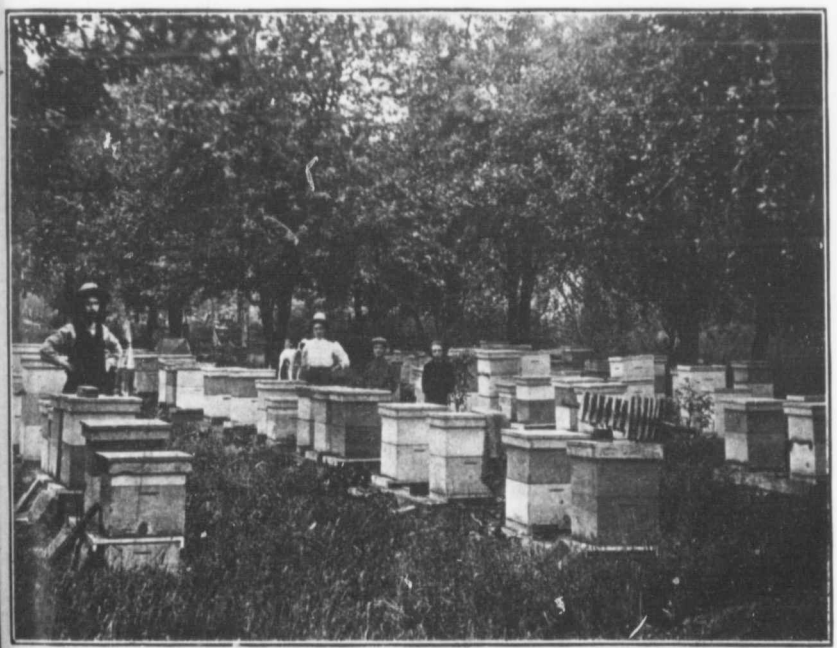
The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

Vol. 17, No. 8. August 1909 $1.00 Per Annum



Partial View of 130 Colonies Owned by Grimoldby Brothers, Owen Sound.

PUBLISHED BY
The HURLEY PRINTING CO.
BRANTFORD, CANADA

The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

JAS. J. HURLEY, Editor

Published monthly by

The HURLEY PRINTING CO.,
Brantford, Ont.

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The Canadian Bee Journal

PUBLISHED MONTHLY

JAS. J. HURLEY, EDITOR, BRANTFORD, ONTARIO, CANADA

Vol. 17, No. 8. AUGUST, 1909 Whole No. 534

We have great pleasure in presenting on our cover this month a handsome cut showing part of an apiary of 130 colonies owned by Grimoldby Bros., Owen Sound. They run their yard for both comb and extracted honey. They find it pays better to produce both rather than run entirely for one kind. They claim that it also divides the work and makes it more of a pleasure. Their chief flow is from clover and a little from basswood. They get no buckwheat. From the appearance of their yard, we have no hesitation in saying that they are up-to-date bee-keepers.

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An interesting article on cellar wintering appears elsewhere from Mr. David Running, of Grindstone City, Mich. The low and even temperature at which the cellar is kept all winter and during the early spring, is of special interest. Also his scheme of packing after carrying the bees from the cellar. This gives him practically all the advantage obtained from out-door wintering. A warm hive and a dry hive in early spring are most desirable features.

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In reference to what appeared some time age about the bees working on the refuse, or "pomace" of cider mills, Mr. Chalmers writes us that he has had experience in this matter from a nearby mill in the past. The sour cider is very bad for winter stores. He suggests that where bees are in the neighborhood of a mill the owners should be obliged to dispose of the pomace in a proper manner daily, so that the bees may not have access to it.

In the August American Bee Journal Editor York gives considerable attention to what we wrote in reference to the inspection of hives, in reply to M. M. D., in British Bee Journal. He seems to think we have wounded Editor Root in a tender spot by insinuating that his desire for hive disinfection is brought about because of his connection with the bee supply business, as the burning, scorching or boiling of hives may mean greater sales. He attempts to defend Mr. Root in what appears to be a labored effort, and with considerable method in his madness, applies the scalpel to the alleged wound, and cuts it deeply, slits it up and down, turns it inside out, and when he has his victim bleeding profusely, he turns to his nine thousand audience, and with considerable dramatic force, in effect says: "Now, Mr. Hurley, will you please tell us in plain English why you made THIS wound?" Really, now, Brother York, if we have wounded our contemporary so badly, would it not have been better to have left the healing thereof to ourselves and Brother Root. His reply in Gleanings, August 1st, does not give evidence that he is very badly wounded. What we, and doubtless many of your readers, would have appreciated, however, is your opinion upon the matter under discussion — IS IT NECESSARY TO DISINFECT HIVES?

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Doubt is expressed by two of our correspondents that the dead brood reported by Mr. Schrank is black brood. From the description given they think it is the common dead brood commonly called starved.

Mr. Clark, of Cainsville, reports what we consider a very unique experience. Up to Aug 20th, with abundance of buckwheat all around, his bees were working on alfalfa clover and ignored the buckwheat entirely. Everything that was coming in was light honey, unmixed with anything dark. We were very much surprised at this. Has anyone else had a like experience?

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First correspondent: Dear Sir—Will you kindly let me know by return mail the amount of your crop and average per colony? Also, what was the nature of the crop in your district? Mine is the same as last year. Yours, etc.

Second Correspondent: Dear Sir—Replying to yours of recent date, would say that my crop is the same as yours—same as last year. Yours, etc.

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We believe Mr. Chalmers has worked up a good wintering case. We will be pleased to give space to a description of it, and any illustrations that will make it clear. The individual case setting around the hive during the summer is a great protection from both sun and windstorm. At first thought one would suppose that they would be in the way, but a visit to Mr. McEvoy's yard would soon dispel the illusion.

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Now is the time to plan for feeding up for winter. Do not leave it till too late. Many a hive will be lost next spring that may be saved if properly fed in August or the fore part of September. Remember that sugar feed is cheaper than honey and oftentimes better.

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After a season of hard work, divided between his own apiaries and that of inspection work, Mr. J. L. Byer, and family, is taking a holiday in New Ontario. He reports a good crop. We regret that his usual budget of notes do not appear this month.

Great quantities of honey have been placed upon the market during August. In fact, we are well within the mark when we say that four-fifths of the light honey crop has been sold. Prices have ranged from 9c to 12 1-2c—10 cents being the popular price. If some producers could have held for a time, we think they could have got higher prices in some cases. It is not a difficult matter now to get 10c per pound for honey wholesale.

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The July issue of the Australasian Bee-Keeper is to hand, and contains a very lengthy report of the Victorian Apiarists' Association, which took place in Melbourne on Tuesday, June 22. Mr. F. R. Beuhne, president, occupied the chair, with forty delegates present. The addresses were very practical and interesting. Some of the problems of Australasian bee-keeping are unknown to us in Canada. They are putting up a strong agitation for government assistance and we trust they may be successful. From a close reading of the report it is easily discerned that Mr. Beuhne is a tower of strength to his fellow bee-keepers. He seems to be a perfect repository of bee lore.

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Strengthen weak colonies now with frames of brood from strong ones, if you desire to take them through the winter and avoid doubling up.

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Mr. J. H. Stoneman, of Kelwood, Man., writes us asking if we can let him have a barrell of honey. Sorry, but we are all sold out. We really do not know where he could get it, either. But we herewith give all our Ontario friends an equal chance to get after this business. If five hundred or more should write, we trust he will let us know his opinion on the advantages of advertising. Those writing him will please quote price.

BLACK OR EUROPEAN FOUL BROOD

In a private letter, Mr. Byer says: "You say that it would appear that European foul-brood is getting a start in Ontario—page 246. I fear that a lot of the bee-keepers around Trenton, Brighton and Arnprior will think you are indulging in a little sarcasm." We regret to learn from so good an authority that this disease has become so bad in the district named. Our brother bee-keepers so afflicted have our deepest sympathy. We certainly had no idea that it was really so bad. We regret also that there is nothing that we can advise, because we have as yet had no experience with it. We have, therefore, in this article, endeavored to give all the information available on the subject. The public interest might have been better served had our readers in the afflicted district, who have suffered from the disease, acquainted us with the condition of affairs sooner.

Our thanks are, therefore, specially due to Mr. Byer for giving us such information as we have in a private letter written just previous to his taking a holiday. It appears that the idea has been generally entertained that this dead brood was starved brood. In fact, we have held this opinion ourselves. On this point Mr. Byer says:

"As to whether this dead brood is always "starved brood," is a question. Personally, I do not believe that nearly all this dead brood is starved. A simple experiment: Remove the queen from a colony that is affected badly with this dead (starved?) brood and introduce another one. In many cases (not all) just as soon as the larvæ are developing from the eggs laid by the new queen, this dead brood will disappear. As the same strain of bees are feeding this larvæ as was the case before the old queen was taken away, certainly poor feeding of the larvæ was not responsible for the trouble. The trouble in cases like this would appear to be that the eggs of the old queen were lacking in vitality, just the same as eggs of hens; while they may be fertile enough to develop the chicks to the hatching period, yet from lack of vitality, they soon die after that time. Mr. John Timbers first called my attention to this matter, and from what I have since noticed I am convinced of the truth of his contention. Try this experiment in a colony that is affected with a lot of this dead brood, and see of it does not work out as I have described."

This idea of Mr. Timber's, and endorsed by Mr. Byer, is directly in line with what is said and written by others, viz.: that the removal of the queen will as a rule remedy the trouble. If we remember rightly this idea was expressed by Mr. S. D. House at our convention in Toronto two years ago. The same idea is stated by Mr. E. W. Alexander in one of his articles on bee diseases, which we subjoin to this article. Note particularly what he says, and see how closely it accords with what Mr. Byer reports:

"These (the queens) are to be introduced to your diseased colonies on the twentieth day after you have removed their old queen, AND NOT ONE HOUR SOONER, for upon this very point your whole success depends; for your young queen must not commence to lay until three or four days after the last of the old brood is hatched, or 27 days from the time you remove the old queen. If you are very careful about this matter of time between the last of the old brood hatching and the young queen commencing to lay, you will find the bees will clean out their breeding-combs for this young queen, so that she will fill them with as fine, healthy brood as a hive ever contained."

Now, with the weight of Mr. E. W. Alexander's evidence, together with that of Mr. House, (if we remember rightly), it would appear that this idea is pretty conclusive. If it is conclusive, it appears to us that it proves more than it is in-

tended to prove. It proves that there can be no contagion, no germs, no infection, in this disease. If it is a germ it could not be cured in this manner. What, therefore, is it? From the evidence, it would appear to be some impotence in the queen; some pathological trouble. Or, if not this, it is caused by some external trouble with the food. Mr. Alexander held to the view that the queen was not responsible for the trouble! This is a problem for our bacteriologists to determine.

What troubles us most is the so-called rapid spread of the disease. If it is not a contageous germ disease, how does it spread? Until this problem is solved many of those who hold that it is simply starved brood will feel justified in still holding to their opinion. It is quite evident, therefore, that, as yet, we know very little about the trouble.

