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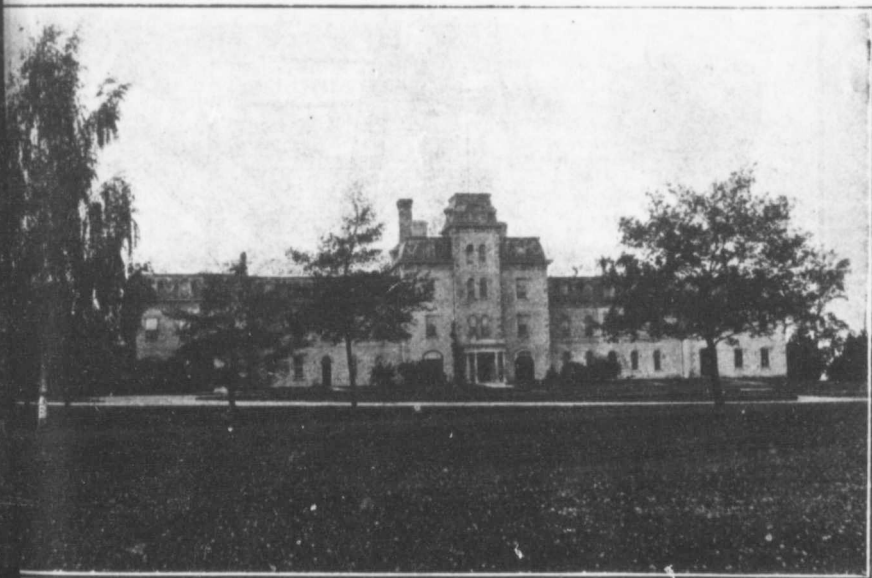
The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

Vol. 17, No. 7.

July 1909

\$1.00 Per Annum

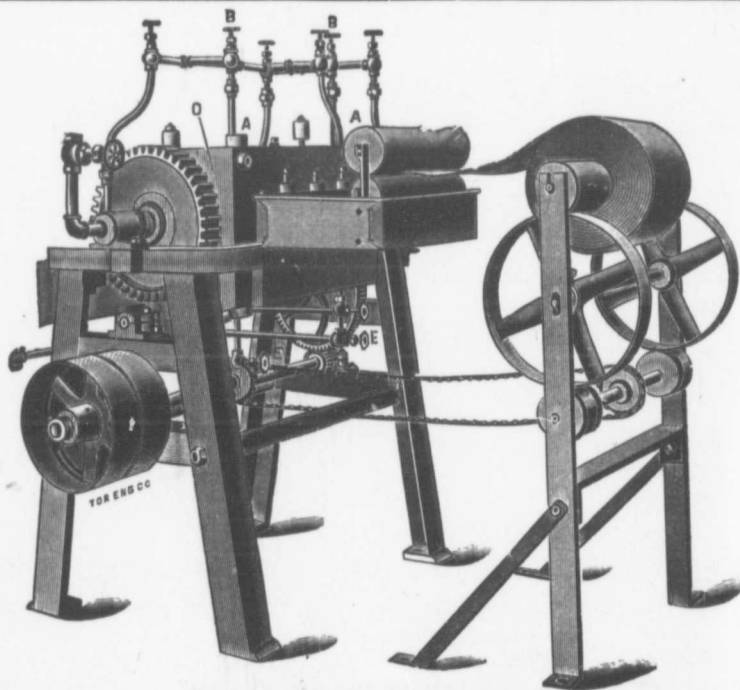


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The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

JAS. J. HURLEY, Editor

Published monthly by
The HURLEY PRINTING CO.,
Brantford, Ont.

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Vol. 17, No. 7

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July, 1909

The Canadian Bee Journal

PUBLISHED MONTHLY

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

Vol. 17, No. 7.

JULY, 1909

Whole No. 533

Wearing a queen out in one season is a new experience to us, but it has happened. And, so far as we can see, she was a good queen, too. We gave her the run of both supers until the honey flow. The excluder was then put on, and she was confined below. But as fast as she filled the combs we lifted one and two up, and kept her going full speed. Finally, we found a somewhat sudden stop, and queen-cells started. That hive was watched. A later examination revealed the fact that a new queen had hatched. But we could not find her. The old clipped queen was still there with a very small bunch of brood. Now, keeping in mind that the young queen had hatched, but could not be found, how were we to size up the situation? Had the bees swarmed out already, and the old queen crawled back because of being unable to fly? Or had the young queen gone out on her honeymoon trip and a small swarm gone with her? Or were the bees intending to supersede the old queen? What was the situation? How should we act? This is what we did: We took a frame of brood from above with a queen-cell on it, and placed it below. This was for safety in the event of the young queen being lost or gone with a swarm. We closed the hive and let it go for six days. On opening the hive again we found an entire absence of eggs and only capped brood. This told us the old queen was gone. We had now to make a diligent search for the new queen, as we supposed she must be there. Fortune favored us at last. We found her. The whole complicated situation, therefore, was solved. The bees were superseding, and, be it remembered, they were superseding a new

queen placed in the hive last midsummer. This bears out Mr. McEvoy's claim that queens can be exhausted in one year if worked to the fullest extent. However, this experience did not take place in the other hives, equally as strong, that were given a new queen at the same time last year. The above statement of exhausting the queen must therefore be modified, and the conclusion arrived at that the superseded queen was not up to standard strength for the work she was called upon to do. We have written the above simply to show how difficult it is to lay down any hard-and-fast rule with regard to the presence of queen-cells and the evidence of swarming. It was difficult to decide in the first instance whether these bees were about to cast a legitimate swarm or supersede. In fact, the point is not yet clear, in that perhaps the bees did swarm, and, finding the queen unable to go with them, they decided to dispose of her. This is an example of what caution and skill is required to manipulate bees, and how easy it is oftentimes to make a mistake.

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And now is the time when our winter of discontent is turned into glorious summer. We were all fearful lest the late, cold spring would interfere with our honey crop. But it is the unexpected that has happened. The consequent lateness of clover gave the bees a chance to build up, and right smartly have they done so. The latter part of June and fore part of July to present writing has been ideal weather, but a bit too dry. Bees about here are working magnificently. Clover is abundant, and there is every prospect of a bumper crop. We are benefited also

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in another way by reason of the late spring. The seeding of early crops was much retarded, and as a consequence more buckwheat will be sown. This will increase the fall flow considerably.



It would appear that European foul brood is getting a start in Ontario. In some respects it appears to be worse than American foul brood in that its destructive work is much more rapid and its opportunities for infection are much greater. The bees can remove the dead larvæ and scatter it over the yard. In the neighborhood of Trenton its destructive work is shocking, and Mr. Schranke, inspector for Bruce and Huron, reports that he has found it in his territory. It is now in the west and the east, and every effort should be made to check its advance.



Our readers have not been writing us very liberally of late. Let us hope it is because they are too busy with their honey crop. This, however, will soon be over, and we hope to hear from a large number as to their experiences during the season.



The marriage is announced of Mr. Geo. Wood, postmaster and bee-keeper, Wesley, Ont., to Miss Mary Coutts, of Eger-ton. The C.B.J. extends hearty congratulations.



The Bachmann Collapsible Honey Super ought to prove a very useful article to comb honey producers. For the ingenious illustration of its method of manipulation we are indebted to the "American Bee Journal."



As we go to press the basswood flow is on, and the indications are that it will be fairly good. The recent rains have made this possible. The weather otherwise, however, has not been as favorable as desirable; it has been a little too cool.

A questioner in the June "American Bee Journal" asks Dr. Miller if there would be danger of introducing foul brood from using the supers from diseased hives. To which the Doctor replied: "That would probably make no difference. And yet foul brood is such a dangerous thing to have anything to do with that I would hardly want to have in my apiary a bee journal containing an article on foul brood." If our friend D. M. Macdonald should hurl the above at our thick head, we would certainly be down and out; the more especially in view of the fact that friend Byer said in his "Notes" recently that a recent issue of the C.B.J. contained so much foul brood that he could almost smell it!! The good old Doctor has lost none of his humor during his forty years among the bees. We wonder if he would let us pass through his apiary without first disinfecting us? We hope some day to have the opportunity of putting him to the test, however.



Mr. Morley Pettit, Provincial Apiarist, gave a brief call at a recent meeting of the Brant Bee-keepers' Association. He had with him a sample of European foul brood. It was nicely cased up in a small well-matched frame, with glass on both sides. It could be carried about anywhere, or exhibited anywhere, without danger. The idea is a splendid one, and will do much to educate the bee-keepers with whom he comes in contact as to the nature of the disease, and how to recognize it. Doubtless, he has a similar one of American foul brood. If not, he should procure it at once.



Inquiries will soon be sent out by wholesale dealers asking bee-keepers how much honey they will have for sale. Be cautious in replying to such inquiries. Wait till the Honey Crop Committee makes its report, and gives you an idea of its selling value. Also, when replying, name your price if you wish, but do not say how much you have for sale, but

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rather ask them how much they can take at the price named. The business bid must then come from them. Their object in asking the question, "How much honey have you for sale?" is to size up the crop, in order that they may be better enabled to set the price which they will offer. Be careful, therefore, not to give this information too readily. Remember, it is the prerogative of the seller to fix his price, and that of the buyer to accept or reject it. We must not allow ourselves to be stampeded and sell at any old price, because the wholesaler threatens us with a glutted market. Late reports indicate that there will not be the quantity of honey that we first expected from the abundant clover crop. The dry weather has cut it off short. Some places report a good yield, others very poor. In our section of Brant County and some of the neighboring counties the crop is likely to be above the average.



A merchant in Yorkshire, England, dealing largely in honey wishes to get into touch with sources of supply in Canada. Write the Department of Trade and Commerce, Ottawa, and refer to No. 1043, Weekly Report No. 287.

Notes and Comments

[By J. L. Byer]

Too busy these days to do any "commenting" on anything; in fact, I have about all I can do to attend to my own business, so will simply give a few "Notes" re the honey season in our "locality." We didn't have a long spell between fruit bloom and clover, as predicted by you, Mr. Editor, as the hot, dry weather that set in during the latter part of May brought the clover on with a rush, and although we had one of the latest springs on record, yet the clover came in with a rush on June 18th, which is earlier than usual for our section. For six days—June 18th till June 24th—we had a wonderful flow; in fact, the heaviest for the early part of the season

that we ever had from clover. The bees in the six days averaged nearly sixty pounds to the colony, these figures, of course, being an estimate, as the honey is on the hives yet, but I am positive that I am well within the mark. Naturally, we began to think of a wonderful yield being in sight, when at the end of the six days the flow about stopped, from the fact of the very severe drouth that we are experiencing. Not even for a whole week, till on the evening of the 2nd of July we had a light shower that laid the dust and seemed to add a little moisture to the air, so for two days since some honey has come in again. However, the clover is about dried up at this date—July 5th—and it can only last for a few days at the most. A medium crop of very choice honey is assured, and, should the basswood do anything, we might yet get a full crop, but, as this source of nectar has only yielded once in the past eight years, naturally we do not bank much on it. One of the lessons gleaned from the peculiar season is the advantage of having the bees very strong when an early flow unexpectedly comes along. Twenty four-frame nuclei that were wintered over have barely stored ten pounds each, and they are now about ready for the flow when it is just over.

