

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/  
Couverture de couleur

Coloured pages/  
Pages de couleur

Covers damaged/  
Couverture endommagée

Pages damaged/  
Pages endommagées

Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée

Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées

Cover title missing/  
Le titre de couverture manque

Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées

Coloured maps/  
Cartes géographiques en couleur

Pages detached/  
Pages détachées

Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)

Showthrough/  
Transparence

Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur

Quality of print varies/  
Qualité inégale de l'impression

Bound with other material/  
Relié avec d'autres documents

Continuous pagination/  
Pagination continue

Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Includes index(es)/  
Comprend un (des) index

Title on header taken from:/  
Le titre de l'en-tête provient:

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Title page of issue/  
Page de titre de la livraison

Caption of issue/  
Titre de départ de la livraison

Masthead/  
Générique (périodiques) de la livraison

Additional comments:/  
Commentaires supplémentaires:

This item is filmed at the reduction ratio checked below/  
Ce document est filmé au taux de réduction indiqué ci-dessous.

|                          |                          |                          |                                     |                          |                          |
|--------------------------|--------------------------|--------------------------|-------------------------------------|--------------------------|--------------------------|
| 10X                      | 14X                      | 18X                      | 22X                                 | 26X                      | 30X                      |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 12X                      | 16X                      | 20X                      | 24X                                 | 28X                      | 32X                      |

# CANADIAN BEE JOURNAL

PUBLISHED MONTHLY.

NEW SERIES  
VOL. VI, No. 10.

BRANTFORD, ONT., APRIL, 1898.

WHOLE No.  
398

I have been asked to give in the April number the plan of an apiary. The question for the present number is **Plan of an of THE CANADIAN BEE Apiary.** JOURNAL happens to be along the same line. In laying out an apiary, several points must be kept in mind. First of all, the location has to be considered. Where there is plenty of room I believe in keeping the hives well apart. I am not sure, but I am inclined to think that many bees humming, flying and roaring about in a limited space tends to swarming. Then we want to study convenience. I like to keep well out of the range of flight, and for that reason have two rows back to back, and room enough to wheel a barrow or walk between. I arrange the hives in pairs and work from the side. I dislike irregular setting when examining hives, extracting, etc., as it is a difficult matter to keep track of those which have been examined. A tree, a shrub, any small landmark, materially assists the bees in locating themselves. Order, neatness, convenience, and the like, are no mean factors to consider when locating an apiary.

At this date of writing, March 14th, all genuine colonies of bees have been placed on their summer stands. Every colony that came wintering and respects. from the cellar came out alive. Mr. S. T. Pettit, Brant, Ont, who certainly understands wintering of bees, was here while some of them were set out, and he stated

they had wintered well. We have been able to set them out much earlier by taking a horse and scraper and clearing the snow away from the apiary. The first were set out on the 6th and 7th, and many more on the 10th and 12th.

So much for our own apiary. As far as present reports go, which, however, may be quite misleading, bees have wintered well. I do not like unseasonable weather and hope that we shall not have sufficient warm weather to bring maple into blossom, and then have cold weather during the time it blossoms. Such weather prevents bees from building up.

Clover has come well through the winter. It caught well last fall, and although it may yet be injured there is much in favor of the contrary. This should be the year for Linden to yield. Bee-Keepers, if present prospects continue until the first week in April, should prepare for a good honey season. Remember, if you all wait until the last minute, and then expect to be supplied with goods promptly, many will be disappointed.

\* \* \*

A small space left in the editorial page gives me a chance to say that in sheltered spots soft maple is in full bloom at this date of writing (March 19th). In more exposed localities, however, it is not so far advanced, and if the weather keeps cool it may not be out for some time. Bee-keepers should make sure that their bees have plenty of stores to draw on, and then leave the bees alone.

## Success in Bee-Keeping.

BY THE EDITOR.

If there were two points in bee-keeping I would single out as the most important in management, and not generally recognized, they would be, "wintering bees with the least loss of vitality," and "keeping the bees from having the desire to swarm when there is a large number in one colony." I first headed this article "Notes for Beginners," but I could not do so with sincerity. What I am about to say should certainly be of value to beginners, yet I feel equally assured that there is many a bee-keeper considered advanced, who can read and follow out the suggestions I am about to make with profit.

At this date of writing another winter has passed, and the experiences of another winter have, I trust, enriched me in apicultural information. Some seventy-five colonies were wintered in the cellar, and although some were very light, every one, I believe, is in good condition. I have had quite a number of bee-keepers see the bees during the winter, among them, Jacob Alpaugh, S. T. Pettit, Chris. Edmondson, and all thought they were wintering well. The bees clustered very quietly.