After expressing our opinion thus freely we must present what Dr. White, of the Apiculture Bureau, Washington, D. C., says on the subject:

European foul brood is another infectious bee disease. It attacks the brood at an earlier period in the growth of the larvæ, as a rule, than American foul brood. The cause of this disease is not definitely known. From brood dead of this disease, Cheshire and Cheyne isolated Bacillus alvei. From their work it was long supposed that Bacillus alvei was the cause of the disease, but later investigations make the value of their work doubtful.

A number of organisms have been found in the larvæ dead of this disease and some of them have been discribed. One species has been encountered in our investigations of the disease which is of special interest. The individuals of this species are quite small, apparently non-spore-producing media. Until we know more about this species it will be referred to as Bacillus "Y." Since the cause is not positively known, the amount of heat and chemical disinfectants to destroy the virus has not been demonstrated. If, later, Bacillus "Y" is demonstrated to be the cause, we shall expect that very much less heat will be sufficient to kill it than is necessary to kill Bacillus larvæ, the cause of American foul brood. Likewise we shall expect that disinfectants will be much more readily effective. As the exciting cause has not been demonstrated, the determination of these facts has not yet been made. Until we know more about the etiology of European foul brood, we can do no better than to suggest the application of the same principles which are found advisable in American foul brood.

So-Called Pickled Brood.

We refer to this disorder of the brood as the "So-called Pickled Brood" and not Pickle Brood, because the condition which William R. Howard of Fort Worth Texas, described is not what the bee-keepers know as Pickled brood. The exciting cause of this disease is not known. The larvæ die at that age just preceding or just after capping. Some bee-keepers have a theory that heredity plays an important part as a predisposing cause. As far as is known, it does not seem to be infectious.

Treatment.—This disease is treated by some bee-keepers by requeening, on the assumption that heredity is the important factor in the production of the disease. If more were known concerning the etiology, the treatment might be materially changed.

The following is E. W. Alexander's article on black or European foul brood, taken from Root's compilation of Alexander's writings, and will doubtless be read with great interest:

This has been one of the hardest problems for me to solve that I have ever met in bee-keeping. For three years we tried everything in the line of disinfectants that we could hear of, also putting our bees on foundation, which did but little good. Some of the things we tried seemed to help at first to check its deadly work; but in a short time it would show itself again as bad as before; and so the years went by while we lost nearly our entire honey crop and over a thousand colonies before we got the first sign of a cure, and even then it was so simple it seemed like a drowning man catching at straws. But I kept at the little proof I had until I developed it into a perfect cure. Then for three years we tested it thoroughly on hundreds of colonies, so that we could be sure it was a cure which could be depended on.

This cure is on the line of introducing new blood into the apiary, which will necessitate getting a choice Italian

breeding-queen, one of the best honey-gathering strains that can be procured. For this special purpose I prefer quiet yellow Italians. Now for the cure:

Go to every diseased colony you have and build it up either by giving frames of maturing brood or uniting two or more until you have them fairly strong. After this, go over every one and remove the queen; then in nine days go over them again, and be sure to destroy every maturing queen cell, or virgin, if any have hatched. Then go to your breeding-queen and take enough of her newly hatched larvæ to rear enough queen-cells from to supply each one of your diseased queenless colonies with a ripe queen-cell or virgin just hatched. These are to be introduced to your diseased colonies on the twentieth day after you have removed their old queen, AND NOT ONE HOUR SOONER, for upon this very point your whole success depends; for your young queen must not commence to lay until three or four days after the last of the old brood is hatched, or 27 days from the time you remove the old queen. If you are very careful about this matter of time between the last of the old brood hatching and the young queen commencing to lay, you will find the bees will clean out their breeding combs for this young queen, so that she will fill them with as fine healthy brood as a hive ever contained. This I have seen in several hundred hives, and have never seen a cell of the disease in a hive after being treated as above described.

It is not necessary to remove any of the combs or honey from the diseased colony; neither is it necessary to disinfect anything about the hive. Simply remove the old queen, and be sure the young queen does not commence to lay until three or four days after the old brood is all hatched. This treatment with young Italian queens is a perfect cure for black or European foul brood.

In regard to those old queens that were formerly in your hives, I think it best to kill them when you first take them from their colonies—not that the queen is responsible for the disease, for I am sure she is not; but a young Italian queen that has been reared from a choice honey-gathering strain is worth so much more to you that I can not advise saving these old quens.

I have experimented along this line considerably, and found, after the colony has been without a queen 27 days, as above directed, it will usually be safe to give them one of these old queens, and the cure will be the same. Still, there have been exceptions, so I advise killing them at once.

Now, my friends, don't let another season pass without cleansing your apiary of this disease, and also at the same time requeen it with young Italian queens so you will not only harvest a fair crop of honey next summer, but will have an apiary that you will be proud of and take pleasure in showing to your friends. I knew many of you have become discouraged in trying to rid your apiaries of this fatal disease; but that does not help matters any. The only proper thing to do when these troubles do come is to face them with a determination to overcome any and every obstacle that comes in your way; then when success rewards you for your perseverance, how pleasant it is to look back over the past and realize that you have accomplished all you labored for! I hope that you who have this disease in your apiaries will give this treatment a thorough trial next season.

I do wish I could impress on the minds of all bee-keepers that I have never recommended any cure for American foul brood, and I wish to have it understood that I don't think that, up to the present time, there has ever been a comb that was affected by American foul brood cured of that disease. You might as soon expect a colony of bees to clean out their combs if filled with paint as to expect them to be able to remove the rotten larvæ from American foul brood combs. I will admit that there are some things seemingly about the same in European foul brood and American foul brood, but in other respects they are no more alike than the mildest case of bowel trouble and the Asiatic cholera.

Many bee-keepers are continually speaking and writing of these two diseases as one and the same. Now, if it were not for the young and inexperienced bee-keeper, I would not notice this mixing up of a very important matter. Then when my critics go still further and speak of the cure I recommended for European foul brood as failing to cure American foul brood, and in that way belittle that cure when I from the first wrote that I did not think it of any use for American foul brood, they do me an injustice. You might as well expect

to cure American foul brood by throwing a cup of cold water in the grass in front of your hives as to expect to cure it be requeening as I recommended for European foul brood.

The reason why American foul brood has never been cleaned out of a comb is because a larvæ that dies from that disease is so much like glue that the bees can not remove it in its soft state; and before it dries down it penetrates with its spores into the cocoons of the cell until it becomes a part of the comb itself, where it can not be reached by any disinfectants, nor removed by the bees. Such infected cell becomes ever afterward worthless to rear brood in. But not so with European foul brood. Even in its very worst stages, after the larvæ dies with this disease it soon dries up and cleaves from the cell, and is easily removed by the bees; consequently the cell is soon ready for another egg which often matures into a healthy bee.

Another point of difference is, a larvæ affected with American foul brood seldom dies until about old enough to be capped over, or after it is capped by the bees, while a larvæ dying from the effect of European foul brood seldom lives to be capped over, as it usually dies when from two to four days old. There is only one course of treatment for American foul brood that is of any use. This is now known as the McEvoy treatment. That is, to remove the bees from their combs and put them on comb-foundation starters, and in two or three days remove them again to full frames of foundation. This treatment will save the bees, but is no cure for the combs, which are worthless except for wax. Fifteen years fighting this disease forty years ago, when this part of New York State was badly affected by it, gave me lots of experience. At that time I lost several hundred colonies with American foul brood, as we had no foundation then to use, and our only way was to cut out the combs as fast as it appeared and melt them up, and let the bees build new combs again. We cut the combs across just above the brood, leaving the honey in the hive with a strip of comb as a starter to build on. We did not than think the honey diseased, but I now know it was with American foul brood; but with European foul brood I have my doubts as to the honey being affected.

I have given many combs of honey from colonies badly diseased with European foul brood to healthy colonies, and have never seen a case where it had a bad effect. This fact, and that of the honey, combs, and pollen of a colony badly effected with European foul brood becoming perfectly healthy when requeened with a young virgin, as I recommended in my cure for European foul brood, is strong evidence that the honey is not the means of spreading this disease. It is very easy to cure an apiary of European foul brood; but the old American foul brood is incurable. As I said before, you can save the bees by the McEvoy treatment, but you can not save the combs.

I am well aware that on some points in the above I am crossing swords with those who are considered good authority; but on this subject in question I write the same as on other subjects, simply from long and extensive experience. I don't take anything as fact until I have thoroughly tested it on at least 50 or 100 colonies for two or more years. This jumping at conclusions because some one says so and so, I think but very little of.

European foul brood will spread much faster through an apiary than American foul brood, and kill the brood quicker than any other disease that I ever dealt with. Coming as it does before the colonies become very strong in the spring, it soon reduces them to a mere handful of discouraged bees unable to accomplish anything, and it is hard for their owner to realize that he will ever again have strong healthy colonies in those hives.

But don't be discouraged. I have been through it all, and what we have done you can do. All that is necessary is to follow the plan I recommended, and you will in a short time have as strong, healthy colonies as you ever saw.

When we had this disease, black and hybrid bees were about the only ones affected. I sometimes think that, if the apiaries of some bee-keepers were attacked with this disease it would be a blessing in disguise, for it would necessitate requeening their colonies at once with some good honey-gathering strain of Italian bees; and if this were done about the first of June these requeened colonies would be in a fine healthy condition for an August harvest; and then with a good working force of Italian bees their owner would secure a larger surplus than he could possibly have had if it were not for requeening to cure the disease.

I think these black and hybrid bees cost us nearly all we can get from them, and what they lack in squaring accounts with honey they make up in stinging and boiling over and under their hives when one attempts to handle them.

In dealing with this matter now, our thought is that we may as well deal with it fully and thoroughly as far as present information will permit, in the hope that it may be helpful to our Canadian bee-keepers, and give all the information in one article in one issue that is available at the present time. To this end, we subjoin a very able paper from the pen of Mr. R. A. Holekamp, read by him at the Missouri State Bee-Keepers' Association meeting at Columbia, Mo., January 6 and 7, 1909.

The subject on which I have prepared a paper is of the greatest importance to the bee industry, since the profit in bee-keeping depends largely on the healthy condition of the colonies.

Our Department of Argiculture in Washington employs quite a corps of workers in charge of apiculture and we have depended to a great extent on the investigations of the department to enlighten us on the causes which bring about the diseased conditions of the apiaries.

It seems, however, as if the experts at Washington are not making much progress in the work of discovering the causes of disease and in finding remedies for successful treatment, therefore the practical bee-keepers must not relax in experimenting on this line and comparing notes on what they have observed.

The most common disease in the middle and western part of the United States is foul brood, or as it is now named by the Department of Agriculture, "American foul brood." This is the disease which mostly threatens the apiaries of our state, which spreads from colony to colony, from apiary to apiary, and which, if not checked would finally destroy the bee industry of our state. A colony attacked by this disease never survives, unless treated by the bee-keeper, and if the colony is left to dwindle away the remnants will bring destruction to the colonies whose bees rob them out.