Another lesson learned is to have the bees in the supers if possible when the flow comes along, and thus avoid swarming. All told, we have only had twelve swarms to date, and at least two of these were caused by supersedure. We know of some yards where the bees swarmed like fury right in the heavy flow at the start of the season, and naturally that would curtail the surplus. If we are able to hold the bees together now, they should be in great shape for the buckwheat, which will be sown around us, but unless we get rain soon, prospects will be nil in that line. Certainly there are bushels of bees that could make good use of any flow that might come along.

To-day we extracted 2,000 pounds of honey at the Altona yard, and for the first time tried the capping melter. We have voted the arrangement a success, and it certainly is a source of satisfaction to have the cappings all out of the road when operations for the day are over, and unless something should change our minds, we shall treat all our cappings this way in the future. The melting tank was made by a local tinsmith, and the heat was furnished by a small gasoline stove that cost less than \$5.00. Some have thought that the machine would make the honey-house very warm, but we could not notice it whatever; in fact, would not have known the fire was there if had simply to judge by the state of the temperature. From our limited experience we are convinced that these melters will be used almost universally in the near future, as the advantages are many, and so far we have not located many disadvantages.

As to the matter of willows, as stated in the "Journal," I do not know the botanical names of the many different varieties, which are all good honey-producers, and we designate them as the green, yellow and golden willows. These names are given because of the color of the leaves in the early spring, when the trees are in blossom. They bloom in the order that I have named them, but there is only a difference of about a week between the green and golden varieties, the latter being the latest. The yellow kind is by far the best honey-yielder, and it is very common here in York County around mill-dams, where it has been planted to help hold the embankments from being washed away. The tree is extremely easy to propagate, all that is necessary being to break off nice straight branches an inch or so in diameter, and stick them down in the ground about a foot in the early spring. Trees started that way here at a bridge within a few rods of my home only a few years ago are now great trees two feet or more

in diameter. Of course, they do best in a damp location, especially near running water, but the large yellow willow will grow all right in drier locations.

THE BASSWOOD TREE

For the benefit of our readers, one of whom makes an inquiry in this issue, we give the following information regarding the Linden, or Basswood Tree: It is a genus of trees (*Tilia*) of the order Tiliaceæ, ordinarily known as basswoods in this country. The species, of which there are about a dozen, are natives of the northern temperate zone, and more or less resemble each other in general appearance. They are characterized by alternate, usually heart-shaped, leaves, with toothed edges; small yellowish, often fragrant, flowers in cymes; the peduncles of which are attached to membranous bracts; and globular, nut-like fruits about the size of peas. The trees in many horticultural varieties are widely planted in Europe, where they are known to the English as limes, and have been introduced into America for their pleasing form and dense shade, and to some extent also because of their abundant yield of nectar, from which bees make one of the finest qualities of honey. They are also planted for their timber, usually called "whitewood," which is highly valued on account of its whiteness, lightness, toughness and durability, and is used for turned and curved ornaments, and for making honey-boxes and other light articles, the whiteness of which is desired to enhance the appearance of the goods they contain; also extensively used for carriage bodies, cabinet work, and interior parts of furniture. It makes a high grade of charcoal, used by druggists, gunpowder-makers and artists. The fibrous inner bark is made into mats and cordage, and strips of it are widely used for tying plants, etc. When stock food is scarce in early spring the twigs and budding shoots are often fed to farm

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DROPS OF NECTAR Cleaned from Many Yards

SOME QUESTIONS ANSWERED

Please permit a poor pilgrim to plead for light in the following lines:

1. Have built a house some eighty rods from the old one, and want to move our bees. What time of year is best?
2. A correspondent in the June C.B.J. recommends planting a certain willow as a honey plant. What is its name, and where can it be obtained?
3. Experts say in C.B.J., shake lazy colonies. How is it done? Please be explicit.
4. A lady apiarist wishes J. J. to describe a good moth or miller trap.
5. We housed two light swarms in the same hive. Each swarm clustered in an end by itself and went at work. What will probably be the result?
6. Is there an American basswood (*Tilia Americana*) that blooms a couple of weeks earlier than ours (*Tilia Canadensis*)? If so, what are its habits, where can it be procured, and would it pay for cultivation as a honey plant?
7. The writer has great difficulty in finding the queen bee. How can he best overcome this trouble?

AMI 2 R.

1. Better leave them where they are now until you prepare for winter. If you winter outside you may put your cases on the new location. If you winter in the cellar, put them in their new place when you bring them out next spring.
2. Willow is a genus of trees and shrubs (*salix*) of the order *Salicaceæ*. The species, of which more than 150 have been described, are natives mostly of the north temperate zone, but a few are indigenous in the tropics and in the south temperate zone, and some are found close to the limit of perpetual snow in the Arctic zone and upon lofty mountains, where they are reduced very greatly in stature. In general, the species are best adapted to wet ground, and for improving the sanitary conditions around cesspools. Like the Austrian gum-trees (*Eucalyptus*),

which are similarly used, they transpire immense quantities of water. Among the American species the yellow willow (*S. vitellina*), which is common in the east, is probably the best known. The black willow (*S. nigra*) is also indigenous in the east. It grows about 35 feet tall, and is noted for its rapid distribution along streams, into which its brittle twigs fall as they are broken off by every strong wind, and carried far away by the current before they lodge and take root. Other species exhibit this trait more or less also. The pussy willow (*S. discolor*) is also an eastern species, well known because of its silky, downy catkins, which appear in early spring before the leaves. Possibly this would be the best honey-yielder. It is usually a shrub, but sometimes becomes a short boled tree, fifteen or twenty feet high. Its twigs are often gathered in late winter, placed in water in a warm room or greenhouse, and the catkins thus forced into bloom. Other well-known American species are *S. lucida*, which grows about twelve feet tall, and the heart-leaved willow (*S. cordata*), which grows about twice as large. Some species are popularly called "sallow" in Great Britain. Of these the best known are the long-leaved willow (*S. grandiflora*), gray willow (*S. cinerea*), round-eared willow (*S. aurita*), and round-leaved willow (*S. caprea*). The weeping, or Napoleon's willow (*S. babylonica*), is a native of the Caucasus, whence it has been taken to most civilized countries throughout the world, in many of which it has become a favorite tree in cemeteries. It has a large number of varieties. The Egyptian willow (*S. ægyptica*) is noted for the perfumed water distilled from its flowers in India. Consult Bailey, "Cyclopædia of American Horticulture," New York; see also Mr. Byer's note in this issue.

3. First lay a board in front of your hive leading up to a level with the entrance. This is for a runway for the bees to travel upon. Open your hive and pick up the frames and shake them on the runway you have prepared. Shake them all off and let them all crawl back again. Some more experienced men do not go to the trouble of preparing the runway, but we think it is best. There is less danger of losing the queen. This shaking-up causes the bees to go through practically the same experience as in swarming, and it is thought that the psychological effect is about the same.

4. We do not know, unless it may be the good lady herself. It will depend

largely upon her age. When we were younger we were instructed to regard the fair sex as the candle, and us poor boys the moths. We were nearly trapped two or three times, but made good our escape; but the law of average prevails here as elsewhere, and we were finally trapped. Our wings have nearly disappeared. This is the only trapping of moths we know of. Moths proper will not trouble bees on their summer stands if the bees are strong enough to cover the frames. Moths are to be guarded against in the fall when you put your empty combs away. Pile your supers up four or five high. Place a saucer full of carbon bisulphide on top and cover up well. The acid will evaporate and go down, as it is heavier than air, and kill everything in sight. Shortly after this the cold weather will be upon you, and they will trouble you no more. We see no necessity to do any trapping—kill 'em. If you desire to keep them out of the house use screen doors and windows. Without screen doors and windows you cannot keep them out of the house, as they will go in at night to the light.

5. They will soon become united. One of the queens will disappear.

6. Perhaps some of our readers who are better posted on the subject will answer this question. It will pay to plant the basswood tree ordinarily grown in this country, which, so far as we know, is *Tilia Americana*. The *Tilia ulmifolia* is very late in blossoming, and should be more extensively cultivated, in order to extend the season of honey production. We know nothing of "*Tilia Canadensis*." We think you must have made an error here. We cannot find it listed. (See page 248).

7. Patience and practice. There are no short cuts that we know of.

IS IT EUROPEAN FOUL BROOD?

Having been employed at inspecting bees during the past four weeks throughout the counties of Bruce and Huron, I have encountered a number of very suspicious cases of brood. It is somewhat like the American foul brood at first glance, but upon closer examination I find that it does not string as does the other, and differs in other ways. The larvæ has the appearance of being turned end for end, and when removed leaves a milky substance in the bottom of the

cell, which in a more advanced stage becomes dry and black, reminding one of nothing more homely than a dried baking currant. The bees also sip it when disturbed in its earlier stages.

It appears to be very virulent in Bruce County. Many apiaries of 75 to 100 colonies have become extinct or almost so during these last few years. American foul brood is not so prevalent as to account for this great loss, and the writer is strongly of the opinion that these cases found are cases of European foul brood.

I should like to hear from other inspectors as to whether or not they found any such cases, and what their opinions are.

JOHN S. SCHRANK.

Port Elgin, Ont.

[There is no doubt that this is European foul brood. We thank you very much for so promptly writing us. Too much publicity cannot be given to this disease. It is apparently more to be dreaded than ordinary foul brood. It is now in the west and east, and, unless great care and diligence is shown, it will spread all over the Province.—Ed.]

SWARMING ECCENTRICITIES

Some time ago I read in your Journal that, while bees have certain rules they go by, yet they sometimes depart from these rules. For instance, one queen to the hive is the rule, yet it sometimes happens that two queens seem to live in the same hive in peace and harmony. Other departures from the usual course may be cited. Perhaps it is because they are all females that you cannot always tell what their line of conduct may be. Of course, I do not forget that there are drones in a hive, but, like other male animals, they do not count in the management of the house.

I think I have had a rather unusual case this week. A swarm which I will call swarm A came off, and I hived them. Just as I had secured them another swarm came off, which I will call swarm B. Just as soon as I had hived swarm

B swarm A very spot from previous swarms. I had to catch them out and shake down the

Soon my wife came off again, and a handful of them came post-haste to the remainder. The remainder shortly after a comes what I of the program bees from sw queen, which ought to have hive. A few great part went as I said, I This, I think, cannot always And I suppose females.

Kaslo, B.C.

[Are you not "females?" Yes, new in swarming, various kinds of that goes out swarm (usually with a virgin queen) perseding. If they usually go a swarm return more than one at this time, a with one of them other problem t puzzling. If you a swarm issues or perhaps not came out of, the lose your clipped swarm will go b as soon as they Under these circ this swarm if y take care of it. can now swarm, with one of the hive is left safe way, either hatch as there is some ference between mixing up of swar

B swarm A came off again and lit on the very spot from which I had a few minutes previously taken swarm B; in fact, I had to carry swarm B to the stand to get them out of the way, so that I might shake down swarm A.

Soon my wife called that swarm A was off again, and, sure enough, about a handful of them came off and went off post-haste to the woods, and I lost them. The remainder of swarm A came off shortly after and filled the air. But now comes what I think is the unusual part of the program. According to rule, these bees from swarm A, having lost their queen, which had gone to the woods, ought to have returned to their parent hive. A few of them did so, but the great part went in with swarm B, which, as I said, I had placed on the stand. This, I think, is proof again that you cannot always tell how bees will act. And I suppose that is because they are females.

Kaslo, B.C.