I wintered with artificial heat and constantly gave fresh air. During the past year a shaft of cold and fresh air was brought from outside into the compartment which contained the stove, and from this the warmed air was distributed, by means of pipes, into the bee cellar, and a pipe again took the foul air away from the cellar. I enlarged the fresh air pipe to fourteen inches square. Last winter it was only four. I find this an improvement. The pipe contains a slide which regulates the size of the pipe. The cellar, as far as possible, was kept at about 42°. During the time that the outside temperature was above freezing, and the nearer the outside temperature approached to the inner the greater was the difficulty in securing a change of air in the cellar. I have studied and planned in this direction for years, and at last I believe I have a method by means of which a steady change of air can be secured at all times and at no great expense. Also that an even temperature can be secured. My

plan is this: By means of a simple clock-work arrangement an air pump is worked in the shaft; and as it is not intended to form a vacuum in one compartment, or compress the air in the one into which the air is being pumped, there will be no great pressure on the pump and it will work very easily. As fresh air is pumped into the cellar an equal quantity must be forced out, and in this way a regular quantity secured irrespective of temperature, velocity of wind, etc. Now to regulate the temperature of this air, it can be forced when the weather is cold through the stove compartment; or when thawing in winter or towards spring the temperature rises, this air can be pumped through a shaft containing a block of ice. It may be said this costs something; but what is an outlay of \$25 or even \$35, good for twenty years or more, when we can husband thereby the vitality of 100 colonies of bees.

There are too many content with bringing bees through alive, or with some bees in the hive still alive, when it is a question of, how little vitality has been lost during the winter.

The cost of the production of honey is, to a considerable degree, dependent upon this. Winter better, get a larger honey crop, cheapen the cost of production, and you will have larger profits from your apiary.

### KEEP STRONG COLONIES.

Another factor of immense importance in bee-keeping, cheapening the cost of production and getting the largest profits from an apiary, is to keep bees from desiring to swarm when strong. There is no difficulty in keeping bees from swarming when they are weak and do not fill the hive, but when they fill the hive and are gathering a full quantity of honey and especially when running them to secure a nice lot of comb honey it requires good and careful management to keep them together and get good returns from them.

The larger the number of bees that can be kept together in a contented way the better. As in a business, so many dollars worth of goods must be sold at a gross profit before the fixed expenses of a business is paid for. Or in live stock, when fattening animals it takes so many pounds of food to keep up the requirements of the animal, and what is digested, beyond that goes to give the increased weight. So in bee-keeping we have a problem on a somewhat similar basis. It takes so many bees to do the work of the hive; that is build comb, attend to the queen, feed the larvae, keep up the warmth of the hive and

gather the honey necessary for their own use, which is much more than many imagine. Of course, the amount of this work collectively, varies according to the number of bees; that is, a strong colony has more work to perform than a weak one, but the proportion per bee, other things being equal, decreases as the number of bees increase. The stronger the colony the more they are able to do for their owner. Hence there may be bees to just provide for themselves, when under the same conditions, twice the number of bees would give the owner a surplus of 6 lbs per day. I think the idea is so clear that even the beginner will understand. Now supposing it takes 20,000 bees to balance accounts, and bees are hatching at the rate of 2,500 a day. When there are enough bees in that colony to have a large number storing for you, then they swarm. Two homes have now to be provided for before the bee-keeper can get returns, and two colonies have to be provided with winter stores where there was one before, and the result will be that, although your apiary may increase, your returns have decreased. I venture to say that the conditions where it pays to go in for increase at the sacrifice of surplus are rare. Even a beginner who sails into the business with flying colors will, in the end, find that he could have made as much progress if he avoided undue increase—in short, work for SURPLUS not INCREASE. Many swarms generally give weak colonies to go into winter quarters, and these are not desirable for that purpose.

Now how shall we prevent undesirable increase? By giving the bees room in time, giving them enough of it, shading and ventilating the hive. I believe also that where the bees are placed closely together and they are excited by many neighboring bees flying, they are more inclined to put on the swarming impulse. Supers should be put on the hive before the bees get the swarming impulse. Generally the drawing out of the cells along the top of the combs is an indication. Now in comb honey, over half of the bee-keepers of our country are trying to economise by using only one super with twenty-four or twenty-eight sections. Where are the bees going to be storing honey while they are giving the finishing touches to their sections? They have the brood chamber pretty full before. Echo says where? This not only gives the bees the swarming impulse, but they lie comparative idle until they do swarm when they might be gathering so much a

day. Call a man foolish who would allow his grain crop to shell out standing in the field. The principle is the same. When one lot of sections are beginning to be capped and you have reason to expect more, raise it and put under another super. In extracted honey two supers can be used to good advantage, although, many do not believe this. Full sheets of foundation in the sections and foundation in the frames.

Now for ventilation! Instead of entrances sometimes three-eighth inches by about five, have them clear across the front of the hive, and when hot weather comes put a wedge at each side of the hive and between it. Make the bottom board of a seven-eighths inch piece square, the length of the side ripped across diagonally, giving two pieces, seven-eighths at one end and coming to a taper at the other. This closes the sides of the hives and enlarges the front entrance seven-eighths inches across the front of the hive. Shade should be given, protecting the hive from the rays of the sun during the warmest part of the day. Then hive the new swarm on the old stand. All this tends to prevent excessive swarming, and it will cheapen the cost of production to many. This article is a great deal longer than I intended it should be when I began.