The symptoms of this disease are well known, and, thanks to the discoveries of that veteran foul brood inspector from Ontario, Canada, Mr. Wm. McEvoy, is easily cured by the careful bee-keeper, and in states where proper laws have been enacted to prevent the sale and importation of diseased colonies and where inspectors see that all apiaries found affected are properly treated, we may entertain the hope that this disease may be brought under control.

As to the disease of black brood, or as it is now called by the U. S. Department of Argiculture, "European foul brood," a disease which has been prevalent in the eastern states and which seems to be spreading rapidly over other parts of the country, different treatments have been advised. At our San Antonio convention Dr. White of Washington informed us that American foul brood was caused by a bacillus which he named "Bacillus larvæ," while European foul brood, commonly called "Black brood," was caused by Bacillus advae.

At our national convention last October at Detroit, Mich., Dr. White was not so certain about these two bacilli any more, and he stated that no new remedies had been discovered for any disease amongst honey bees, and that all diseases ought to be treated same as American foul brood.

This would leave us the only remedy we have, the McEvoy treatment, or the modification therefrom, the Baldridge treatment. These treaments are based on the theory that the bees must either be compelled to empty their honey sacks before feeding any larvæ or storing any honey in the hive in which they have been transferred, or to be caused to leave the diseased hive with an empty honey sack and to enter the hive to which they are being transferred either empty or the honey sack containing only nectar, gathered after they left the diseased hive.

The first condition is brought about in the McEvoy treatment, while the second condition exists in the Baldridge treatment.

There has appeared in some localities in the western part of Missouri a diseased condition in the apiaries which our inspector describes as follows:

The disease found suits the description of European foul brood almost perfectly and if it is not black brood it is a very close relative. The combs in this disease have very much the general appearance of the American type, but there is gen-

erally a much smaller per cent of the dead larvæ sealed over and it lacks the ropy consistency of the other. Sometimes there will be a very slight tendency to ropiness, but not very pronounced. The odor is very different from American foul brood, being that of a soured dead brood. It seems to be more contagious and sometimes does its work very quickly. In some cases the bees seem to succeed in cleaning it out and all that will be left in a few cases to show its trail will be a few sealed queen cells with dead larvæ in them. It seems to affect the queen and drone larvæ much more than any other disease; the dried down scales do not adhere so tightly as in American foul brood.

On samples sent to Dr. Phillips, in charge of Apiculture of the U. S. Department of Agriculture, came the following answer:

"It is certain the samples sent are not American foul brood. There is a possibility that the trouble is European foul brood. That disease is extremely difficult to diagnose at times, but certain things about your sample suggests it. The matter will be investigated next spring."

Investigation must show whether European foul brood has taken a jump to this western country, or whether the disease will disappear as suddenly and unexpectedly as it appeared.

I will now give my personal experience with a diseased condition found in my own apiary, and in the vicinity of St. Louis and which our inspector has also found in other localities.

Last spring and early part of summer, I discovered in a number of hives dead larvæ, in some hives more and in others less. These dead larvæ were entirely different from the way they appear in foul brood. They were generally white or grayish and watery, not ropy, and had no odor; neither were there any dry scales.

I showed an affected colony to our apiary inspector and we went together through my home apiary of about seventy-five colonies. We examined them closely and I marked the condition on each hive as we went along. Later I accompanied our inspector on his visits at the apiaries in the surrounding country and the same conditions were found, here and there a hive with dead larvæ as described before in otherwise healthy apiaries.

I concluded to make some experiments: One colony which I had noticed the year before as not making any headway and had marked "suspicious" but which last year showed only a few dead larvæ but no symptoms of foul brood I treated on the Baldridge plan. When after three weeks I opened the old hive I found every broodcell empty. There was nothing but capped honey and pollen left in the hive, and I will mention here that I intend to put a swarm of bees on these combs next spring to verify the conclusion that there was no contagious disease in this hive.

When I looked at the combs in the new hive I found most of the foundation built out and all brood healthy. A few weeks later when I had a lot of young laying queens ready I went to this hive to remove the old queen, I found in the hive the old clipped queen and also a young queen, showing that the bees were superceeding.

Another colony which was about the worst affected in the yard, I made queenless and gave it a queencell. This hatched and gave a young queen to this colony. I sent a sample of comb from this hive to Washington for examination, but Dr. Phillips, in charge of apiculture, spent the summer at Hawaii and California, and when the sample reached him from Washington at California, it was reported "mouldy."

Now, I will describe the condition of all these afflicted colonies a month or six weeks later when a big flow of honey was on: Not a dead larvæ to be found, all colonies working nicely. From several colonies which had shown considerable dead brood in early summer I extracted last fall two hundred pounds of honey each.

At the end of the season I had extracted from this apiary ten thousand pounds of fine honey and made artificially a large increase.

Two years ago, a bee-keeper on the Mississippi River about 30 miles from me, who had about one hundred colonies of bees, requested me to come and look at his bees, that they were badly diseased. This bee-keeper being located off the railroad was not easy to reach and probably a month or six weeks elapsed before I was able to go to his place. When I arrived, he told me that he had treated his bees to a drenching with a disinfectant which he was using on his poultry houses and that his bees seemed

to be better now, but that there were two hives which had not been treated, but which were the worst in the yard, and he hardly considered it was worth while to bother with them, as they were so far gone, especially as those bees were awfully cross.

When I opened these two hives there was not a trace of disease to be found and all other hives which I opened contained perfectly healthy colonies. I will mention here that at the time I made this visit there was an immense flow of honey from Spanish needle, there being a slough several miles long in full bloom close to this apiary. Our inspector has been at this apiary last summer and had found it in a healthy condition.

When I went last October to the National Bee-Keepers' Convention at Detroit, Mich., I went there with the hope of obtaining some information on this condition.

The first man I met when arriving at the hotel in Detroit was Mr. Wm. McEvoy, the discoverer of our foul brood treatment, and just the man I wished to see.

I described to him the diseased condition I had found, and he exclaimed: "Starved brood; nothing but starved brood." I mentioned that there had been plenty of honey in the hives where the dead brood was found, and Mr. McEvoy's explanation was that often bees will not uncap honey fast enough to feed the larvæ sufficiently and consequently the dead brood. He described just what I had often noticed; very small young bees hatching from the cells and crawling slowly over the combs seemingly too weak to move.

Mr. McEvoy suggests as the remedy to uncap the honey in the combs. To this I would add, that feeding of syrup might be resorted to, but that probably the requeening from stock which feeds their larvæ abundantly is the proper way of remedying this condition.

If next year the trouble as described would recur—which, however, I do not expect, because I requeened this year most of this apiary—I will be particular to raise queens from a colony which feeds its larvæ plentifully. I expect to overcome the difficulty in this way, and I would suggest that bee-keepers who have noticed the same condition in their apiaries would experiment on the same thing.

I hope that the disease found by our inspector and suspected to be European foul brood or black brood may turn out to be what my bee-keeper friend on the Mississippi found in his apiary two years ago, but as the disease described by our inspector was prevalent during the latter part of the season careful investigation will be necessary .

The dry season may have stopped in those localities the flow of nectar and caused the bees to feed their larvæ scantily and this may have caused the brood to die in the combs.

There is another disease amongst honey bees of which there seems to be very little known and for which different remedies have been suggested, this is bee paralysis. I have had off and on a few cases of paralysis in my yards, but never tried any cure till the season of 1907, when I had about six cases in my home yard, which seemed to be rather bad.

I looked over all literature at hand and wrote to our United States bee experts at Washington, but could not get any information; the only suggestion made from some source was to requeen.

I went to a hive with Italian bees which seemed to be the most afflicted, and removed the queen, intending to kill her, but she being such a large, fine looking queen, I hesitated and then it just occurred to me that there was a good chance to experiment. I therefore took from this hive a comb with a little brood and honey and a handful of bees and put it in a hive with the queen and carried this hive in the lower part of the yard, about two hundred feet away from my other bees. The colony of bees from which I had taken the queen was supplied with a young laying quen.

During the honey flow paralysis disappeared and the afflicted colonies gradually recuperated.

Now, in regard to the queen which I removed from the most affected colony: The little nucleus built up during the summer strong enough, that I could winter it on its stand on three combs, which were well packed all around with carpet and leaves.

Last spring I assisted it with a frame filled with capped brood and honey, and it built up very fast during the summer to a full colony. I extracted from this hive one hundred and fifty pounds of honey, and it is now wintering in a ten-frame hive extremely heavy with honey.

What does this experiment teach? That the queen is not the cause of paralysis and therefore requeening, if the queen is otherwise perfect, is not necessary.

It seems that the cause of paralysis is to be found in the food contained in the hive, which is injurious to the adult bees, as the disease disappears when a good flow comes on.

The remedy might be to remove the honey contained in the hive if practical and to feed syrup in its place. Experiments will be made by me should the disease appear again, but it seems not to come every year; this last season, 1908, I had not a case of it. I would advise bee-keepers who notice the disease next spring to experiment and I would be pleased to be informed of the results.

DEAD BROOD FOUND

In Many Places in Canada and the United States.

Very many samples of dead brood have come through the mail to me since April. A few of the combs contained disease. All the dead brood in the others was the result of uncared for brood, which the bees nearly always clean out before the season ends.

The spring of 1889 was one of the most favorable ones for brood rearing that we ever had in the Province of Ontario, right up to the night of the 28th of May, when a killing frost came, which was followed by a spell of very wet weather. This put a stop to all honey gathering for many days, and at that time every colony had a large quantity of brood to feed. The bees soon fed the unsealed honey, and after that was done they did not uncap the sealed stores fast enough to keep pace with the large quantity of brood that required feeding, and after that more or less dead brood (starved brood) was found in many apiaries throughout the province. Samples of that starved brood were mailed to experts but none could tell what it was.

If the beekeepers had rushed the feeding the next evening after the awful sudden check took place, and continued the feeding until the bees began gathering honey they would have saved all the brood and brought every colony into the honey harvest booming in bees and by so doing secured large crops of honey. During the last two weeks in May, and first week in June, 1895, when queens were doing their best, wet weather set in, and the rains checked the honey flow so often that the bees could not gather enough honey to keep the brood nest supplied with unsealed stores, and when the shortage of unsealed honey took place part of the brood was not fed enough, and it starved and after that dead brood (starved brood) was again found in many apiaries. Starved brood is nearly always the result of a shortage of unsealed stores in the brood nest. One district in Ontario has European foul brood. My method of treatment is a thorough cleansing process and where it is fully carried out will cure any apiary of any kind of disease.

WM. M'EVOY.

CONVENTION PROGRAMME OF THE PENNSYLVANIA STATE BEE-KEEPERS' ASSOCIATION, AT LEBANON.

The Pennsylvania State Bee-Keepers' Association will hold its sixth annual convention, September 8th and 9th, in the P. O. S. of A. Hall, near the Court House, Lebanon, Pa. Headquarters will be at the Eagle Hotel, where the rates to bee-keepers will be $1.50 per day, when two persons occupy the same room.

Wednesday, September 8th, First Session, 1.00 p.m.—Business.