H. BEER.

[Are you not just a little hard on the "females?" Your experience is nothing new in swarming-time. There are various kinds of swarms—a prime swarm, that goes out with the old queen; a swarm (usually small) that goes out with a virgin queen when they are superseding. If there is only one virgin they usually go back. This accounts for a swarm returning. Should there be more than one virgin queen on the wing at this time, a bunch of bees may leave with one of them. There is, however, another problem that often arises that is puzzling. If your queens are clipped, and a swarm issues without your knowing it, or perhaps not knowing which hive they came out of, the probabilities are you will lose your clipped queen. In this case the swarm will go back and will issue again as soon as they have reared new queens. Under these circumstances, you will lose this swarm if you are not at hand to take care of it. The bees know that they can now swarm, and seek a new home with one of the young queens, as the hive is left safe for a young queen, anyway, either hatched or about to hatch, as there is sometimes a day or two difference between the ages of cells. The mixing up of swarms is a very embarrass-

ing thing when it happens. But there seems to be no way of preventing it sometimes. There are many unusual things happening in a bee-yard that test the skill and judgment of the operator.—Ed.]

ADVANTAGE OF YOUNG BEES FOR WINTERING—SECTIONS

It is some time since you have heard from me, but that was because I have been too busy to find something to write about. Last fall I wrote you telling how I tried to have young bees only wintered, and those hives so treated have produced one or more supers of sections than those not touched. They were always boiling over with bees, so this fall I am going to give every hive the same chance.

Another thing I have found out is the advantages of the sectional and eight-frame deep body. So far the eight-frame 9½" body is ahead, both with ease of handling and results. In another paper I could describe the system by which I make use of the defects of the deep hive and prevent swarming, and was sure the other hive beat any other for comb honey, and my prejudice died hard.

I used two widths of sections this year, the 1⅝" and 1 15-16", and under same conditions the narrow sections were far better filled than the wider; but they are much objected to on account of the light weight, and they cost a bee-keeper just as much as a heavier one. Alsike lasted nearly four weeks, but white didn't count for much; basswood about five days. Bees are now on sweet clover. I must report a fair crop, but not equal to 1908, either in quantity or quality.

WM. A. LISHMAN.

Cayuga, Ont.

[Glad to hear from you again, and we hope you will let us have the paper describing your system of work and prevention of swarming. Yes, abundance of young, well-fed bees are what is requisite to successful wintering. The bee-keeper who keeps this point in view, and also keeps his queens young and full of vigor, will be successful in reaping the harvest.—Ed.]

FORTY THOUSAND ITALIAN QUEENS ARE NEEDED

This is not a thousand queens to each county in our Province, but it would make a fair beginning to start with, and, if followed up at this rate for five years, it would bring the apiaries of our country up to where they should be. I never found any race or breed of bees equal to the Italians for feeding their brood or gathering honey. I breed from the colonies that gather the most honey, and re-queen all every year. I also buy many queens, and expect to do so as long as I keep bees. Italian queens really cost nothing, because the extra yield of honey they give in one year after more than pays for them, and then it leaves the owners with improved stock of the best kind.

Any colony that has been queenless for some time should have every comb removed and its brood chamber filled up with combs full of brood, which can be easily done by taking a comb full of brood from the strongest colonies here and there through the apiary. It can be three weeks after a queenless colony is given a laying queen before her young bees begin to appear, and for this reason all queenless colonies should be boomed with brood before introducing a queen, so as to give the queen a fair chance, and send the colonies into the fall full of bees. This is about the best time in all the year to re-queen, and I am rushing it as fast as I can. The queen-breeders of Canada and the United States have done more to help the bee industry and put it on a footing than any other class of men that we have in our ranks.

It is a long time since Mr. Langstroth, the father of all modern bee-keepers, introduced Italian queens into the United States, and it is about forty-five years since Mr. Gemmill, the best all-round bee-keeper I ever found, introduced Italians into Canada.

WM. McEVOY.

Woodburn, Ont.

WHAT IS THE TROUBLE?

This spring I put out ninety-five colonies of bees in good condition; now I have only fifty. Have had no swarms. In the colonies the brood cells seemed to be very scarce, not more than fifty, and plenty of honey. Some of the young bees came to maturity, others just cut the cappings. Could any of your correspondents give me any information as to what happened the queens. I do not think it is foul brood. Could you give a more definite description of what foul brood is?

What reports are you getting from other localities of the prospects of the honey crop this season?

ARCHIE McINTYRE.

East Templeton.

[It is very difficult to say what has happened to your bees. Dysentery and spring dwindling might possibly have brought it about, but we do not think so. Queens will not lay unless there are bees to take care of the brood. If your hives ran down very weak during the bad weather in the spring, it would not be the queens' fault. But if other conditions were right they should have recovered long before this. There is a strong probability that it is foul brood. When you saw something wrong, and were not equal to the occasion, you should have sent for the inspector at once. He would have been a great help to you, even though you did not have foul brood. He would have pointed out the trouble and helped you very much. It is a great pity you have allowed the honey flow to pass before calling for help. Remember, the Government is only too anxious to help persons in your condition. It costs you nothing but the price of a post-card to write Mr. Hodgetts, Parliament Buildings, Toronto, and may save you hundreds of dollars.

No, we cannot give a more definite description of foul brood than has already been given during the last few months. We have devoted a great deal of space to this matter, and if it has not been sufficient to guide the inexperienced bee-keeper, he should at once seek aid from the inspector. It is a great pity that your loss should be so great, and a still greater pity that you did not seek the inspector's aid earlier in the season. If

July, 1909

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you should have foul brood, the best time of the year for treating it has passed. Write the Agricultural Department at once if you do not happen to know who the inspector is.

Crop reports vary greatly. Some places it is good; others fairly good; others poor.—Ed.]

Chalmers' Observations

Correction.—On June 18th a communication was received from Mr. John C. Beattie, of Sebringville, requesting me to go and inspect his and others' bees. It was arranged that Mr. Beattie's request be attended to on the 30th ult. I accordingly set out that morning for the field of action, and the correction I wish to make is that this is not the Beattie to whom I had reference in my May "Observations," C.B.J., page 175.

At the time the article was written I was not aware that there was another Beattie in the Stratford district who kept bees other than he one of whom I wrote. Had Mr. Alpaugh given the full name in his April article I would have known at once that I knew nothing of Mr. John C. Beattie, and although it was Mr. Alpaugh's fault in not giving the full name, yet, in justice to both him and Mr. Beattie, I hasten to make this correction. From the description given of the Beattie bee-yard, both Mr. Alpaugh and Mr. J. C. Beattie should have known that it did not correspond to the latter's apiary, nor yet to himself.

This Mr. Beattie has as suitable a plot as is possible to find for an apiary (not despising the other), and at the time of my visit there had everything neat, and, moreover, he is a young man of rather an attractive manner, on whom I look as one of our coming bee-keepers. He is very much afraid of this dread disease and has a keen eye on any suspicious cells of brood. I hope he, Mr. Alpaugh and the readers of the C.B.J. will accept this explanation.

Inspection.—As considerable has been written both for and against early and

late inspection, might I crave your indulgence while I give my convictions in the matter? I feel a little puzzled to know just where the limit is of the two extremes.

Mr. J. L. Byer certainly goes to the spring extreme when he asks, in May C.B.J., page 166, "How many bee-keepers would like to have their bees unpacked, and the brood-nests broken up, when the thermometer was at the freezing point in the month of April?" I feel certain that the Department does not wish any of its inspectors to act in an untimely season, and it would certainly be very inappropriate for any of them to break up a colony of bees clustered as they are in cold weather. Not even then, but after the cluster is induced to break up as warmer weather approaches, there is danger in examining bees too early in the season for the safety of the queens. Inspectors have no right to treat other people's bees differently from the way they would their own, and I think we all know the danger of the least excitement in spring often causing the bees to ball their queen, and if she comes out alive it is in a more or less maimed condition. In my mind, it is not wisdom to go out inspecting before dandelion bloom, unless we go out, as Mr. Alpaugh did this spring, to see that dead colonies are put out of the way, but that cannot well come under the word "inspection," as it is understood, and even here there might be difficulties, for the inspector might strike places (as the writer has done on more than one occasion) where there is no one at home. What then?

Through inspecting in Perth last summer and fall I knew a number who had foul brood in their apiaries, and when allotted Waterloo this year, instead of Huron, I applied for and obtained the names of a number of bee-keepers in Waterloo County from Mr. P. W. Hodgetts, and, learning that some of them had had foul brood in their yards in the fall, I wrote to all such in both counties

in early April requesting them that if they had any colonies of bees die during winter to see that they be securely closed up or carried to the cellar, and I am pleased to state that in every case my request was complied with.

[This was very thoughtful and a capital idea.—Ed.]

In my mind, it is wiser to inspect late in the season than too early, but the inspectors must use a little judgment when there is danger from robbing. When late inspecting is done, and diseased colonies not treated and allowed to be wintered, the owners should be reminded in spring, either by personal call or by mail, that if any of their bees (diseased or not) have died during the winter, that the combs from such be out of sight. If the diseased ones have wintered it would be wise to see that they be taken to some distance, if possible, from healthy ones, as I don't believe in the contraction of the entrance being of much account in preventing robbing; it retards the robbers a little, but it will never stop them, and if a diseased colony is weak, robbers are likely to locate it, whether the entrance is contracted or not. I can cite a case which occurred this spring, where a man's healthy bees robbed a colony which he knew last fall was diseased, and the disease developed in two others. The entrance was contracted, but of no avail; but if they were in quarantine it would be little or no difference whether they were robbed by the other diseased colonies or not. I would not, however, advise inspecting after bees have clustered for winter, but would consider it wise enough as late as the end of September.

Foul brood may be in a colony over winter and not show up till the season advances a little, and in such cases early inspection is of little use. Mr. J. B. Lichty, of Wellesley, lives six miles from my home. For some thirteen years I have helped Mr. Lichty more or less with his bees every summer, and never

saw a cell of foul brood in his apiary till the 19th ult. He sent for me to go and inspect bees about one mile (bee-line) from his place. I went as requested, Mr. Lichty accompanying me, and found all bad with foul brood. The owner had died this spring, and no one knew aught about the bees. We then went back to Mr. Lichty's apiary and found three out of four diseased. We naturally supposed that his bees had been robbing at this diseased apiary in spring, but circumstances cause me to believe that the germs were carried to Mr. Lichty's apiary last fall, as I got two colonies from him last fall, and since discovering it in his yard I find foul brood has developed in one of the two which I got from him. Now here is a problem: I allowed Mr. Lichty last fall to give his bees the liberty of licking off the combs from which the honey had been extracted by setting the hives containing them in the yard. Is it possible that the bees from the diseased apiary visited those combs, and that the germs of the disease were transmitted in that way, or had Mr. Lichty's bees carried it from the diseased apiary in question, or some other, direct?

By the way, I have been told, and have stated myself, that foul brood will not be found in drone larvae. It is a mistake. I have found for the first time on the 6th inst. that it will, and have since proved this correct.

New Contributor.—I was greatly pleased, Mr. Editor, to see a new contributor make his bow in June C.B.J. in the person of Mr. J. W. Honderich, of Baden. I don't know by what you say by way of foot-note that you understand that Mr. Honderich is perfectly deaf. I am dull of hearing myself, and I know you are worse, but Mr. Honderich cannot hear a sound, his hearing having left him suddenly a few years ago, and yet he retains his speech. Mr. Honderich is an apt scholar, and would put many a one to shame, both by the way his apiary is kept and by the interior man-

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agement of the bee hives and other ways. He lives a very exemplary life. We will be pleased to see articles from his pen at any time, and I trust that we older bee-keepers will assist Mr. Honderich to solve any very difficult problems which he may propound to us.

