D.T. never occurs, we cannot but come to the conclusion if the Nosema parasite is a factor in D.T. at all it is only a secondary one, and the main cause will perhaps eventually be found in a combination of adverse conditions such as a dry summer with a dearth of pollen in the previous season followed by a late flow of honey from certain eucalyptus.

Thin Honey.—This honey, instead of ripening, absorbs still more moisture from the atmosphere, and that it is, or contains, the main cause of the loss of bees seems evident from the fact that upon removing it from the reach of bees, declining colonies, if not already too weak, will recover.

How this thin honey reacts upon the bees we do not know yet. It may be that in the quantity a bee can consume in a given time there is not sufficient carbo-hydrate to produce the animal heat and energy required for active work, or being, as it is, a saccharine solution containing also nitrogen, it may be a suitable medium for fungi and bacteria which bees in an infeebled condition cannot resist.

Even if we assume that there is connection between Nosema apis and D.T., which, however, is not proved, the fact remains that our bees do very well, notwithstanding this parasite which is present wherever there are bees in large numbers, and which we cannot deal with.

It is only when other factors that are more or less under our control are present that losses occur. Taking thin honey as the main cause we can reduce the risk by preventing its storing by the bees by the contraction of the hive or the removal of it from the combs if it is stored.

It has perhaps occurred to some of you that the symptoms of Nosema apis as quoted from Dr. Zander's book, namely sudden mortality, leaving the hive, bodies inflated, are a very fair description of bee paralysis. It appears so to me, and soon after the publication of Dr. Zander's researches I endeavoured to discover whether bee paralysis and Nosema apis were identical, but the examination of bees in various stages of bee paralysis made first by Mr. Price and since by

Mr. Laidlow and Dr. Brown, proved that there is no connection between these two diseases. Some of the specimens affected with paralysis certainly contained Nosema spores the same as bees not affected, but many specimens of paralysis of the most pronounced type were entirely free from Nosema apis.

In attempting to bring into focus the present state of knowledge, or I should rather say want of knowledge, I have had to omit much information bearing the subject or make this paper of inordinate length. I have I think chosen the medium, and as there are, no doubt, apiarists present here who can support, amplify or contradict them, there are also those who perhaps see things in the same way, and I trust that the discussion following will materially add to the knowledge of those engaged in the beekeeping industry.

A long discussion took place on bee diseases. Varying conditions were suggested by many beekeepers as being the cause, but from the distribution of trees it could not be agreed that any one tree was in bloom at the time to cause the disease. But there seemed to be a suspicion among many of those present that white ironbark was the cause. Watery honey under certain conditions and from certain trees was thought by most beekeepers to be the cause.

Important Points to be Considered in Producing Comb Honey on a Large Scale.

By Adrian Getaz.

It cannot be denied that it is far easier to produce extracted honey on a large scale than it is to raise comb honey. On the other hand, in many localities, mine for one, the difference in price and the larger demand make it almost a necessity to produce comb honey rather than extracted.

The next question, when operating on a large scale, is, unquestionably, how to minimize the work without lessening the returns; or, at least, not enough so that one would lose more than he could gain. This may depend a good deal on the locality. In a good locality a few pounds more per colony might be gained by using a more elaborate management, but the larger number of colonies that the apiarist could work with simpler system would more than make up for the difference. In a poor locality, where the few pounds gained might constitute the biggest part, or, perhaps, the whole of the surplus obtained, the question is altogether different.

But any one who contemplates beekeeping on a large scale should select a good locality, and this contribution will be written from that standpoint.

Shaking for Requeening.

I am emphatically in favour of requeening instead of shaking or dividing to prevent swarming. Dividing requires an extra set of hives which is quite an expense when working on a large scale. Then extra combs have to be taken care of. But that is not the most important point. In the process as used nowadays all the combs are carried to a new stand and the colony has to rebuild a new brood nest. That means a certain quantity of honey to be consumed to produce the necessary wax, and, what is worse, quite a number of bees are engaged to do the work instead of going to the field and working in the sections. In my locality that means about thirty pounds of honey on an average. As these thirty pounds very often constitute my sole surplus, or nearly so, there is no wonder that I should object to a system of management involving that loss.

(To be continued.)