President's address.

"Alfalfa as a Honey Producer," by Chas. N. Creene, of Troy, Pa.

"Bee-Keeping in New Mexico," by Geo. H. Rea, of Reynoldsville, Pa., who spent the summer at Mosilla Park.

Second Session, 7.30 p.m.—

"Address of Welcome," by Dr. Henry Houck, Secretary of Internal Affairs, of Lebanon, Pa.

"Response," by the President.

"Origin and Progress of the Lebanon Bee-Keepers' Association," by E. L. Brown, Secretary of the Association, of Lebanon, Pa.

"Fruits and Honey," by Mrs. H. K. Beard, of Manheim.

"Apiculture in Juanita County and Vicinity," by Prof. H. C. Klinger, Superintendent of the Public Schools of Juanita County, of Liverpool, Pa.

"The Distribution of Brood Diseases in Pennsylvania," by Dr. E. F. Phillips, of the Apiculture Bureau, Washington, D. C.

Thursday, September 9th, Third Session, 9.00 a.m.—

"Accomplishments and Aims of the Philadelphia Bee-Keepers' Association," by F. Hahman, of Philadelphia, Pa.

"Qualities to be Secured in Queen-Breeding," by Penn G. Snyder, of Secane, Pa.

"Extracted Honey," by Harold Horner, of Jenkintown, Pa.

"Honey Dew and the Pure Food Law," by Wm. A. Selser, of Philadelphia, Pa.

"Conditions of Honey Production in Lebanon and Lancaster Counties," by H. K. Beard, of Manheim, Pa.

Fourth Session. At Apiary of Wayne Shilling, Lebanon, Pa. Leave the Court House at 1.00 p.m., taking West Lehman Street Car.

Demonstrations will be given in the Shook Method, by Prof. H. A. Surface and Wayne Shilling.

Circumstances favoring, a "Queen Hunting Contest" will be held.

Exhibits of Bees, Apicultural Products and Supplies are invited.

Come to each session and bring your friends. **All are welcome.**

DISINFECTING HIVES.

Blow-Lamp Disinfecton of Hives.

(British Bee Journal.)

This is an operation which can only be properly performed when done systematically and thoroughly. It is somewhat strange that the terms universally used—both by American and British writers—to describe this work, viz., to "burn out," "char," "scorch," etc., are so needlessly severe. Messrs. Root, for instance, advise charring infected hives brown or black, but add that it is not necessary to char deep in order to destroy foul-brood germs. Now, how can anyone possibly think that it is? Really, one would think these germs were monstrous in size, and also burrowed deep into the wood, instead of being microscopic and, if present at all, lying on the surface.

So far, indeed, from its being needful to actually char the wood, the mere passage of an intensely hot flame (such as that produced by a good blazing-lamp) over the surface must instantly shrivel up anything approaching the minuteness of foul-brood germs. To scorch a hive brown and black is to depreciate it quite 50 per cent. in value.

What is really needed is the systematic passing of the flame over every inch of the surface, beginning at one corner, and moving the lamp to and fro, lowering it at the return just the width of the flame, and not, on the contrary, moving it about promiscuously, charring one place and leaving another perhaps untouched.

The great difficulty, however, is not the disinfection of the hive, because this can be done to an absolute certainty; but the disinfection of the bees. The disease accompanies the bees into the new or clean hive, either in the blood of the queen, in that of the workers, in the honey, or actually, it may be, on the tongues of the bees.

A swarm from a diseased stock (albeit the disease may be of a very mild type)

takes the disease with it into the new hive, although everything about that hive may be quite new.

In face of these facts I am quite unable to understand how it was that such an exceptionally able bee-keeper as the late Mr. C. N. Abbott consistently and persistently advocated the purchase of swarms by beginners, giving them plainly to understand that by so doing they avoided all risk of disease. There can be no such assurance, because hives with a mild type of brood-disease will throw off swarms, and good ones too, year after year.

Bee-keepers are advised that the use of napthaline, the washing out of hives with carbolic acid, the periodic or gradual renewal of combs, etc., etc., will or may prevent the inroads of brood diseases among their bees. In my opinion, not one of these precautions, nor all three combined, will do any such thing. Take the case of painting the hives over with carbolic acid, for instance. Now, what is the utmost that this can be expected to do? It may destroy any germs which might be adhering to the hives at the time of application only; but supposing, say, a week after this was done, a near neighbor bought a badly-diseased and weak stock, at a time when bees were inclined to rob, the result would probably be virulent blood disease in the hives, which the previous dressing with disinfectant would be utterly powerless to prevent. Please do not think I am advocating slovenliness. Very far from it; but it seems to me that the efficacy of these disinfectants, etc., is very much over-estimated. If the use of minute quantities of germicides in syrup were absolutely inhibitive of the growth of the bacillus, then one would think that their continued use would abolsh the disease; but is it so?

Notice Messrs. Root's method of cure and the inconsistencies to which it leads. After advising the bee-keeper to be most scrupulously careful to disinfect all appliances used, and to get all honey from a diseased stock well out of the way, they say they finally found relief by shaking the bees from their combs direct on to frames of foundation in a clean hive. Now, at any time in the honey season, when even a moderate flow was on, the thin nectar from the diseased combs would shake out all over the bees, and also on the new frames or board. Thus the bees are actually furnished with (presumably) diseased honey at the very outset. I feel confident that this method will not cure the disease.

Again, they say the bee-keeper who does not wish to sacrifice a quantity of healthy brood in the diseased hive may set it on the new lot until all healthy brood has been hatched. Now, if this will not effectually infect the lower (or turned out) lot, what will? Indeed, if the germs of brood diseases were of a distinctly beneficial kind (say, in the ripening of honey), would not this be the very thing a bee-keeper would be likely to do in order to inoculate the lower hive?

But, you may ask, what about the numerous cases of reported cures by these and other methods? My answer is that in all probability, and in by far the majority of cases, they were not radical cures at all. The disease was merely scotched, not killed, and was not rediscovered until it had made considerable progress, when the bee-keeper at once put it down to a fresh outbreak, instead of which the disease was absolutely continuous.

No wonder that many bee-keepers dread the visit of a competent foul-brood inspector! I feel as sure as I can be of anything without ocular proof that many an apiary now set down as healthy would have to go into the "black list" if such rigid inspection were made.

In conclusion, I am of the opinion that it cannot be too distinctly laid down that turning the bees out into a clean hive does nothing whatever, certainly, save

getting rid of the diseased combs, brood, etc.; but if those bees go into the new hive with the disease about them in any shape or form, it will, almost to a certainty, be reproduced in the very first batch of brood raised by them.

Rochford. S. P. SOAL.

[As an example of what we believe to be a very confused idea of the treatment of foul-brood by our British friends, we publish the above from the British Bee Journal, contributed by S. P. Soal, of Rochford. Our British friends seem hopelessly at sea in the cure of foul-brood. They worship disinfection as a fetich, and a great many seem to hold to the idea of the drug treatment, notwithstanding the many disastrous results that have followed. There is no practical remedy for foul-brood but the entire elimination of the disease from the hive. This means the entire removal of all diseased comb and honey therein. The bees cannot be disinfected and live. It is now a well established fact that the disease is carried by the honey. If this honey can be entirely removed from the bees, either by elimination or by digestion in the adult bee, you can accomplish a cure.

As yet we have not seen any remedy suggested that can compare with the McEvoy method in simplicity and effectiveness. We have learned much from our British friends in the past, especially in the matter of the natural history of the bee, but we are honestly convinced that we can teach them something in the matter of curing foul-breed. Why this remedy has not been accepted more readily by them is a puzzle to us. Our American friends have adopted it, and it is the only method in vogue by the U. S. inspectors. The McEvoy method is of Canadian origin, and Canada is British, and surely our British bee-keepers should not show a reluctance to learn something from us. They might at least try. They would save worry and expense.—Ed.]

RESULTS OF CO-OPERATIVE EXPERIMENTS WITH AUTUMN SOWN CROPS.

Four hundred and ten farmers throughout Ontario conducted experiments with autumn sown crops during the past year. Reports have been received from thirty-six of the counties of the Province. Those counties which furnished the greatest number of good reports of successfully conducted experiments were Middlesex, Huron, Brant, Norfolk and Muskoka. The experimenters deserve much credit for the good work which they have done, not only for themselves, but for the farmers generally. Average results of the carefully conducted co-operative experiments with autumn sown crops are here presented in a very concise form:

Winter Wheat.—Four varieties of winter wheat were distributed last autumn to those farmers who wished to test some of the leading varieties on their own farms. The average yields per acre of straw and of grain are as follows: Imperial Amber, 1.4 tons, 21 bushels; Abundance, 1.3 tons, 23.9 bushels; Bulgarian, 1.2 tons, 21.9 bushels, and Nigger, 1.4 tons, 21.9 bushels.

The Imperial Amber gave the greatest yield per acre in the co-operative experiments throughout Ontario in 1907 and 1908, as well as in 1909. It also came first in popularity with the experimenters in each of these years. The Imperial Amber will again be distributed throughout Ontario this autumn as one of the varieties for co-operative experiments. We distributed the Dawson's Golden Chaff for co-operative experiments throughout Ontario in each of twelve years, but not within the last three years. According to extensive inquiries which we have made this year, the Dawson's Golden Chaff is still the most popular and the most extensively grown variety of winter wheat in the Province.

Winter Rye.—The average yield of grain per acre of each of three varieties of winter rye distributed in the autumn of 1908, is as follows: Mammoth White, 28.1; Common, 22.1; and Washington, 19.6. In the experiments throughout Ontario, the Mammoth White surpassed the Common rye by an average of 5 bushels per acre in 1907, 5.4 bushels per acre in 1908, and 6 bushels per acre in 1909.

Fertilizers with Winter Wheat.—In the co-operative experiments with different fertilizers applied to winter wheat, the average yields of grain per acre for five years are as follows: Mixed Fertilizer, 25.2 bushels; Nitrate of Soda, 23.8 bushels; Muriate of Potash, 22.9 bushels; and Superphosphate, 22.7 bushels. The unfertilized land gave an average of 19.9 bushels per acre. The Superphosphate was applied at the rate of 320 pounds and Muriate of Potash and the Nitrate of Soda each 160 pounds per acre. The Mixed Fertilizer consisted of one-third of the quantity of each of the other fertilizers here mentioned . The usual cost of the fertilizers as used in this experiment is between four and five dollars per acre.

Fodder Crops.—In each of six years, the seed of Hairy Vetches and Winter Rye has been distributed throughout Ontario for co-operative experiments in testing these crops for fodder purposes. In the average of six years' experiments, the Hairy Vetches produced slightly the largest yield of green fodder per acre, but in 1909 the largest yield was produced by Winter Rye.

Distribution of Material for Experiments in 1909.