DAVID CHALMERS.

Poole, Ont.

INTERESTING GERMAN ITEMS

[Translated by Jacob Haberer]

Had we not extra good reports from bee-keepers this spring? But how is it now? I hope most of them can give better reports at the present than I can. In the first place, we had very bad spring dwindling; colonies that came fairly strong out of winter had by fruit bloom a few handfuls of young bees, and the old ones gone. What was the reason? The long, open fall, the mild and changeable winter, kept the bees restless and shortened their vitality; spring, too cold, brought the young bees too late. There was no shortage of stores, but had to take away many combs to give room for brood, so feeding was not practised, but uncapping combs was a necessity for the young bees. Queens mostly young, and some two-year-olds marked for requeening, showed up different during clover flow—fine, solid sheets of brood—so it was no use to blame the queens. Anyhow, I was unable to bring the whole yard up to the proper point for the clover, of which we had a good crop, but we had no rain for over a month of any account, so everything dried up and clover is entirely gone, with very little honey even from the strongest colonies. I don't think there is much more than a ton of surplus on the 140 hives in my yard. Swarming almost none; only four, and two of them had even no cells yet. We are in good shape for basswood now, and hope it will compensate for the clover. The trees look well, and will open in a few days. Contrary to other reports, my cellar-wintered bees did far

better than the outside ones; most of them were ready by clover time, and only reduced the 50 of them to 48. As to sugar-fed hives, they dwindled as bad as the others. The combs of honey (mostly buckwheat) were nice in the spring, but, strange to say, some colonies gathered more from other fall flowers, and there was dysentery visible. But all others were as clean as possible, but the old bees went off too soon for this year.

I would like to hear whether we had only in this locality such a bad flow. There was in average quite a loss of colonies in this part again, but, sure enough, bee-keeping is badly neglected in this part. I may say of those three winter-breeding colonies I observed and mentioned in C.B.J., one of them is good, one had less brood in May than in March (no good), and the third only medium. They seemed all strong in early spring. I believe winter breeding is irregular and no good. After a good rest we may expect a good, fresh new life.

Simple Method to Raise a Lot of Fine Queen Cells

Insert a nice but somewhat dark comb in the centre of your choice colony. In four days, when the eggs commence to hatch, take the comb and lay it on the flat side. Take a ruler and cut the one side in strips, leaving one row of cells unharmed. Cut only to the centre of the foundation of the comb. Between the sound rows of cells scrape off the cells with a sharp chisel; in rows of cells destroy every other cell. [Would it not be better to destroy two or three cells? —J. H.] Now you have a sheet with a lot of rows of one-day-old larvæ from your choice colony. On your colony that has been made queenless, and all open brood removed, you put a rim; lay your prepared comb on it flat, with sufficient room under for the queen cells. Close every space on top. Of course, the young larvæ on top will be lost, but in two days the lower side will be covered with a

mass of queen-cells, which can be nicely cut out when ripe. Of course, you have to feed your colony well from below. This method has been already carried out with good results by J. Humvall, of the Austrian Bee-keepers' School.—Wiener Bienenvater, G. W. fur Bienenzucht.

JACOB HABERER.

Zurich, Ont.

HONEY VERSUS CANE SUGAR

[By Mrs. B. R. Winslow, in "Gleanings in Bee Culture."]

A child's craving for sweets of some kind shows a real need of the system in that direction; but, unfortunately, the sweets at hand and usually given to supply this need are not wholesome, and serve no better purpose than to please the child's taste. In fact, the work of changing the cane sugar into grape sugar, so that it may be assimilated, is often too great a task upon the child's stomach, and sickness results. This, however, is not the case with honey. The bees have fully prepared it for immediate assimilation, and it is ready to be taken into the system without taxing stomach or kidneys. Doctors frequently order honey for those whose digestive organs are too weak to convert cane sugar into grape sugar properly. The wholesomeness of honey, however, is not disputed by those who know anything about the product of the hive. The principal difficulty in the way of its substitution for the sweets usually craved by children is the apparent limitation of its use. The child has an inordinate longing for cakes and candy, and that is not always satisfied by bread and honey; therefore, to take the place of cane sugar, honey must be prepared in the same manner as cane sugar. It must be made into cakes and candies and other dainties dear to the children. The object of this article is to supply housekeepers who desire to substitute honey for cane sugar, in the diet of

their children, with a few simple recipes, obtained from practical experience, for making this wholesome sweet into a variety of pleasing confections.

A few suggestions on the care of honey may be of benefit to those who are so situated that it is cheaper to buy in quantities. The worst place to store honey, or even to keep it for a short time, is in the cellar or any damp cool place. Honey, when extracted from the comb, readily absorbs moisture, becoming thin and (in time) sour. The very best place to store honey is in the attic, up next to the roof, where it is hot. During cold weather honey that is kept any length of time has a tendency to granulate, turning to a white, semi-solid, granular condition. This is called "candied honey," and it frequently "candies" so solid that it must be dug out of the bucket with a knife. It is a simple matter, however, to restore it to its former condition. Place it in hot water, never over 160°, and let it stay until it has liquefied. It may take an hour or it may take a whole day.

In the following recipes quantities are given in pints and pounds because the success of honey recipes depends upon the right proportion of the ingredients. All cups are not the same size, and do not hold the same quantity of material, therefore it is best to use a standard measure.

The simplest honey cake is the honey ginger-snap.

One pint of honey; $\frac{3}{4}$ lb. butter; 2 teaspoonfuls ginger.

Boil together for a few minutes and allow it to get nearly cool. Add enough flour to make a stiff dough, and roll out thin; cut into round cakes and bake quickly.

Another simple cake is the honey cooky. The recipe is given for a large quantity because they will keep indefinitely, and they are nice to have in the house all the time for the children to eat between meals. If they are wanted in smaller

quantities to half, or even

One pint of flour to make a teaspoonful

Mix well

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Bake in a shallow

A richer confection of butter

$\frac{1}{2}$ lb. butter; or clabbered

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quantities the recipe can be reduced a half, or even one-quarter.

One pint honey; 1 quart sour milk; 1 teaspoonful soda.

Mix well together and add sufficient flour to make a soft dough. Roll moderately thin and cut into round cakes. Bake in a slow oven to prevent burning.

A richer cooky is made by the addition of butter and eggs. One pint honey; $\frac{1}{2}$ lb. butter; 4 eggs; $\frac{1}{2}$ pint buttermilk or clabbered cream; 1 quart flour; 1 teaspoonful soda.

Mix the honey and the butter and the eggs well and add the buttermilk. Sift in the flour and soda and mix well. Mix in enough flour in addition to the quart to make a cooky dough that will roll out well without sticking; cut in round cakes and bake in a slow oven.

In the line of confections, some sugar must be used to make the honey "caudy," but the home-made honey caramel has the advantage of being pure.

One pint honey; 1 lb. sugar; scant gill of cream.

Boil until it makes a soft ball when dropped into water. Stir in a teaspoonful of vanilla, and pour it into a shallow buttered pan to the depth of about half an inch. When cool enough to prevent its sticking to the knife, cut into inch squares. If chocolate caramels are desired, use a tablespoonful of melted chocolate instead of the vanilla, stirring it in just before pouring into the buttered pan.

To make honey popcorn balls, boil a pint of honey in an iron frying-pan until it is quite thick, and then stir in the popped corn. When cool, mould into balls.

As a substitute for tea or coffee for children there is nothing better than honey tea—a very simple tea made by adding a tablespoonful of honey to a cup of hot water. If not sweet enough to suit the taste of the child, add more honey.

THE ONTARIO AGRICULTURAL COLLEGE

Its Powerful Influence in Agricultural Education.

ON June 17 we had the pleasure of joining the North and South Brant Farmers' Institutes' excursion to Guelph, for the purpose of visiting the Agricultural College. It was our first visit. To say that we were impressed with the magnitude and beauty of the College and its grounds is putting it mildly. It was the middle of the glorious month of June, when all nature was at its best. The magnificent campus was clothed with flowers, trees and foliage, and presented a most beautiful picture. The buildings are spacious and substantial and well adapted for a residential school.

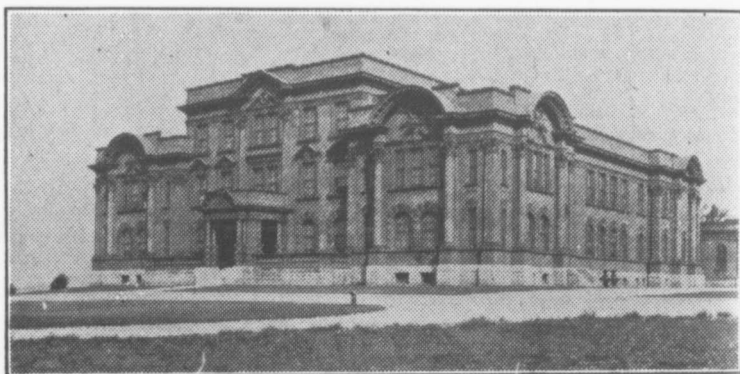
A hungry crowd arrived about noon, and a rush was made for the dining hall, where some four thousand had already been fed. After the luncheon President Creelman addressed the gathering. He pointed out that these popular excursions during the month of June from all the rural parts of Ontario were for the purpose of educating the people as to the practical purposes of the Agricultural College. Its purposes were practical—to educate the farmer to better and more efficient methods of farming. It was not a model farm; it was an experimental farm, conducted in conjunction with a college education that had for its purpose the training and educating of farmers. The knowledge that had already been imparted to the thousands of young men who had passed through the college has had a tremendous effect on the increased production of agricultural products and live stock. He urged those present to do something for the boy on the farm. One hundred dollars spent on the boy for a course through the college would be of lasting benefit to the boy and to the agricultural interests in general. They had to pay the expenses of the college in any event, as the revenue was not sufficient to cover expenses. Their

sons and daughters therefore should for a nominal fee enjoy the advantages of the college.

During the year 1908 the total attendance of pupils from Ontario was 264; from other provinces of the Dominion, 51; from other countries, 89; among these other countries represented was Germany, Holalnd, Ireland, India, Japan, Jamaica, Mexico, South Africa and Spain, and the United States, which latter sent twenty-two students. The college was known throughout the world, and was reputed to be the finest. The people of Ontario should be proud of its high standing. The total cost of the college during the

ence, with a view to their being better housekeepers, wives and mothers. The Hall had been filled to its utmost capacity, and a number of applications for rooms had to be refused. He then extended the freedom of the grounds to all present, naming the chief points of interest, viz., the museum, the experimental plots, dairy department, poultry department, garden and horticultural departments, cattle, etc.

The crowd then wandered off, each going his or her way, according as they were interested and time permitted. We had the opportunity of visiting the dairy building, where butter was being made



MACDONALD INSTITUTE, O.A.C.—Where Girls Learn to Cook, Wash and Sew

year 1908 was \$116,284.77. The revenue was \$28,567.64, leaving a net expenditure to be met by the Government of Ontario of \$87,717.13. This was therefore a people's college, and he urged strongly upon them the necessity of sending the boys from the farm for a course of study, if it were only for a short course.

Referring to the work of the Macdonald Institute, he said it was meeting with favor throughout the length and breadth of the land, and applications for admission were coming from other countries. Here the young lady was taught how to cook, to sew and to wash. Here big hats and fancy dresses were out of style, and young ladies were taught domestic sci-

ence, with a view to their being better housekeepers, wives and mothers. The Hall had been filled to its utmost capacity, and a number of applications for rooms had to be refused. He then extended the freedom of the grounds to all present, naming the chief points of interest, viz., the museum, the experimental plots, dairy department, poultry department, garden and horticultural departments, cattle, etc.

on scientific principles and never touched by the hands. The poultry department was also an attractive feature. This department is presided over by Professor W. R. Graham, one of the best in his line on the continent of America. Professor E. J. Zavitz, the wizard of seed grains, personally conducted large numbers to the various plots, simply and clearly explaining everything. The museum was a centre of attraction. The beautiful wax fruit was the wonder of all, and it was with some difficulty that we persuaded ourselves that it was not the real thing. The vegetable garden was a joy to see.

After wandering about for some time,

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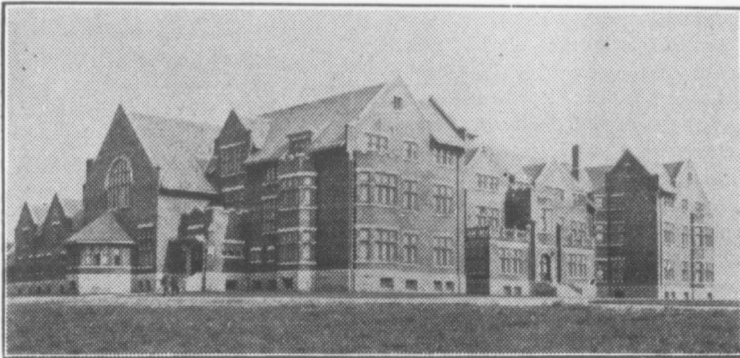
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we had the good fortune to fall in with the able and popular Bursar; S. Springer, whose large proportions and genial, smiling face made us feel at home at once. And we were not disappointed. He took us in tow at once, and gave us some knowledge of the college which it would have been difficult otherwise to have obtained. A new coal-house, built under his supervision, holds 3,000 tons of coal, and is connected with a new boiler and engineers' department by a tunnel, through which all coal is lightly conveyed to the boilers. The mechanics and manual training department was next visited. This is a very important branch.

selves, and there still remaining much overlooked, Mr. Springer invited us into his own residence, where a delightful hour was spent listening to his college "experiences." He is as full of enthusiasm with his work as a boy with a new toy. With President Creelman at its head, and Bursar Springer in charge of the commissariat, the Ontario Agricultural College ought to be an ideal spot for a husky young farmer, full of health and enthusiasm for hard work.

The Macdonald Institute was our last place of call. It is a magnificent pile, in which our young ladies will find every comfort. We think, however, that such



MACDONALD HALL, O.A.C.—Residence for Girls

Here boys are trained in all manner of mechanics, woodworking, carpentering, blacksmithing, and the study of farm machinery. By arrangement with the Ontario Education Department, a summer school for public school teachers is held here from July 2nd to 27th, in which the following courses are offered: Course I.—Cardboard and Art. Course II.—Woodworking. The instruction in Art and constructive work is under Miss Jennie Grier, of Port Arthur, a former student of Macdonald Institute. We had the pleasure of meeting Miss Grier and found an old acquaintance. Mr. Springer informed us her work was most successful. After thoroughly exhausting our-

spacious and costly buildings should have provided for more than 115 young ladies, which, we are told, is all that can be accommodated. Its capacity is now overtaxed, and the Institution is but in its infancy. This is the only shadow on the picture that we saw, save the fact that there was no provision for an apicultural department. But this the Government is providing at Jordan, and which Mr. Pettit is now getting into shape. Of this you will hear later on. As a citizen of Ontario, we are proud of the Ontario Agricultural College; we are proud of the record it has made; we are proud of the many graduates it has sent out, who are now the leading teachers in

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agriculture in every State of the neighboring Republic, and other countries as so; we are proud also of those men in whose minds the idea was conceived, and who brought it to its present state of efficiency. It is a monument to their sagacity and statesmanship. "They builded better than they knew."—Ed.

EDITOR HUTCHINSON'S OPINIONS

Disinfecting Foul Broody Hives

In the last issue of the "Canadian Bee Journal" there is quite a little space used in discussing the question as to whether it is necessary to disinfect foul broody hives when treating diseased colonies. Years ago I used to paint the inside of the hives with kerosene oil, and then set it on fire and burn out the inside of the hives. I did this because I was told that it was necessary. Later I learned that McEvoy, France, Taylor and others were treating the disease successfully without disinfecting the hives, and I discontinued the practice; and, judging from my experience since, and it extends over several years, I see no necessity for disinfecting the hives.

Shall the Bee-space be Above or Below the Frames?

The "Canadian Bee Journal" is discussing the above question. There must be a space between the frames and the bottom-board, between the frames and the sections, between the different tiers of sections and between the sections and the cover. These spaces ought all to be in the bottom of everything, or else in the top. To have it otherwise would cause confusion. As a rule, this space is put in the top of everything, and the only objection to its being in this place is that we can't set a hive or super upon a flat surface without crushing bees. A flat cover, cleated at the ends, furnishes a desirable place upon which to set a hive or super. Turn the hive or super around so that diagonally opposite corners will rest upon the cleats. When

such a cover is not used, then an extra hive or bottom-board must be provided when handling hives or supers filled with bees. When the space is put in the bottom of everything, then an entrance must be cut in the lower edge of the hive, or into the surface of the bottom-board. More serious than this, however, is the fact that the space at the bottom of things precludes the use of a flat cover, which a large class of bee-keepers prefer. Dr. Miller also mentions the objection that any shrinkage of the super throws the sections above its upper edge. My preference is to have the bee-space in the top of everything, and, so far as my observation goes, the great majority is of the same mind.—"Bee-keepers' Review."

POOR IN THE EAST

At the present time, in the Eastern Townships, the outlook for honey is very small. It is doubtful whether the bees will gather enough to winter on. Swarming has only just commenced, fully two weeks later than usual.

C. W. SHEPARD.

Canada Condensed

The prize list of the Canadian National Exhibition is now being distributed, and, as usual, it contains handsome premiums for everything Canadians make, or grow, or mine. The Exhibition this year, which begins August 28th and closes September 13th, thus giving two full weeks open to the public, promises to be on a more magnificent scale than ever before, and the prize list is ample evidence that the President and Directors of Canada's Great Fair are determined to keep it in the van of Canadian progress.

To mention even the features of the different sections in limited space would be an impossibility. Suffice it to say that to the grand total of \$50,000 in premiums, specials are added in every department, and that no effort or expense has been spared to secure special attractions in keeping with the greatest exhibition on the continent. To hit the million mark in the matter of attendance is the avowed intention of the management this year.

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ONTARIO DEPARTMENT OF AGRICULTURE BULLETINS

Condition of Bees and Crop Prospects—European Foul Brood.

Reports received from prominent bee-keepers throughout the Province the present year indicate generally a much better condition of the apiaries than at the same time a year ago. It is almost universally stated that the bees are in good numbers and ready to take advantage of the clover at its opening. Apple bloom was abundant and rendered good aid in feeding the bees for their honey gathering later. Altogether, prospects for a good season are decidedly better than for a number of years.

The apiary inspectors report a greater interest shown in bees, and it is hoped that through the efforts of these men much will be done towards strengthening the industry in the Province. While there is still considerable disease reported from different places, a decided improvement, however, is noted in this respect. The only setback is the discovery of the black brood in another section in the eastern part of the Province. The following are samples of the reports received:

Brant.—Condition of bees only fair at present; those that were packed on summer stands all winter are better. Very poor weather to work. About 16 per cent. loss, due to poor queens and spring dwindling. Fed sugar syrup. White clover came through winter very well.

Carleton.—General condition of bees when removed from winter quarters good; present condition never was better. No stores fed. Very little clover of any kind this spring, owing to poor take of grass. No loss.

Dufferin.—General condition of bees this spring was good; 7 per cent. not doing well; fed honey in winter. Alsike and clover so far are good.

Elgin.—Condition of bees this spring was first-class; in good working condition at present; loss 7 per cent., due to queen-

lessness and starving. Some foul brood; fed honey. Clover looking well.

Essex.—The colonies wintered well, and all report in good strong condition at present; loss 3 per cent., robbed by other colonies and some queenless; some fed honey; white clover and alsike in good condition this spring.

Frontenac.—General condition good. Those in cellar were removed from winter quarters April 5th; those in clamps May 24th; loss 9 per cent., due to dysentery and queenlessness; no loss from dysentery with these wintered outside. Clover came through well and have every prospects for a good honey crop for 1909.

Glengarry.—General condition good in spring and at present time; loss 3 per cent.; a number were queenless; fed honey; the clover crop is only fair.

Haldimand.—Outdoor-wintered bees seem to have fared best, and were mostly in good condition. They are brooding up rapidly, but are behind what they should be, and stores are very scant; loss 9 per cent., partly due to queenlessness and spring dwindling; one starved; fed sugar syrup. White clover and alsike in excellent condition.

Huron.—Bees wintered well; a little weak at present time, owing to spring dwindling and queenlessness; fed honey in comb; clover of all sorts came through the winter well, but, owing to cold and wet, bees are not as forward as usual. Loss 5 per cent., due to dwindling and queenlessness and dysentery.

Kent.—General condition of bees good, considering cold spring; loss 4 per cent., due to robbing and queenlessness; no feeding done; the average condition of clover is only fair.

Lambton.—General condition of colonies this spring was good; very good condition at present, considering backward spring; loss 6 per cent.; fed clover honey, sugar syrup; loss due to queenlessness, spring dwindling, dysentery. White clover and alsike came through in splendid shape.

Lanark.—General condition of bees this spring very good, and doing well at the present time; loss 1 per cent., due to queenlessness; fed honey; white clover and alsike came through fairly well.

Monck.—General condition of bees wintered on summer stands, no loss; fed honey; white clover and alsike came through fairly well.

Middlesex.—Reports general condition of bees in spring to be good; fair at present time, considering backward spring; those wintered outside in splendid condition; loss 8 per cent., due to queenlessness, spring dwindling, shortness of stores, hard spring; some fed sugar, some honey, but mostly sugar syrup; white clover and alsike in good condition.

Muskoka.—General condition good this spring when removed from winter quarters and at present time; loss 6 per cent.; fed honey and some syrup.

Norfolk.—General condition fair this spring; outdoor-wintered came through in good shape; very good at present time; loss 8 per cent., due to cold, backward spring, queenlessness, spring dwindling; others light in bees last fall; fed buckwheat honey, some natural stores, and some report plenty of stores and no feeding done. Not much alsike grown here.

Northumberland.—Fairly strong; loss 4 per cent., caused by starving, queenlessness; condition at present time good; some fed sugar syrup; white clover fairly well; not much alsike grown.

Ontario.—Bees took first flight April 1st, and flew apparently very strong, but spring being so backward that it caused a great deal of dwindling; loss 20 per cent., cause unknown; fed sugar syrup. Clover never looked better.

Oxford.—Condition of bees at present time very good; loss 13 per cent., weak colonies; fed honey. White clover and alsike not very good.

Peel.—General condition of bees this spring first-class; loss 5 per cent., due to queenlessness, some starved, some dwindling; fed sugar syrup and some honey; alsike clover looks well in this section.

Perth.—General condition when removed from winter quarters good; removed from 1st to 13th of May; in fair condition now; loss 17 per cent., queenlessness the cause; fed sugar syrup; alsike good; report general condition good this spring; removed about middle of April; building up well at present time; losses not heavy, due to queenlessness and some dwindled out; fed sugar syrup; clover in fine shape.