As long as the supply lasts, material will be distributed free of charge in the order in which the applications are received from Ontario farmers wishing to experiment and to report the results of any one of the following tests: 1, three varieties of Winter Wheat; 2, two varieties of Winter Rye; 3, five Fertilizers with Winter Wheat; 4, Autumn and Spring Applications of Nitrate of Soda and Common Salt with Winter Wheat; 5, Winter Emmer and Winter Barley; 6, Hairy Vetches and Winter Rye as Fodder Crops. The size of each plot is to be one rod wide by two rods long. Material for numbers 3 and 4 will be sent by express and that for the others by mail.

C. A. ZAVITZ.

O. A. C., Guelph, Ont., Aug. 18, 1909.

EXTRACTING AT HIGH SPEED.

No doubt many find the ordinary extractors very unsatisfactory, especially when the honey is thick. Of course, the gasoline engine solves the problem for those who can afford it, as with it, the reel runs much faster and steadier. My honey is extra thick this season (no free advertising intended) and I found it impossible to get nearly all the honey from the combs by using the crank on the drive shaft. After extracting about five supers I decided to make some improvement if possible. I placed the extractor about one foot from the wall and about six feet from the extractor I bolted a boxing taken from an old binder to the 4 inch by 4 inch studding in the wall. An 18 inch pulley with a 3-4 inch shaft was fitted into this boxing and a crank bolted onto the pulley. Then I took the crank off the extractor and put on a 7 inch pulley and connected the two by a two-foot belt. I think I get about five times the speed I formerly did and the work seems to be about one-fifth. I put the combs from the five extracted supers through again and I am sure I got ten pounds of honey, although I did not weigh it. I was afraid the extra speed would injure the combs, but I found to my surprise, that they came out in better condition than they ever did. I think it is because the belt gives a steadier motion than the crank on the shaft. I am sure it would pay many beekeepers to try this arrangement.

H. A. SMITH.

Palermo, August 5, 1909.

Chalmers' Observations

Winter cases.—The time wll soon be on hand when we will have to turn our attention on wintering cases, if we winter our bees outside, and it might be appropriate for me to give my ideas on what might be well-nigh perfection in this line, but before entering on the subject would like to refer to the wintering troubles which confronted both Mr. Leon C. Wheeler of Barrytown, Mich., and a good many others. (See May C. B. J., page 185.) Mr. Wheeler wishes "some of his friends to tell him wherein he made his mistake, as he had a number of colonies die in spring which showed bad signs of dysentery, and yet their stores were fine sealed combs of white honey." I cannot see that Mr. Wheeler made any mistake in preparing his wintering cases, only he used straw packing, which I consider one of the poorest packings we have. I question whether there is anything better than dry forest leaves, but I feel certain that the source of the trouble was in improper stores. Although Mr. Wheeler's bees had nothing but sealed stores in their hives when they gave out, yet that was not the condition of their stores in early winter. His bees, no doubt, had enough unsealed honey to keep them for some time, but before getting it all consumed, it got into an unfit state for bees to winter on and gave them dysentery, which when started, either kills the colony in winter or leaves the bees individually weak, so that they are not able to stand the spring work, and one bee after another dies until the hive is depopulated. Apart from starvation, there is no trouble so disastrous in wintering as dysentery, which, I believe, is the sole cause of spring dwindling, notwithstanding the fact that some will argue that carrying chilly water is one of the causes of spring dwindling.

I fail to see wherein bees carry what we may call chilly water. Go to where Nature has provided watering places for bees, and what do you find? You will find the bees sucking the water from the moistened earth and not drinking from the pool or stream as animals do, in fact, a close observer will often find bees standing with some of their feet in the stream and sucking the water from the earth b' the brink.

Now, John McEwen, your apiary, is near by a little river; would you please go down by its banks and see if I am not correct.

"Well, Chalmers, there is no use in that for I keep lots of artificial watering places for my bees."

Never mind that, John, you knew that we can lead a horse to the watering trough, but we cannot force him to drink, and it is just the same with the bees. We may prepare a great number of watering places for our bees, but the water carriers won't by any means all go there. I keep saltish water for mine in the yard too, and yet find some of them carrying water from leaky banks about half a mile distant.

As to wintering cases, I think probably the writer got out one this last winter which has most, if not all, the main requisites. My aim was to get up a case which could be left with the bees right along, having three or four reasons for such an idea. In the first place, it saves the trouble of removing in spring and replacing in fall.

Secondly—When never lifted bees are not annoyed by the different appearance of their home and lose no time thereby as is the result when their wintering case is removed.

Thirdly.—In reality the case don't take up as much room if left with the bees as if piled away.

Fourthly.—When not removed it makes an excellent shade.

The only objection that can well be found to this plan is that it requires special storage for the winter packing. Some I know would like the packing to

remain permanently, but let me tell you, friends, that bees suffer from the heat in permanent packed hives, more especially if not in the shade of a tree, and then again, I consider it more beneficial when re-packed every fall.

Some of the properties of the wintering case in question are these:

It can be tilted from the back and allow the bottom board to be cleared off in spring. This part of the idea was copied from Mr. Wm. McEvoy. When visiting at his place three years ago, it amused me to see Mac raise his wintering case from the front and sweep out the dead bees, etc. The only trouble that I noticed was that the packing was disturbed, but in the coming case that trouble is overcome.

I have copied, too, from our lamented friend, the late E. W. Alexander, in that there is a feeder at the rear of the stand which can be used whether the hive is packed for winter or not. The only difference from Mr. Alexander's is that it slides to and from the hive, and by this means the hive can be ventilated in hot weather and not admit much light.

Part of the back of the case is removable to accommodate manipulation.

There are tin slides in front for contracting or enlarging the entrance, leaving the entrace at the hive full width of the hive all the time.

The bottom board just comes flush or barely so with front of case. It was my intention to extend the bottom board one-half to two inches, and hinge to it an extended alighting board, which was to fold up to protect the bees from storms in winter and shade from light in early spring; but found it could not be done and began reasoning in my own mind whether an extended bottom board is of any advantage or not; thinking of the bees in their natural homes in the woods getting along without an extension to alight on, and believing that bees will alight easier on themselves on a perpendicular surface than on a horizontal plane. To prove this, place a shingle at the entrance of a good colony, slanting up to the bottom board, heavy end resting on the earth, and you will hear heavily laden bees alighting at a distance of three or four feet. Does it not stand to reason that it will be easier on them alighting on a perpendicular surface when we consider that they are assuming almost a plumb attitude just as alighting? On these considerations, I made the case without an extension in front, but the space from the bottom board to the earth is filled with a board the width of the depth of the space and the length of the width of the hive; tack to one side of this two pieces of leather near each end, which also want to be tacked to the front of the bottom board, acting as hinges, to allow this little board to be folded up over the entrance, and yet is held off by those leathers or hinges far enough for ventilation and to allow the bees egress and ingress in emergencies (such as a warm day coming and the bee-keeper absent) and yet protects the interior of the hive from snow and winds and keeps it fairly dark as the entrance is indirect.

I find that leather will answer better for hinges than iron, as the latter is too slippy for the bees when new, and after a while will rust and refuse to work.

Now, I don't try to claim that this case will have any particular virtue in wintering; all that I claim for it is that it has about all the requirements considered necessary in a wintering case.

There has been no patent applied for nor will there be, but I don't wish bee-keepers to be writing me privately about it. If cuts of the different parts could be given in the C. B. J.,if not too much expense on friend Hurley, I would write it up for the readers of this paper or describe it to some manufacturing firm who could make them and from whom samples could be bought. It will, no

doubt, be a little expensive, but most bee-keepers could make their own if they had a model to go by, although a firm will make them cheaper if made from new lumber.

DAVID CHALMERS.

CELLAR WINTERING AND SPRING PROTECTION.

My cellars are 15 x 15 feet inside, with entrance or hall way 3 x 8 feet, opening into another room 15 x 15 feet, and from this outside through an alley 3 x 6 feet, There are three doors each 3 x 6 feet, and made double with an air space. These are placed one at each end of the hall way and one at outside entrance.

This cellar is entirely underground, the ceiling being two feet below the outside level, and this space filled with sawdust. Then I have a honey house and shop over the entire cellar 15 x 39 ft., and a storage room upstairs of the same size. With this cellar the temperature has never varied more than one degree from time of putting bees in in November until time of taking them out in April.

One spring I did not get the bees out until April 27th, they being confined in the cellar for five months and four days, still the temperature did not go above 44 nor lower than 43 and this without any ventilation.

I have a large brick chimney from cellar floor up through the building and tile intake running 150 feet underground to the side of hill outside, but have never used them while bees were in the cellar.

I find that ventilation is unnecessary when temperature can be kept about 43 or 44 and cellar is reasonably dry. This building is built entirely of concrete.

I always try to take bees out of the cellar on a bright day, when the temperature is not lower than 60, so that bees can have a cleansing flight and get settled down again before it is too cold. Then I put on each colony an outside case, made large enough to allow a two inch space clear round all sides, also on top. This I pack with dry sawdust taken from over the cellar as noted above. I find that this is much better (and it pays big), than leaving without protection or wrapping with paper or packing with straw or chaff, as the dry sawdust holds the heat much better, and saves many colonies that would otherwise perish or spring dwindle during the cold spring weather, which we have in this latitude (44). I have wintered three-frame nuclei in this cellar the past winter, and put them on the summer stands April 5th, and packed as described above, and have taken as high as 150 lbs. of honey per colony from some of them. My average this season to date is 116 lbs. per colony (clover honey only), and this all choice, it being left on the hive until it was well capped over.

I wish to emphasize the fact that it pays to pack all colonies with dry sawdust after setting from the cellar, as it helps greatly in retaining the heat and thus increases brood rearing and insures strong colonies for the harvest when it comes.

DAVID RUNNING.

Grindstone City, Mich.

HE FILLED THE CAN!

The bee-man went to his honey house,
With a sixty-pound can to fill;
He put the can under the honey gate,
And thereon hangs a thrill!

The hole in the tap was rather small,
And the honey came very slow;
The busy man looked down at the stream,
And then said, "Well, I may go."

It will take a long time to fill that can,
And while it is trickling out
I can mow the lawn and paint some hives
And turn the chickens out."

He off threw his coat and went to the barn,
And oiled his friend, the lawn mower;
But as he started to run the machine,
His wife appeared at the door.

"John, come here; I want you, dear,
To split and bring in some wood,
The stuff you brought in this morning is wet,
And does not burn a bit good."

John took in the wood, some water also,
And did several other chores;
But what of the honey out in the can?
Why, it was running, of course.

Now, John took hold of the mower again
And started to cut the grass;
But a board was there; he knocked it down,
And broke a big pane of glass.

His wife heard the noise and ran to the door,
To see what on earth was the clatter,
But there was John mowing the lawn,
As though nothing was the matter.

"Well, well," said his wife, "of all the men
I ever saw, he's the limit;
He'll smash the place to pieces yet,
He'll hear from me this minute!"

John cut one swath around the lawn,
Returning to the window;
And when he got there, I do declare,
His wife got off a lingo.

She wound up sending him off to the store,
To get some putty and glass;
But what of the honey down in the house?
O, my! Alas, alas!

The can had been filled for over an hour,
And still the honey ran out;
It had covered the floor and run through the cracks,
There was an ocean of honey about.