Prescott.—General condition good; loss 5 per cent., caused by queenlessness; fed sugar syrup; clover good in this locality.

Prince Edward.—Bees wintered very well, but owing to the cold, windy April did not build up; are not as strong as they should be at the present time; removed from winter quarters June 9th; no pollen gathered until May 2nd; since then have got along nicely; loss 7 per cent., partly due to queenlessness; some swarmed out, some dwindled; fed a little sugar syrup; clover good; everything very late.

Renfrew.—Condition good when set out, but owing to extremely wet, cold spring, only fair now; loss 5 per cent., due to queenlessness; fed sugar syrup; white clover will be fair; alsike badly damaged by winter and spring.

Russell.—Bees have wintered extra well all through this district; bees are in good average condition at present; loss 5 per cent., due to queenlessness; fed sugar syrup and some honey; season a little late, but prospects are good for a good clover crop.

Stormont.—Removed from winter quarters April 10th to 15th; were in good condition, and mostly all are in good condition at present time; very little loss; fed clover and raspberry honey; alsike and clover partly killed by drouth of 1908.

Simcoe.—General condition of bees good; some spring dwindling; loss 12 per cent., due to queenlessness and lack of sufficient stores; fed sugar and honey, some basswood and buckwheat honey; clover a fair stand.

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Victoria.—Doing fairly well at present time, considering cold, backward spring; fed sugar syrup; clover and alsike about average; loss 17 per cent.

Waterloo.—Bees were in good condition when they were removed from their winter quarters, and some have dwindled, owing to cold, backward spring; loss 27 per cent.; think bees were kept at too high a temperature.

Welland.—General condition rather weaker than usual on account of cellar being too warm; have not built up rapidly this spring on account of backward spring; loss 9 per cent., due to starving and queenlessness; no feeding; clover good.

Wentworth.—Bees about one-half good and one-half weak when came from winter quarters; fed granulated cane sugar; loss 13 per cent.; late-hatched queens too weak; clover good.

York.—General condition of colonies fair; loss 21 per cent., due to queenlessness; some foul brood: most natural stores, white clover and alsike came through fine.

European Foul Brood

European foul brood, which has caused such havoc in the New York State apiaries, has arrived in Ontario, and inspectors and others should be very much awake to the fact. It is to be much more dreaded than the old kind of foul brood, for two reasons: First, because it runs its course and destroys an apiary much more rapidly, and, second, because the adult bees will clean out the diseased scales from the comb and scatter them in the yard and farther, to find their way and carry disease into healthy colonies. In the neighborhood of Trenton, apiaries are being wiped out something like this:

112 colonies reduced to 23 in two years.

180 colonies reduced to 21 in one year.

60 colonies reduced to 44 in one year, and the balance now diseased. These are samples.

Symptoms

These are brought out quite fully in the report of the Ontario Bee-keepers' Association for 1907, pages 32-40. Also E. R. Root in "Gleanings in Bee Culture" describes the symptoms as follows (page 342):

"It may look very much like ordinary dead brood or what is called "pickled" brood or "starved" brood. If the reader will imagine a slightly yeasty or sour smell, combined with a faint suggestion of foul brood, he will get an idea of the characteristic smell. But there is lacking the strong foul smell that one gets from ordinary foul brood, that has been so often likened to that which we get from an ordinary glue-pot. Most of the larvæ have died before sealing, in the early stages, while in the case of the old-fashioned foul brood, in the other stages, most of it dies after sealing. The dead larvæ do not lose their shape or form, neither does the matter rope except to a very light extent.

The symptoms of the Trenton cases are similar to this. The larvæ mostly die without uncoiling from their natural early position. The color in the earlier stages is lighter than the American foul brood. The smell may depend on the nose of the inspector, but to some it is very pronounced and offensive, like decayed fish; in fact, on a warm, moist morning, it is noticed upon entering the yard, and when a diseased comb is held up close for inspection, it is almost sickening.

Mr. Wooler is convinced, from two seasons' experiments, that if only a few colonies in a yard are infected, the only safe way is to treat the whole yard.

Others go so far as to say that, on account of the diseased scales thrown out, bees cannot be cured on the ground where they have been diseased.

Our inspectors should give particular attention to this disease and its treatment.

MENDEL'S PRINCIPLES OF HEREDITY

["British Bee Journal"]

By W. Bateson, M.A., F.R.S., V.M.H. (Cambridge: The University Press. Price 12s. net.) The author tells us that the object of this book is to give a succinct account of discoveries in regard to heredity made by the application of Mendel's methods of research. The theory of "evolution" and "origin of species" is so associated with the name of Darwin, whose celebration has so recently taken place at Cambridge, that one is apt to forget that there were others who for more than half a century had worked on the same lines, prominent amongst these experimenters being such men as Koelreuter, John Hunter, Gaertner, Naudin, Knight, and several others. In 1839 de Vries published a paper in which was foreshadowed a conception of unit-characters, which play so large a part in the development of what Professor Bateson has termed "genetics." It was in 1897 that Dr. Galton enunciated his law of heredity, which stated that of our total heritage we owe on an average one-half to our parents, one-quarter to grandparents, one-eighth to great-grandparents, and so on. Although there was a statistical accord between Galton's theory and some facts of heredity, in the practice of breeding there were already known so many classes of uncomformable phenomena that his statement could only be looked upon as more an occasional consequence of the laws of heredity than one of those laws.

The author of this book is the first Professor of Biology in the University of Cambridge, and is known as one of the most distinguished of her men of science. He has for a long time put forward claims on behalf of the discoveries associated with the name of Mendel. The new law of descent was made known by Mendel so long ago as 1865, and his work, forgotten for a time, was brought to light again in 1900 by de Vries, Correns and Tschermak, and it is

due mainly to Professor Bateson that the work of Mendel has served as an inspiration for recent research in heredity. The scientific world is now giving full recognition to this new law. There is no discovery in the principles of heredity that may compare with it since "The Origin of Species" appeared, and it is of infinitely more practical importance than that work. Mendel's law teaches that when pure stocks or strains are crossed it is found that certain qualities remain indestructible and appear uncontaminated in a definite proportion of offspring of all generations after the first. George Mendel, who was Abbot of Brünn, made known in 1865 this new law of descent, which he had discovered by the cultivation of peas and other plants, and also by observation of heredity in bees and other animals. This forms the subject of Professor Bateson's "Mendel's Principles of Heredity."

The essence of Mendel's discovery is that of segregation. We start from a common fact that all the ordinary animals and plants began their individual life by the union of two cells known as gametes. Each of these is supplied with certain ingredients or factors, which may be either the same in both male and female, or different. If both parent gametes bring in a certain quality, all the daughter gametes have it, but if neither brought it in, then none of the daughter gametes have it. If it came from one side only, then on an average it will be present in half and absent from the other half.

Mendel's experiments with the edible pea (*Pisum sativum*) are well known, and serve as an example of the general principles of his teaching. This is what Professor Bateson says:

"Mendel took a pair of varieties, of which one was tall, being 6 feet to 7 feet high, and the other was dwarf, $\frac{3}{4}$ feet to $1\frac{1}{2}$ feet. These two were then crossed together. The cross-bred seeds thus produced grew into plants which were al-

July, 1909

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ways tall, having a height not sensibly different from that of the pure tall variety. From the fact that the character—tallness—appears in the cross-bred to the exclusion of the opposite character, Mendel called it a 'dominant' character; dwarfness, which disappears in the cross-bred, he called 'recessive.' "

In the next generation the tall cross-bred bore seeds which produced many tall dominants and some short recessives, in the proportion of three tall to one short, or, in other words, 75 per cent. dominants to 25 per cent. recessives. It was found that if allowed to fertilize themselves the offspring of the recessives again produced recessives only, showing them to be pure to the recessive character, which in this case was dwarfness. But the tall dominants behaved differently, and when tested by a study of their offspring, instead of being alike, as were the recessives, gave plants which were tall only, and were therefore pure to tallness, and also plants consisting of both tall and dwarf, showing again an average of three tall to one dwarf. The ratio of impure plants to the pure plants was as 2 to 1. The total in the third generation consisted of 25 per cent. pure dominants, 50 per cent. impure dominants, and 25 per cent. of recessives.

Since the fertilized ovum was formed by the union of germ cells having tallness and dwarfness as factors, both these elements entered into the composition of the original fertilized ovum or zygote. If at some stage in the process of germ formation the germ cells are bearers of either tallness or dwarfness, there must be a separation of the two characters. This dissociation of characters from each other in the course of formation of the germs is called segregation. As Professor Bateson shows, such segregation is one of the normal phenomena of nature. Segregation determines the regularity perceptible in the hereditary transmission of differences and defines the units concerned in the constitution of organisms.

Another example will explain the discovery by Professor Bateson of the meaning of reversion, which has for a long time puzzled scientists and breeders. We know tall sweet peas breed true. Of dwarf sweet peas both Cupids and Bush breed true. Now Cupid crossed with Bush gives Tall. The explanation is of the simplest. Cupid is tall minus something; Bush is tall minus something else. In sporting out of Tall, Cupid did so by losing a certain factor which produced tallness. Bush, in arising from Tall, did so by losing another factor, which also made for tallness. When Cupid and Bush are mated together each supplies one of the missing links of tallness, and both necessary factors for tall are thus present in the offspring, which consequently are tall.

Not only is the Mendel law applicable to plants, but it is seen that they and animals, as such, do not show any difference in their manner of heredity. Inheritance on simple Mendelian lines has been also studied in reference to the structural characters of man, cattle, the horse, mouse, fowls, pigeons, canaries, etc. Animals and plants in which color characters have been shown to have a Mendelian inheritance are fully described, and Professor Bateson illustrates this part of his subject with fine colored diagrams, those of the lepidoptera, sweet peas, and *Primula sinensis* being particularly good, and clearly demonstrate the qualities to be emphasized.

Mendel's largest undertaking, besides the work on *Pisum*, was an investigation of the heredity of bees. Professor Bateson tells us that he had fifty hives under his observation, and collected queens of all attainable races, European, Egyptian and American, and effected numerous crosses between these races. He made attempts to induce the queens to mate in his room, which he netted with gauze for the purpose, but it was too small or too dark, and the efforts were unsuccessful. Unfortunately, the notes he made of these experiments cannot be

found, and it is supposed that in the depression which he suffered before his death they were destroyed. Professor Bateson visited the Königskloster at Brünn, hoping to discover some trace of the missing books, but was unsuccessful, although he saw the hives which had been used standing in their places.

In the book before us Professor Bateson demonstrates that Mendel, by the study of the simple character individually, showed that law and order reign in inheritance. Much has already been done in the study of the subject, and there is every indication that through Mendel's law we are likely to have important discoveries in the breeding of plants and animals, as well as in the improvement of bees. Anything Professor Bateson writes on the subject is sure to command attention, and we are sure that the clearness and fairness with which he has treated it in his book will be appreciated not only by biologists, but also by others who cannot but find much to enjoy in its pages, for he has the happy knack of not only making his writings instructive but also highly interesting.

BEEES IN GARDENING

Are Necessary to Ensure the Fullest Yields of Crops.

This is a topic on which the growers are not generally posted, and the losses annually are very heavy in some localities, especially in fruit-growing districts where there are not enough bees to do the natural simple duty of carrying pollen or fertilizing the blooms. There is probably no subject upon which the growers are so uninformed, or none into which it would pay them any better to investigate.

There exists in plants or flowers what corresponds to sexes in animals. In some kinds of plants both sexes are found in the same bloom; in some they are in different blooms on the same plant; in others they are on separate plants. In any case fruitfulness depends upon fertilization of the blooms by pollen from the stamen being transferred to the pistil of the fruit or seed-bearing bloom, usually called the female bloom.

This may occur in different ways, such as the ripened pollen being carried by

**The Western Fair Prize List
September 10th to 18th**

Class 57—HONEY, ETC.

Weights must be as stated below, or prize money will be withheld.

Sec.	1st	2nd	3rd
1. The finest and most tastefully arranged exhibit of Comb and Extracted Honey, Beeswax, the product of one exhibitor, put up in most marketable shape; not less than 400 lbs...	\$20	\$10	\$5
2. Comb Honey, 200 lbs. in sections, put up in most marketable shape and so that sections may be handled for examination in judging	10	7	5
3. Liquid Extracted Honey, 200 lbs., put up in most marketable shape	7	5	3
4. Comb Honey, 20 lbs., in sections, in best marketable shape..	5	3	2
5. Liquid Extracted Clover Honey, 40 lbs., in glass packages....	5	3	2
6. Liquid Extracted Honey, not Clover, 40 lbs., in glass packages	5	3	2
7. Extracted Granulated Honey, 20 lbs., in glass packages.....	2	1	50
8. Beeswax, 10 lbs.....	2	1	50
9. Honey Vinegar, half gallon, in quart glass packages.....	2	1	50
10. Maple Syrup, half gallon, in quart glass packages.....	2	1	50

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The two pr rainy and we were in bloom unfavorable fo at all. Pollen well, either, days. This fruits set in s seemed to be i Not long ag fruit belt of M me, and seeme in my few sv cherry trees as heard of them before. I aske and he replied he remember having any. prised when I

the wind like dust and falling upon the necessary place, or by being carried by insects crawling over the plants, but bees are absolutely necessary to produce some crops. In fact, nearly all the fruits and vegetables are dependent upon bees for fertilization of the blooms, and upon how well this is done depends the profit of the crop. No matter how fine the plants, or how abundant the blooms, or how rich the soil, the crop depends upon how thoroughly the blooms are fertilized.

Tomatoes and red clover are worked by the bumble bees only, but the honey bee is recognized as the greatest pollen-bearing insect, and the value of the honey produced annually is not one-one-thousandth of one per cent. of the value of the work performed by this most valuable of insects.

Perhaps no class of men realize this more than the hothouse cucumber growers, who keep a swarm or two in each house. In case anything happens to weaken a swarm so that the bees stop working, the plants stop setting fruit immediately and the blooms all shrivel and fall off. A great loss is caused in a few days if it is not noticed that the bees are not working.

The two past seasons have been very rainy and wet at the time most fruits were in bloom, and wet weather is very unfavorable for bees to work if they work at all. Pollen does not ripen or distribute well, either, except in bright, warm days. This explains why very little fruits set in some localities where there seemed to be a profusion of bloom.

Not long ago a fruit-grower from the fruit belt of Michigan chanced to call on me, and seemed to take as much interest in my few swarms of bees under the cherry trees as if he had never seen or heard of them being kept in captivity before. I asked if he did not keep bees, and he replied that he did not, nor did he remember of any of his neighbors having any. He seemed greatly surprised when I explained to him what I

have written here, and he told, with a long, serious face, how the fruit-growers in his locality had not had profitable crops for several years, not since the timber was cleared away for the box factories. The wild bees had always done the work, but now that there are very few wood lots in the district there are very few wild swarms as compared to the fruit and vegetable-bearing blooms. He went home with the determination to keep enough bees to do his work without depending on others to come a long distance.

Sometimes during a rainy spell there will be a few hours of bright sunshine, when bees will rush out and work desperately, and in their eagerness to gather the abundant honey would soon fertilize all the flowers near by. Honey bees do not fly very far if they can get sufficient honey near by. So it is very important that all fruit and vegetable growers should keep a few swarms of bees, and on very large farms scatter them out in different parts to make sure that they reach all plants.

I am not thoroughly posted on blooms of the different fruits, but strawberries are one of the best examples of the sexes of blooms. Some varieties of strawberries are "perfect flowered or bi-sexual," that is, both male and female are found on the same plants; they have the female or fruit-bearing flowers only, and other varieties from which the bees may carry the pollen must be planted close by or they will not set fruits.

Cucumbers, melons, squash and many other varieties of vegetables have both kinds of blooms on the same plant, the male blooms usually being in groups and the female alone. There are many times more male blooms than female. The bees do not seem to get anything from the female blooms and hardly stop, but they get close enough at any rate to fan some pollen from their bodies to the bloom before they find that there is no "mail" there for them.

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Tomatoes, eggplants, peppers, beans and peas belong to the class where every bloom on every plant is a fruit-bearing bloom if fertilized, and it is not necessary for bees to carry pollen from other plants or flowers, but the pollen must be transferred, no matter whether it is from another bloom or the same one.

Well ripened and dry pollen will get shaken on to the pistil in such blooms by the wind waving the plants, but not all the blooms will fertilize by any wind, and the bees are very much needed for this kind of blooms also. Why honey bees do not work on tomatoes is not known, but bumble bees are very fond of them, and efforts have been made to domesticate them for work on hothouse tomatoes in winter, but without success for some reason. Honey bees cannot reach down into the red clover blossoms, and the giant red clover could not be grown successfully in Australia until they imported bumble bees from America. The clover would grow, but would not go to seed.

Many growers unconsciously poison a great number of honey bees by spraying their trees with arsenates when the blooms are open. This is not the time to spray, and will do harm instead of good. It is positively useless to spray at that time, at any rate, and in some States it is prohibited by law.

Just before the blossoms open, and just after the petals fall, are the times to spray for the generally termed blooming period. Aside from getting their invaluable labor for nothing, the honey-bee can be made to pay handsomely if the owner takes the time to learn how to handle them. Much patience is required to be a successful bee-keeper, but it is interesting and profitable work—*Market Growers' Journal*.

FOR SALE—Small apiary in connection with small store in centre of village; one acre land covered with first class fruit trees realizing \$100. a year. in first class alsike, raspberry and buckwheat locality, nice home and cheap. Address "Yard" *Canadian Bee Journal*.

EARLY AND LATE INSPECTION WORK

The foul brood situation in Ontario is a burning subject. It appears that, for the sake of economy, the Ontario Government has practically decided that, except in aggravated cases, the inspectors are not to go out until May 15, and then only a limited number of days. The idea was that foul brood in its early stages cannot readily be detected until brooding is carried on rather extensively. This is quite true; but in the meantime the disease may be spread very much by neglected colonies that have dwindled or died, and that have diseased honey which may be robbed out. If one or the other plan had to be followed, it is just a question as to whether the early inspection would not do more good than the later one. At first thought the former would appear to me to be preferable, because foul brood would likely be discovered in the hives already mentioned, and robbing prevented. Again, the careless bee-keeper without inspection uses for swarms the combs upon which the bees have perished, and this would be prevented. Even when there is but little brood in the hive, badly diseased colonies could be detected. It would be only the slightly affected colonies that might pass muster.

I quite agree with the "*Canadian Bee Journal*" and many of its writers in upholding early inspection; and with a Provincial Apiarist now appointed, whose duty it should be to advise upon such matters, we may see a good apicultural policy develop. The present stand taken by the Provincial Government that only \$2,500 be spent this summer for foul brood inspection is also a mistake. A wealthy province like Ontario can well afford to spend \$10,000 in a season if, by that expenditure, foul brood can be brought under control more quickly. There are portions of this province in

July, 1909

which the brood exists inspected, means. The course, quite of Agriculture dit for the of the grant \$2,500 per enough.

Jacob Al said recently inspectors.

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PENNSYLVANIA
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The Pennsylv Association will in Lebanon, P 9th. An excell pared, as usual in a later issu attend a good c to attend this.

which there is every likelihood that foul brood exists, but which have not been inspected, owing to lack of men and means. This should not be. We are, of course, quite ready to give the Minister of Agriculture and the Department credit for the increase within three years of the grant for this work from \$600 to \$2,500 per annum, but it is not yet enough.

Jacob Alpaugh, one of the inspectors, said recently that we needed a thousand inspectors. When I demurred he said, "Years ago you and a lot of others opposed my views given in convention, but you had to come to it." I admit that, but I do not expect to change my views in this: I would appoint no man who is not competent, and I feel sure that at present one thousand good men could not be found. The Ontario Bee-keepers' Association could well devote some time at its next meeting in Toronto, in November, to a discussion as to the most efficient manner in which a foul brood inspector should carry out his duties, and by all means let laymen take part. Anything that will not stand the light of cool, deliberate debate and reasoning should be eliminated. No one need be ashamed to learn in this matter. The best of us make mistakes, and all should be open to advice given in a proper way. A wise man will follow advice given in even an improper spirit if such advice is sound.—R. F. Holtermann, in "Gleanings," July 1st.

PENNSYLVANIA STATE BEE-KEEPERS MEET

The Pennsylvania State Bee-keepers' Association will hold its next convention in Lebanon, Penna., on Sept. 8th and 9th. An excellent program is being prepared, as usual, and will be announced in a later issue. Those who desire to attend a good convention should not fail to attend this.

COST OF BEESWAX

Do the Bees Secrete It, Involuntarily, to Any Great Extent, Unless Compelled to Hold Honey?

(“Bee-keepers Review”)

How interesting are those questions that can't be answered definitely, that we can theorize about, and get a different answer each time. The secretion of wax, and the building of comb, and all the minor factors that cluster around them are not only intricate, but there is really a practical side to the matter, a commercial side, and it needs studying more and more.

C. P. Dadant, in a recent issue of the "American Bee Journal," uses several columns in considering this problem, and writes not only in an interesting manner, but brings up a lot of practical points. It is a little lengthy, but well worth reading. Here is the article:

Should the bees be allowed to build the combs? Is there a waste of wax when the hive is supplied with already-built combs for the harvest? These questions mentioned in the "American Bee Journal" for February (page 37) have lately been discussed both in this country and in Europe, with entirely different conclusions by different writers. The matter under study can never be positively decided, because of the different conditions in which the production of wax is carried on. Experiments on the cost of wax in pounds of honey have been made, and the amount of honey needed variously estimated at from upwards of 20 pounds down to 2 pounds for each pound of comb. The last-named estimate was given by a foreign writer, who has so little practical knowledge of bee-culture that he condemned the use of the honey extractor as altogether impracticable. On the other hand, the scientists who tried the experiments of feeding bees, and found 20 pounds as needed to produce a pound of wax, were doing this in too artificial a manner to secure as good re-

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sults as must be secured in the height of the honey harvest.

It is evident to me that the amount of honey consumed in producing a pound of wax varies greatly, even in favorable circumstances, just as the amount of corn or cereals needed to produce a pound of fat in our domestic animals varies under different circumstances. This comparison is supported by most scientists. Cheshire compares the conditions necessary to produce wax to those needed by chickens to fatten—confinement, bodily inactivity, warmth and high nourishment.

But must the bee produce a certain amount of beeswax whether she is willing to do so or not? In other words, must an amount of wax be produced, which, if not used to build combs, will be thrown away or plastered over the walls of the hive?