But John fixed the glass and mowed the lawn,
And started to paint some hives;
He forgot all about the honey out there,
He was thinking about cross wives.

Presently a lady came round where he was,
She had a honey jar to fill;
When John saw the jar, he remembered the tank,
And it made him feel quite ill.

He dropped the jar and ran for his life,
Down to the honey house;
When he opened the door he was met by a flood,
Poor John felt small as a mouse.

His season's crop was before his eyes,
O, yes, it was spread out nice;
But it was not in a marketable shape,
And would bring a rather slim price.

John made a vow right then and there,
That hereafter, for all time to come;
When he wanted to fill a honey can,
He would sit and watch it run.

THE 8-FRAME LANGSTROTH vs. DADANT HIVE.

By J. E. Hand in American Bee Journal.

In these days when the majority of people are blindly following the largest crowd regardless of whither it is leading them, and when men of original thought and independent action are none too plentiful, it is very refreshing to meet a man who has the courage to stand by his honest convictions, even though he stand alone. Such a man is my worthy and honored opponent, Mr. C. P. Dadant.

While I have great respect for Mr. Dadant's opinion upon subjects pertaining

to apiculture, yet different people view things from different standpoints, and therefore see them in a different light. In this way a dignified discussion if conducted in the right spirit can result only in good, since it must reveal some points that can not be seen from one particular point of view.

Viewing the Dadant hive from the standpoint of the comb-honey producer in the average location, it is weighed in the balance and found wanting. Therefore, it does not possess the necessary qualifications that should recommend a hive to a class of bee-keepers that represent by far the greater majority of the bee-keepers of this country.

Mr. Dadant is viewing his hive from the standpoint of the extracted-honey specialist, who represents a very small part of the bee-keepers of this country. Viewing the Dadant hive from the standpoint of swarm-control, its claims can not be substantiated in the production of comb honey. An extracted-honey hive must have something besides its size to recommend it. Therefore, the 8-frame Langtroth hive must ever remain what it is—a general utility hive—the hive that is best suited for the masses.

The Dadant hive is too heavy to be carried in and out of the cellar. Therefore bees in these hives must be wintered out-of-doors, which necessitates a great amount of frame manipulation in the fall in equalizing and uniting small colonies. Mr. Dadant admits that he finds some difficulty in increasing his bees enough to make up for winter losses, which is in itself rather significant.

My worthy opponent has fallen into a common error among large-hive advocates, in assuming that a large hive always contains a large colony of bees, while just the reverse is quite apt to be the case.

If a hive is made large enough to develop the fertility of the best queens, the average queen can not keep it filled with brood. Hence, it becomes a storehouse for honey. This condition of things is followed by a long train of evils, such as swarming, crowding the queen, loafing on the outside of the hive, refusing to enter the super, etc. And the bees will continue to crowd the queen until the breeding space is far more limited than it would be in an 8-frame hive. Thus the largest colony is quite as likely to be found in an 8-frame hive as in a Dadant hive.

Perfect control of bees is only to be found in a hive in which the size, shape, and methods of manipulation are correctly and scientifically balanced. Such a hive is the 8-frame Langstroth hive of to-day.

When bee-keepers learn that bees can be controlled only through their instincts they will be in a position to understand that perfect control of bees is out of the question with a hive in which the room in the brood chamber exceeds the fertility of the queen. Here is where the 8-frame hive wins out in an easy pace.

The fact as stated by Mr. Dadant that his neighbor's bees in 8-frame hives became over crowded with bees by May 15, and cast swarms every year, while Mr. Dadant's bees seemed to have plenty of room, and cast few swarms, is rather significant, and proves two things quite conclusively. One is, that the 8-frame hive is a splendid hive for building up rapidly in the spring, and the other is that the neighbor above mentioned has much to learn about bee-keeping methods. If the owner of those bees knew enough to give them a set of half-depth brood-combs at the right time, they would not have swarmed, and would have rolled up an amount of surplus that would have made the Dadant hive man stand up and take notice. And why not, for they are then larger than the Dadant hive, and in much better shape for rapid breeding up, since the additional room is in the warmest part of the hive—right over the brood-nest—which enables the bees to care for twice as much brood as in a

Dadant hive, where they are compelled to extend the brood-nest sidewise into the coldest part of the hive, far removed from the heat centre, and therefore could not be expected to build up strong enough to cast swarms before July. I believe Mr. Dadant's success with these hives is largely due to the fact that a large part of his surplus is gathered late in the season.

The 8-frame hive of to-day is as different from the 8-frame hive of a quarter of a century ago, as the Dadant hive is different from the long-ideal hive.

The modernizing influence of the sectional hive is slowly but surely revolutionizing the bee-keeping methods of this country, and it is these influences that have made the 8-frame Langstroth larger than the Dadant hive when a large hive is needed, and smaller than any other when a small hive is needed. And all the while it is the common utility 8-frame Langstroth hive of to-day—the hive for the masses of bee-keepers of America.

Birmingham, Ohio.

HONEY CROP COMMITTEE REPORT.

Parliament Buildings,
Toronto, August 3, 1909.

Dear Sir:—

The honey Exchange Committee of the Ontario Bee-Keepers' Association met at the Secretary's office in Toronto to-day. Reports were received from a large number of points throughuot the province, covering about 15,000 colonies, and the committee were enabled to get accurate figures for comparison with previous years.

It was found that the average production per colony the present season was 59 pounds, as against 55 last year. The honey is of much better quality throughout, and a greater consumption may be looked for. All old honey is practically cleared up both here and in other provinces. With a light crop only in the United States, and a greater demand in the West due to this fact and also to a good harvest, much more Ontario honey should find a morket there at reasonable prices both to producer and consumer.

The lower prices of fruit in Ontario, due to large crops and the slight increase in the producton of honey mentioned above, warrant the Committee in recommending a reduction in the prices, both for extracted and comb, to the following:

No. 1 Light Extracted (wholesale) 9 1-2c to 10 1-2c per lb.

No. 1 Light Extracted (retail) 12 1-2c per lb.

No. 1 Comb (wholesale) $1.80 to $2.25 per dozen.

No. 2 Comb (wholesale) $1.50 to $1.75 per dozen.

The Committee would suggest to the bee-keepers to retain a portion of their crop until later in the season, so as to more equitably distribute the honey throughout the season, and supply the later demand, which will ensue as a result of the splendid quality of this year's crop.

As in 1908, a later report will be issued to cover the buckwheat honey.

Yours very truly,
WM. COUSE, Streetsvlle.
W. J. CRAIG, Brantford.
H. G. SIBBALD, Claude.
P. W. HODGETTS, Secretary.

REARING QUEENS.—WHAT IS HONEY DEW?

Would you kindly answer through the Journal the following questions: 1st, Could you give the Pratt method of rearing Queens as spoken of in Mr. Alexander's article on "Comb Honey" in June issue? 2nd, Could you describe honey-dew honey; its color, and, if possible, its taste?

A READER.

[1. The system of queen rearing advocated by the late E. L. Pratt differed

from others then in use, in that he used a very small quantity of bees for caring for the queens during the time they were mating. In this method the ripe queen cells are hatched out in individual nursery cages and when the virgins are a few days old they are introduced to a small lot of queenless and broodless bees. Mr. Pratt also invented a number of apparatus for use in queen-rearing, all of which are described in the Swarthmore books, published by the A. I. Root Co.

2. We personally know little of honey dew. We have seen it on the sidewalk and the trees, but we have never had it in the hives in such quantities as to know what its color or taste is. Some one of our readers who know something about it would confer a favor by letting us know. Honey dew is thought by some to be a juice or gum, exuding from the leaves of certain trees. This seems not to be the case according to the best authorities. Honey dew is the result of the work of aphids on the leaves, the juice of which they suck. A plant louse or green fly; any stenorhynchan homopterous insect. They multiply by parthenogenesis, and are very prolific. A virgin female may give rise to millions of progeny in two generatons. They have two tubes on the abdomen from which the so-called honey dew exudes. Ed.]

CANADA CENTRAL FAIR.

Finest Exhibition in Association's History—Over $16,000 in Cash Prizes and Many Specials. — Magnificent New Grand Stand, Seating over 12,000—Return to Night Spectacular Production Many New and Attractive Features.

This year's fair of the Central Canada Exhibition Association to be held in Ottawa from September 10th to 18th will eclipse all predecessors in the extent and magnificence of its exhibits, the improvements effected and the attractions and prize lists provided. Immediately after the conclusion of last year's exhibition the directors started in to prepare for the coming one and their labors are now well advanced. People from this district who go to the fair in September will notice many noteworthy improvements and changes all of them calculated to make this great annual institution more interesting and attractive than ever.

Special mention should be made of the new fireproof grandstand admitted to be one of the finest on the continent. It replaces the old stand burned down two years ago and is a structure providing not only vast accommodation, but serving also as one of the most picturesque features of the grounds. The stand is 500 feet long, built of solid steel and concrete and has seating capacity for twelve thousand people. Underneath it are located numerous dining halls and refreshment booths and also a fire station with equipment for the protection of that section of the city. The cost is to be $80,000, and the work now being rushed will be completed in good time for the fair.

Then the prizes. The list this year has been carefully revised in all departments and the cash prizes which are offered total over $16,000. About fifty gold medals and special prizes are equal in value to another thousand, and there is every incentive to exhibitors. Not only are the prizes lucrative and attractive, but the accommodation and facilities are of the best. That this year's fair is to be a great success is evidenced be the fact that already practically the whole main building space has been spoken for and the exhibits usually placed there exclusively will overflow to other structures.

BEES IN RELATION TO FLOWERS AND FRUIT CULTURE.

The primary object of this chapter is to bring under the notice of our orchardists and others interested in fruit-growing the immense value of the cross-fertilization of fruit-blossoms in the production of fruit, and to show the important part the hive-bee plays in bringing this fruit. In order the better to realize the complex mechanism of flowers, and the wonderful process of fertilization, and so to appreciate the effects of cross-fertilization in the orchard, I deem it necessary to touch upon these points before dealing directly with the main object.

Insect-life and plant-life are almost entirely interdependent upon each other. Insects obtain sustenance and, in most cases shelter from the vegetable world, while plants of most kinds are mainly dependent upon insects for the propagation of their species. A host of insects, large and small, of which the hive-bee is the most important, feed chiefly on the saccharine matter secreted in the nectaries of blossoms; and some of them (the hive-bee in particular) require for their own food or for that of their young a good deal of farinaceous matter supplied by the fecundating dust of the anthers of the same blossoms, termed "pollen." On the other hand, it is necessary for the proper fertilization of the plant that such fecundating dust be brought from some other plant of the same species should come in contact with its pistils, and this is effected by the agency of insects chiefly.

Sexual Organs in Flowers.

In flowers there are organs analogous to, though widely differing from, those indicative of sex in the animal kingdom. The functions at least are the same; and the combined action of the two sets is essential to the propagation of the race by seed.