When the bees are filled with honey, and have no comb in which to deposit it, there is no doubt that they hang in clusters, "in warmth and inactivity," until this honey is changed into wax. It was once believed that a certain part of the bees were "comb builders," and that their sole occupation was to build combs; that they differed from the field workers in appearance, being larger in the abdomen and less active than the others. This was asserted by Huber, who, with the help of his faithful Burnens, made such accurate discoveries. But Huber had no means of discovering what was later ascertained by the introduction of the Italian bees, that those bees which he named "comb builders" are the young bees before their first flight, and that these bees become field-workers in their turn. They are wax-workers when wax producing is necessary at the time when they are too young to go to the field. But when the combs are full, from one end of the hive to the other, then all the bees must become wax producers, as there is no other way for them to get rid of their honey.

Huber and others since have ascertained that all the bees are capable of pro-

ducing wax when their honey-sac is full and cannot be emptied. It is also evident from the testimony of a number of writers that at the time when the adult bee is constantly carrying honey to the hive, the wax-producing organs are more or less active, and a small amount of honey is constantly being changed to wax.

In all my experience with bees, and while producing extracted honey, supplying the bees with supers full of empty combs already built, I have never seen the bees waste wax, except when the combs were full, and there was no more room to build other combs, and no full combs to seal. In one or two instances I have seen wax scales wasted, but in each of these cases there was room to spare; the waste was caused by a sudden change of temperature, and I ascribed it in each instance to the inability of the bees to keep up the warmth of the hive, the scales of wax becoming too tough to be manipulated and had to be thrown away. Such instances are so rare as to be hardly worthy of notice.

When the honey harvest begins, and there is plenty of empty combs for the bees to store the honey, there is very little wax produced. That which is brought forth is used to lengthen the cells which have been cut down during the winter and spring while consuming the sealed honey, for any of our apiarists know that the cappings are cut away and wasted when the honey is used. So the bees repair their combs and "whiten" them—a process well known to both comb and extracted honey producers at the opening of the crop. Should we consider this whitening of combs as a waste? No, for the wax is placed where it serves the bees, and it is sufficient to say that they always do it, whether they have room for new combs elsewhere or not. But they always place honey in the cells, and have them fairly well filled before this whitening goes on.

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judgment, evidently) or waste wax otherwise by plastering it on the walls, as they had plenty of empty combs within their reach.

It appears to me that we can very easily reason the bees' action in comb-building. When the crop is light their stomachs are never crowded. Only for a few minutes at each load does a bee find opportunity or desire to pass into the digestive organs more honey than is absolutely necessary for its sustenance. When it reaches the hive, and hands over its load to a young bee, the latter easily finds a storing place for it. Then there is no inducement for either of them to build comb or to consume honey in comb-building. But when the crop is well on, or sudden; when each adult worker brings home a full load and at once goes back for more, with all the eagerness of a miner who has found a fortune, then all the combs are soon filled. If the apiarist has not provided an extra supply, the young bees, after filling all the cells, have to retain in their honey-sacs as much as they can possibly contain, since the harvest keeps arriving from the field. Then it is that wax-production is not only welcome, but involuntary, for there is no other way of overcoming the difficulty.

Every apiarist who has opened a crowded hive at the time of a sudden and plentiful harvest has noticed how full all the bees look, how sluggish they appear, hanging to each other in festoons, apparently idle, waiting for their honey to change into wax so that they may build more combs. Should there be no room for more combs, the wax would have to be wasted unless the bees swarmed. This waste will not take place as long as there is a single cell to finish, a corner to fill, a cell to seal. Open a hive in this condition and supply it at once with empty combs and the conditions will change. You will immediately see a new activity. They deposit their honey and rush to the fields again. Those that

have produced wax scales utilize them to repair the combs given them, as well as to strengthen these combs.

The evidence of the great cost of combs to bees is visible, it seems to me, in the economy with which they build these combs. How light and fragile they are! If wax cost them next to nothing, they would surely build them stronger at first. But it is only when they handle over old combs that wax is added to them to make them strong—they add a little here and there. Is that wasted wax? Not by any means. If you are a producer of extracted honey, you know how much nicer it is to handle a comb which is several years old, for it is much tougher and less liable to break than the new combs just built.

In my experience, I have found no more waste of wax in the production of extracted honey than in that of comb honey. As long as your bees have room there will be no waste of material, but whenever the combs are full and sealed, and every space crammed, there is a chance for waste of both honey and wax, whether you are producing comb or extracted honey.

That the bees must produce more or less wax during a harvest does not admit of a doubt, but that they must produce enough wax to store all the honey they harvest, and that the supplying of combs already built is a waste, I cannot admit. Far from that, I hold that in locations where the harvest is sudden and very large for only a few days, there is a positive loss in compelling them to build their combs before they store their honey. In countries where the flow is gradual, beginning with a few ounces per day, increasing steadily to a few pounds, the loss from lack of combs is smaller. But when the honey flow is delayed by unfavorable atmospheric conditions until the blossoms are in profusion and the harvest begins with a rush, there are days when the bees are actually compelled almost entirely to suspend op-

erations in order to secure combs to store their crop. The loss is then threefold. There is the actual cost of the wax in honey consumption; the loss of time to the bees whose abdomens are full and that cannot harvest more until they can unload; and the loss in breeding caused by the filling of all available cells with honey, in the brood nest as well as the supers.

Some will say that such sudden crops are rare. Not in this part of Illinois. Our crops are sudden and short. We have weighed hives at times to ascertain the amount gathered each day, and we have several times noticed an increase of 18 to 19 pounds in one day. This weighing of colonies is not carried on as persistently on this side of the Atlantic as in Europe. The "Societe d'Apiculture pour la Suisse Romande" publishes statements every year of weights of hives regularly taken in different localities. Such a statement was published in the

December number of their Bulletin, from twenty-three different localities. Those reports show plainly how sudden crops may be. In some instances crops of 11 pounds are recorded following a day of entire failure. In one instance there is a record of 9, 10 and 11 pounds of increase for six or seven consecutive days. Bear in mind that these large crops are made with extracting supers filled with combs. I doubt very much if such crops would be possible if the bees had to build their combs, no matter how favorable the circumstances might be.

The reader knows that we are almost exclusively producers of extracted honey, but there was a time when we produced comb. I never could secure results at all adequate when the bees had to build their own combs. At one time we had an apiary of 87 colonies with all supers full and the crop still on. We went to extracting and took off about 5,000 pounds in three days; at the end of the

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July, 1909

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third day we examined some of the hives extracted two days previous and they did not have a single cell without honey. It would have been utterly impossible for those bees to gather the fifth of that amount if they had had to build the combs. Yet there was no waste of wax, because the bees were not compelled to retain honey long enough in their stomachs to digest it into beeswax. The production of wax was at its minimum, while if they had had to build combs it would have been at its maximum.

I have never heard of more than two instances where it was found necessary and advisable to produce wax as much as possible. The first was reported by an apiarist of South America, living away from civilization, with very inadequate means of transportation. He could not secure more than about three cents per pound for his honey, and found it profitable to have as much as possible of it converted into beeswax, by cutting out the combs and allowing the bees to rebuild. The other is reported by Dr. Phillips on Hawaiian Bee-Culture, "Bureau of Entomology, Bulletin No. 75," a very interesting report concerning the status of apiculture in Hawaii. It appears that the bulk of the honey produced there is from honey-dew of different kinds, but dark and of poor flavor. This is so inferior an article that Dr. Phillips suggests that it may pay to have this honey transformed into beeswax.

But in our case I believe it pays to economize the wax as much as possible. I do not have very far to find corroborative testimony to support my view. In "Cleanings" for February 15, 1909, page 102, Mr. Louis Scholl narrates how he accidentally supplied a number of colonies with supers containing starters only, while a similar number of other colonies were supplied with full sheets, and the latter yielded a crop averaging \$1.10 per colony more than the others, after paying the excess of cost of the wax supplied in full sheets.

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If the beginner will carefully take note of the above explanation and experiment for himself, I think that he will readily ascertain that we run no risk whatever of loss of wax as long as we keep the bees supplied with a sufficient number of

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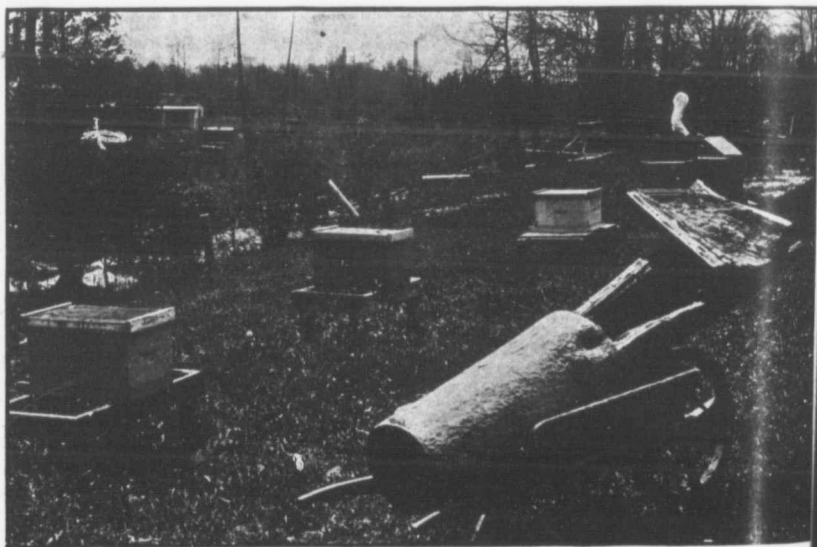
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A BEE LOG GIFT TO MR. TEBBS, HESPELER



HONEY AND BEES REMOVED FROM LOG—INSPECTOR D. CHALMERS AT WORK

(See article published last month)

July, 1909

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combs for storing honey. The wax produced will just about keep pace with the lengthening of the cells to proper size, and the sealing of honey as it matures.

(Continued from page 246)

animals, being very mucilaginous and nutritive, though liable, it is said, to injure the quality of the butter made from the milk of cows fed upon them. The best-known species are the American basswood (*T. Americana*) a stately tree often exceeding 75 feet in height and 10 feet in girth. Its range extends from New Brunswick to Minnesota and southward to the elevated land of Georgia and Texas. In the more thickly-settled parts of this region it is becoming scarce as a timber tree because of the great demand for its wood. In America it is the most frequently planted species. Owing to the confusion in nomenclature, the name, "European linden," is applied to at least

three species, *T. platyphyllos*, *T. vulgaris* and *T. ulmifolia*. The first is most widely planted in America. The last is very late in blossoming and should be more extensively cultivated in order to extend the season of honey production. Lindens all thrive best on good land. They are easily propagated from seeds, layers, and grafts, and by "stooling," the small trees being cut down close to the ground, the sprouts covered with soil, and when rooted removed to nursery rows. In some countries the fibrous inner bark of the linden is separated by soaking in water, and manufactured into fishing-nets, mats, shoes, and clothing; and the cordage made from it is said to be remarkably strong and elastic. The wood is sometimes cut into thin strips and used in the manufacture of chip hats, which resemble those made of straw.

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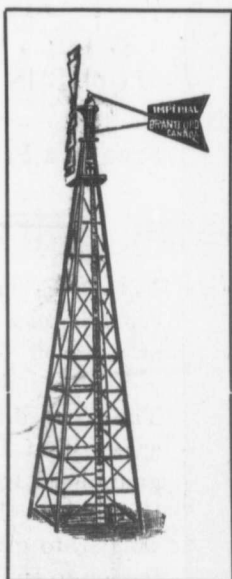
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