In this connection it is interesting to note the remarks of the late F. R. Cheshire. He said:

Blooms are produced by plants in order that seeds may flower, and so the race be continued. Two parts are essential to this reproduction—the anther and the pistil, the latter very generally occupying the central position. The anther is usually a double-celled pouch, the contents of which by segementation break up into a number of perfectly similar parts called "pollen-grains," which though minute are complex in structure. When these are mature the anther splits or dehisces (to open) and the pollen escapes, but it needs in some way to be applied to the termination of the pistil, called the "stigma." When this application is effected, the pollen-grain absorbs moisture, its interior portion swells, and actually throws out the tube which often grows to a great length in making its way towards the unimpregnated nucleus of the ovule, which is situated in the ovary at the base of the pistil. In this nucleus a large cavity filled with protoplasm has devloped, called the "mother-cell," within which we find the embryonal vesicle to which the contents of the pollen-grain is transferred by the channel of the pollen tube. This is fertilization, and upon it depends the production of seed, for the new individual plant has its beginnigs from this interfusion.

Most flowers are hermaphrodite, or double-sexed—they contain both the stamens (anther-bearers) and pistils within the same calyx or on the same receptacle; but there are some species where the sexual organs, male and female, are found by different individual plants, so that some agency for the transference of the fructifying pollen-grains is absolutely necessary, or the species would soon die out. Many of the latter are anemophilous (wind-fertilizing plants), with inconspicuous flowers yielding no nectar, therefore not attractive to insects. In these cases

nature provides the male blossoms with an abundance of pollen-grains, which are wafted by the wind to considerable distances, and so are likely to reach female blossoms and fulfil their all-needful function.

Mechanism of Flowers.

Darwin and others have proved that "cross-fertilization is a most important factor in the continued vitality of any species of plant, and gives an enormous advantage in the struggle for existence where the conditions of life are not wholly favorable." In the hermaphrodite or double-sex flowers, where self-fertilization is possible, Nature has provided in most cases some wonderful contrivances to prevent it, and to insure cross-fertilization by the transference of all-potent pollen-grains from some other plant of the same species.

The adaptability of the hive-bee to the work of cross-fertilization seems most marvellous, when we realize that in its separate expeditions in search of nectar and pollen it keeps to the flowers of the same species, otherwise its visits would be of no service in most cases, and probably detrimental in many.

On the subject of hermaphrodite flowers, Cheshire says—

An examination of most blooms will show that the essential organs before referred to (anthers and pistils) are so placed that an accidental or unaided transfer of pollen to stigma is unlikely, and where this arrangement of parts is not found it frequently occurs that the anthers ripen and dehisce much before, or not until some time later, the stigma has so matured as to be ready for pollination. In the former case, as we may observe in the common garden nasturtium (Tropœolum majus), the pollen is all carried away by insects by the time the stigma presents itself so that if fertilization be effected it must be through the bringing of pollen from some other blooms still shedding it. Insects are the means which accomplish this, and to secure their visits the blooms spread them a banquet

In the common sage (Salvia officinalis) both the stamens and the pistil are of a very peculiar form, and the latter is not fully developed and ready to be fecundated until after the anthers of the same blossom have shed their pollen.

The anther-cells, instead of being close together, are at the two ends of a long connective, which is attached by a sort of pivot joint at about one-third of its length to the stalk of the stamen. The lower anther-cells contain very little pollen, sometimes none at all, while the upper ones are fully developed as shown in the figure. When the bee thrusts its head into the tube, it presses against the lower cells and pushes them back; the connectives revolve on their axis, and the upper anther-cells are brought down on the bee's back, the hairs of which brush off the pollen, which the bee carries away, and as soon as it meets with an older blossom, in which the pistil is fully developed, it is evident that upon entering the tube of this blossom the pollen already on the bee's back must be rubbed against the stigma, and the cross-fertilization be thus effected.

In Relation to Fruit-Culture.

Professor A. J. Cook, the well-known American entomologist and apiarist, author of "The Manual of the Apirary," formerly of Michigan Agricultural College, and now of Pomona College, California, who has paid particular attention to this subject, extending over a long period, says:

"Bees never harm blossoms, but are always a help. Bees are a tremendous aid through pollination. Many of our best fruits must be cross-pollinated to produce. Many pears, apples, and plums, etc., are utterly sterile to their own pollen. Bees are alone numerous enough to effect this valuable service. I am sure that it is an incontrovertible fact

that bees as the great agents in pollination are far more valuable to the world than the honey they produce. The best orchardists (in California) now arrange with apiarists to bring their bees to the orchards; they find they must have the bees."

Coming from such an authority, this is eminent testimony as to the value of the hive-bee to orchardists.

Conclusive evidence in this respect came under my own observation. In the winter of 1882 I started a bee-farm at Matamata, and had about one hundred colonies of bees when the fruit-blooming season came on. The apiary was located close to a mixed orchard of large trees, covering some 10 acres. The nearest bush was about five miles distant, I should judge, and, the orchard being in an open plain, there was no shelter for wild bees nearer than the bush, so that it is not at all likely that the orchard was ever visited by bees. I was informed that though the trees blossomed abundantly each season, the trees bore very little fruit, that the whole ten acres did not supply enough fruit for the station. The result in that and subsequent seasons, by the aid of my bees, was that the trees had to be propped up in all directions to keep them from breaking down under the weight of the fruit.

Mr. R. T. Morrison, of Messrs. E. Morrison & Sons, Warkworth, well-known horticulturists, supply the following interesting note regarding cross-pollinating experiments, which have been carried out at their orchards:

Three seasons ago a small pear tree was selected for operations. When the blossom buds were in right condition—namely, when the petals of a large proportion of the blossoms were almost ready to break open—the blossoms and blossom-buds were thinned out to, roughly speaking, about one-sixth of what the tree originally held, leaving only such as would open into full flower in about a day or two. These petals (all being of unopened blossoms), together with stamens and in some instances calyx also, were then removed, and the tree was covered with butter-cloth. In a few days polen of another variety of pear was administered to the stigmas, being placed there by hand, and not shaken on, and the tree was again left covered with buttered cloth. This pear-tree set and matured a large crop of fruit—in fact, too large—while other trees of the same variety alongside set practically nothing.

Two seasons later (that is in 1905) this same tree was treated in the same manner, except that blossoms were thinned down to about one-tenth; butter-cloth or other covering was not used; and pollen from another variety (that is a different variety from that from which pollen was taken for the previous experiment) was made use of. Though no covering was used it would appear that the bees would not be likely to much visit a tree from which the petals had been entirely removed. Still, almost every blossom that was treated seemed to set, and the result was a crop much too heavy. Other trees of the same variety alongside had a fair crop, but not nearly so heavy as this one.

Other experiments with various fruits have been carried out at different times with varying success The above instances are perhaps the most striking.

I may mention that bees are very busy agents in our orchards during the blossoming season, when the weather is fine enough. Still, it would be too much to expect that the bees would always be able to carry the right pollen to the right trees at the right time. But no doubt the bees would be even of much more value in the orchard than they are at present if we had the knowledge as to which varieties of a fruit were best for fertilising other varieties, and were to lay off our orchards in such a way as to give the bees the best opportunity of

carrying pollen from one variety to the other.

An eminent authority, when speaking of the fertilisation of apple-blossoms, said:

The apple is called by botanists a pseudo-syncarpous fruit, because it may be regarded as five fruits gathered into a unit by an envelope formed by a development of the calyx. If an apple be cut across we see five compartments or dissepiments in the core, each one of which should contain pips or seeds. The blossom which preceded the fruit had five stigmas, three of which remain in section, and each one of which communicated with a dissepiment or partition, and required an independent fertilisation. Bees seeking honey would, by getting their breasts (furnished as they are with abundance of long webbed hairs) thoroughly dusted with apple pollen, and flitting to a bloom whose stigma had reached the receptive condition, bring about fertilisation. It would, however, frequently happen that three or four of the stigmata only would be pollinated. In this case an apple, though an imperfect one, would be produced. Trees agitated by the winds frequently drop a number of their fruits, hence known as "windfalls," but the actual cause of droppings is in by far the largest number of instances defective fertilisation.

Cheshire says in his "Bees and Bee-keeping" (Vol. i, page 323): "I had two hundred apples, that had dropped during a gale, gathered promiscuously for a lecture illustration, and the cause of falling in every case but eight was traceable to imperfect fertilisation. Such fruits are readily recognized by being deformed, a part failing to grow from the want of perfect fertilisation. Cutting one such apple across, no seed will be found opposite the undeveloped part. These facts taken together show conclusively how completely our fruit-crop is dependent upon insect agencies, and amongst these the hive-bee takes the most important place."

In the case of the strawberry—and the same applies to the raspberry and other berry fruits—each little achenia (popularly known as seed) dotting its surface possesses a style and stigma. The stigma of each of the achenia must be fertilised to produce a perfect fruit; otherwise, if this is but partially accomplished, the part unfertilised remains undeveloped — hard, shrunken, and green—when the fertilised portion is fully ripe. Almost any dish of strawberries will furnish such examples

When we consider that, according to Cheshire, it requires from 100 to 200, or even 300, distinct fertilisations to produce a perfect strawberry, we can realize how necessary it is to have the agents for such fertilisation near at hand when the plants are in blossom. Gooseberries are absolutely dependent on insects, and in fact all fruits are dependent upon outside agencies for their growth and development.

It is well to note here a statement in Cheshire's work that I have not noticed elsewhere, viz.; "There is a tendency to a separation of the sexes in the cultivated strawberry, which Darwin observes "is far more strongly marked in the United States than in Europe"; and growers will do well to note that plants bearing unusually large blossoms are frequently tending to become male, and produce few fruits, while those of the same variety and under the same treatment that produce small blossoms are tending to become female, and are abundant bearers, while they yield few runners. Without care in selecting, the numerous runners of the former would ultimately supplant the female forms, and so ruin the stock for economic purposes.

When lecturing to some of the large growers of strawberries in the United Kingdom, Mr. Cheshire found them all quite unaware of the above tendency.

New Zealand growers are not, I should imagine, ignorant of a fact of so much importance to their success, but I think it well to quote the paragraph.

"At the Waerenga Government Experimental Station there is a young orchard of about 40 acres, and as there is no shelter for "wild" bees less than nearly six miles distant, I have suggested that fifty colonies of bees should be established near by for cross-fertilising purposes."

I may also quote the following authorities: Professor L. O. Howard, Chief of the Division of Entomology, Department of Agriculture, United States of America, in his introduction to Bulletin No. 1 on "The Honey-Bee," third edition, issued in 1899, says of bees and bee-culture:

"This branch of agricultural industry does not impoverish the soil in the least, but, on the contrary, results in better seed and fruit crops. The total money gain to the country from the prosecution of this industry would undoubtedly be placed at several times the amount given in a table above (20,000,000) were we only able to estimate in dollars and cents the result of the work of bees in cross-fertilising the blossoms of fruit-crops. In support of this it is only necessary to refer to the fact that the recent investigations of another Division of this Department have shown that certain varieties of pear are nearly or quite sterile unless bees bring pollen from other distinct varieties for their complete cross-fertilization.

Professor Baily, Horticulturist of Cornell University, says:

Bees are much more efficient agents of pollination than wind in our fruits, and their absence is always deleterious.

Mr. C. A. Green, writing to The Fruit-Grower published in Rochester, N. Y., said:

"It has now become demonstrated that many kinds of fruits, if not all kinds, are greatly benefited by bees, and that a large portion of our fruit—such as the apple, pear, and particularly the plum—would be barren were it not for the helpful work of the honey-bee. Professor Waite, of the Agricultural Department, Washington, covered the blossoms of pears, apples and plums with netting, excluding the bees, and found that such protected blossoms of many varieties yielded no fruit. In some varieties there was no exception to this rule, and he was convinced that large orchards of Bartlett (William's Bon Chritien) pears, planted distant from other varieties, would be utterly barren if it were not for the work of the bees, and even then they could not be profitably grown unless every third or fourth row was plated to Clapp's Favorite, or some other variety capable of fertilizing the blossoms of the Bartlett. In other words, he found that the Bartlett pear could no more fertilise its own blossoms than can the Crescent Strawberry.

And again, Professor Waite, when speaking of insect-visits to pear-flowers, says:

"The common honey-bee is the most regular, important and abundant visitor, and probably does more good than any other species;" And sums up as follows: "Plant mixed orchards, or, at least, avoid solid blocks of one variety. Be sure there are sufficient bees in the neighborhood to visit the blossoms properly. When feasible, endeavour to favour insect-visits by selecting sheltered situations, or by planting windbreaks."

The editor of The Rural New Yorker says:

"In those great greenhouses near Boston, where early cucumbers are grown, it is always necessary to have one or two hives of bees inside to fertilize the flowers. No bees, no cucumbers! unless men go around with a brush and dust the pollen from one flower to another."

Spraying Fruit Trees While in Blossom.

I do not know that it is necessary to say much on this subject, as I dare say

our orchardists are well aware that spraying trees with the usual poisonous mixtures while in blossom is not only injurious to the blossoms themselves by destroying the pollen, but also poisons the bees which visit them, thus defeating the object every orchardist should keep in view—the cross-fertilisation of the blossoms. In a number of the American states there are laws against doing so.

Fortunately, the ignorant prejudice against bees common some years ago amongst viticulturists and other fruit-growers is fast dying out. It was believed at one time in America that bees punctured and destroyed grapes and other delicate fruits, and, notwithstanding that the results of exhaustive experiments conclusively proved the contrary, it took a long time to convince them they were wrong. Bees cannot puncture sound grapes, but during a dearth of honey they will suck the juice from ripe grapes and other fruits after they have been punctured by some other animal, or have burst through over-ripeness. Sound grapes smeared with honey have been put into a hive containing a starving colony of bees; the honey has quickly vanished, but not a grape has been injured. Bunches of ripe grapes have been left in four or five hives at a time, directly in contact with the bees, and after three weeks every grape was perfectly intact, but glued to the combs.

I could go on quoting the opinions of many other able authorities in the same strain, but enough has been said to convince orchardists, if it were needed, that it is vital to their interests either to keep bees or to see that there are plenty in the neighborhood of their orchards. It remains only for me to say to those who wish to follow up their investigations on this subject, I would recommend them to read the works of Darwin, Mulled, Lord Iveagh (Sir John Lubbock, and Cheshire.

I would point out that in New Zealand we have not the number of fertilising insects there are in Europe or America, consequently we are even more dependent on the hive-bees than are orchardists in those quarters of the globe. I think I am correct in saying there are practically no other insects but the hive-bees about in New Zealand when fruit-trees are in blossom. Finally, as a summary, I will quote the conclusions of Herman Muller on the comparative value of bees as fertilisers. He says in his great work on "The Fertilisation of Flowers,"—

"Bees, which not only feed on the produce of flowers, but nourish their young also thereon, are in such intimate and lifelong relations with flowers that they show more adaptation to a floral diet, and are more important for the fertilization of our flowers, and have, therefore, led to more adaptive modifications in these flowers, than all the foregoing orders (of insects) put together.

Bees, as the most skillful and diligent visitors, have played the chief part in the evolution of flowers; we owe to them the most numerous, the most varied, and specialised forms. Flowers adapted to bees probably surpass all others together in variety of color. The most specialised, and especially the gregarious, bees have produced great differentiations in color, which enable them on their journeys to keep to a single species of flower. While those flowers which are fitted for a miscellaneous lot of short-lipped insects usually exhibit similar colors (especially white or yellow) over a range of several allied species, the most closely allied species, growing in the same locality, when adapted for bees, are usually of different colors, and can thereby be recognised at a glance (e. g., Trifolium, Lamium, Tenerium, Pedicularis).—Isaac Hopkins.

Remember—bees have no food where they are rearing their babies. Feed them.

Would you know this Inspector by his Newton(ian) Mustache ?

CÆSAR'S STRONGHOLD.

(By a Banker.)

In a recent article of this series reference was made to the numerous Norman castles still to be seen in various parts of Britain. Almost equally numerous, and in some instances probably practically unaltered since the time when they were garrisoned by thousands of Roman legionaries, the fortified camps occupied by Julius Cæsar fifty years before the commencement of the Christian era, and by his successors for several centuries, still exist both at various points round the coast, and also in many inland positions where an isolated lofty hill dominating

the surrounding country has been upreared by some great convulsion of nature.

As an interesting example of these great intrenched strongholds "Cæsar's Camp," near the Kentish coast, may be mentioned. A conical lofty hill several hundred feet in height, a mile or two in circumference, surrounded, near the summit, with a double line of deep fosses, or dry moats, in the lower of which traces remain of a galery upon which the Roman archers could stand concealed from the foe beneath, its sides in places almost perpendicular, this old Roman fortified camp must have been well nigh impregnable.

And the exertion of scaling this "sugar-loaf" hill is amply repaid by the glorious view obtained from the summit. Standing perhaps on the very spot whence Julius Cæsar directed the operations against our skin-clad ancestors, the country around is spread out like a map. On one side pastures and woods, farmhouses and villages, golden corn fields ripe for the sickle, contrasting with the vivid green of adjoining fields, with here and there the square tower of some church erected either by the Normans, or in some few cases in the somewhat later period when the bold circular columns and rounded arches and windows of that period gave place to the more florid so called Gothic style of architecture. On the other side, bordered by the terraces and churches of a fashionable watering place, the broad ocean, flecked with craft of all sizes, from the mighty liner or the mailed battleship, to the brown sailed fishing boat, sailing out in quest of the harvest of the sea, glitters and sparkles in the sun's rays.

And, causing an added exhilaration, the delicious and fragrant air of the downs, redolent with the perfume of wild thyme, centaury, and other wild flowers, invigorates and gladdens and causes a

thrill of exultant emotion to course through the veins. And, amidst all this loveliness and all this fascinating beauty, the mind "looks from Nature up to Nature's God," and a rush of allelujahs swells through the soul at the thought that the Creator of this lovely earth, in order to nullify the sentence passed by Immutable Justice against the sinner, Himself on Calvary made expiation for the sins of all who will but conform their lives to His will as expressed in Holy Writ, and who cast themselves at His feet, acknowledging Him as their Saviour and their Redeemer.

ADMIRAL BERESFORD.

Hero of Alexandria Will Open Canadian National Exhibition at Toronto.

Admiral Lord Charles Beresford, who has accepted an invitation to visit Canada to open the Canadian National Exposition at Toronto, is known to fame as the great leader in the national defence movement now agitating the whole empire.

Lord Charles, who is the second son of the Marquis of Waterford, first became known to fame at the bombardment of Alexandria when he sailed the little Condor into water too shallow for the big battleships and silenced a battery that was doing great damage to the British fleets. "Well done, Condor," was the signal that floated from the flagship after the battle, and the young Lord was known as "Condor Charlie," till more dignified titles crowded the name into comparative obscurity. Admiral Beresford can do other things besides fight. He has three medals for life-saving, has written a life of Nelson and several treatises on naval matters, is an all-round sporting man, and is known all over Britain as a warm-hearted Irishman.

Want and Exchange Column

Advertisements for this column will be received at the rate of 35 cents for 25 words, each additional word one cent. Payments strictly in advance, as the amounts are too small to permit of book-keeping. Write copy of ad. on a separate sheet from any other matter, and on one side of the paper only. Say plainly how many times ad. is to be inserted. Matter must reach us not later than the 23rd of each month.

HONEY WANTED—I would like to contract now for your this season's best comb and extracted honey. I can send you 60-lb. tins or can returns yours. I can handle all you have. It is essential that I have it as early as possible. G. A. DEADMAN, Brussels, Ont.

Central Canada Exhibition, Ottawa Prize List.

CLASS 78—HONEY AND APIARY SUPPLIES.

(In New Dairy Building.)

Exhibitors showing Honey not the product of their own apiary, in competition for prizes, shall forfeit any prizes awarded, and be debarred from exhibiting for two years thereafter. Bee-keepers who have supplies can exhibit such, but not in competition for prizes. Exhibitors will be allowed all possible space in New Dairy Building.

Only one specimen from any one apiary or apiaries under one management can be entered in each section. These rules will be strictly enforced by the Directors.

Special Prize by Geo. S. May, Esq., Vice-President, C.C.E.A., Ottawa, to the exhibitor winning the greatest number of first prizes in Class 78, Honey Department.

Sec.		1st.	2nd.	3rd.	4th.
1.	Best 20 lbs. of Extracted Granulated Honey in glass....	$6 00	$4 00	$2 00	$1 00
2.	Best 100 lbs. of Liquid Extracted Honey, in glass, quality to be considered	10 00	6 00	4 00	2 00
3.	Best 100 lbs. Comb Honey, in Section, fresh appearance and finish to be considered	10 00	6 00	4 00	2 00
4.	**Special Prize (value $6.00), by** The Cuzner Hardware Co., Ottawa, for best 100 lbs., Comb Honey, in Section.				
5.	Best 10 lbs. of Comb Honey, quality and finish to be considered; that is to say, body and flavor of honey, and clean and best filled sections, to be considered..	5 00	3 00	2 00	1 00
6.	Best 10 lbs of Extracted Clover Honey in glass	5 00	3 00	2 00	1 00
7.	Best 10 lbs. of Extracted Linden Honey in glass	5 00	3 00	2 00	1 00
8.	Best 10 lbs. of Extracted Buckwheat Honey in glass ...	5 00	3 00	2 00	1 00
9.	Best Beeswax, not less than 10 lbs.	2 00	1 00		
10.	Best Exhibit, the object being to educate the public as to Bees—their natural history, the bee-keeping industry and its relation to horticulture	5 00	3 00	2 00	1 00
11.	Best foundation for Brood Chamber	1 00	50		
12.	Best foundation for Comb Honey	1 00	50		
13.	Best Hive for Comb Honey	1 00	50		
14.	Best Hive for Extracted Honey	1 00	50		
15.	For the most tasty and neatly arranged exhibit of Honey in the Apiarian Department, all the Honey to be the product of the exhibitor	**Diploma.**			

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