---

### Spring Management of Bees.

— A. BRIDGE.

The paper on "The Management of Bees in the Spring", by Mr. Sparling, is very good. He speaks of setting bees out part at a time. I used to set my bees out in this way, part at a time, and have found it to be a bad practice, so I now set them out all at once. The first lot set out will take their cleansing flight, and mark their location, and then they are ready for robbing. The second lot set out will take their cleansing flight, and the lot set out first will commence robbing those coming later. I don't have much trouble with my bees robbing, since I adopted the plan of setting them all out at once. I believe in setting out early in the spring. If there should come a cold spell after they are out it will do them no harm.

I am not particular about having every hive sit on its old stand. I am of the opinion that the bees mix up considerable

when they are not put on their old stand, but I have never practiced doing it, and have never seen any bad results come from it, as they seem to be all one family when they are first set out.

When I carry my bees out, I mark all hives that are light L, and all that are heavy H, with a piece of chalk, then I equalize the honey by putting one or two frames of honey in the light hives taken from the heavy hives. I put a cushion on each hive and make the entrance very small. As soon as the weather gets warm enough to open the hives, I go over each hive and find out what condition they are in. Those that are strong I leave as they are, (I DO NOT SPREAD BROOD); from hives that are very good, and yet not full of bees, I take out what combs they do not cover, and put in a division board; those that are weak I double up by putting three or four into one. I do not have any dead bees to clean out of my hives, as I use loose bottom boards, and I pack up my bees for winter with the bottom boards off,

I am very careful to know that every hive has plenty of stores. I am one of those kind of bee-keepers that do not believe in everlastingly tinkering and fussing with my bees in the spring. As soon as I find that I have a good laying queen in each hive, and plenty of stores, I give them a good letting alone, and I think I generally come out as good as most bee-keepers. I have had my bees average me 100 lbs to the colony, spring count, for four years in succession.

West Brook,  
Co. Frontenac, Ont.

### Foul Brood.

—BY ELLIOTT J. RIEN.

If this is the law, that I am trespassing in following my property on my neighbours' land for the purpose of bringing it home, the sooner it is altered the better, or my neighbour should be made to deliver my bees safely to me or take consequences. The same as if my cow or horse got on to his farm. It might be worth while to get up a test case suing for value of swarm as Mr. Abram suggests.

If Mr. Shaw will see that there are some

eggs and larvae in his nuclei until the queen commences to lay he will not lose his virgin queens. Another method is to, if you have not any eggs or brood available, go to nuclei and as soon as the queen can fly take her off the comb and bring her outside, and let her go at entrance. Repeat this a couple of times, at intervals, finally making her fly in the air. I have never lost a queen so treated.

Sparrows are generally pretty smart birds, but, Mr. Sparrow, there is a difference between a queen being mated and a queen laying. Sometimes she does not lay for four or five days or a week after mating, so Mr. Editor's bees and yours are of a kind after all.

I do not know about anxiety being the cause of failure in introducing, but when I am too confident and neglect to keep a close eye on them, is generally the time I come to grief. By the way, can you get a better cage, than the old pipe cover?

Send us nails with hives in flat, that is good. In places like this it is difficult to get suitable nails and delay often means loss. Now then, supply dealers, is this not worth considering?

About adulteration. There is a place in Lerry Street, Sidney, where, I have been informed on the best authority, honey is made. I have eaten the made stuff. When will these people be stopped!

After all that has been written about foul brood one would think we knew something definite about its origin, yet we hear now it is caused by chilled brood. I quite agree with Friend Abram that chilled brood will not cause it. I have had any quantity of chilled brood, even black stuff, and yet never saw foul brood in my hives. Only a fortnight ago some men chopped a tree down and left the comb lying about exposed to rain, etc. I went two days after, got the bees, fixed the combs in the hive, chilled brood and all, and yet foul brood has not come yet. The fact of the matter is foul brood is a bacillus disease and chilled brood forms a good breeding ground for places where foul brood germs are in the air. I have yet to learn we can originate a bacillus any more than we can hatch a queen without an egg. There must be a spore to start from, and this coming into a hive of sick bees or chilled brood starts the mischief just as the germs of typhoid and other diseases attack only weak subjects. I am convinced if there are no germs of foul brood about, chilled brood can never cause the disease, in spite of Mr. McEvoy's opinions.—The Australian Bee Bulletin.

\*\*\*\*\*  
 \*\*  
 \*\* Directly Personal. \*\*  
 \*\*  
 \*\*\*\*\*

The portrait which appears on this first page of our twenty-fifth yearly volume will come as a surprise to some who—along with ourselves—know how persistently the original of it has refused his consent to “appearing in public” in this form. However, the writer—while freely confessing to not a little embarrassment as to the effect of its appearance, under the circumstances, upon his senior—having assumed the responsibility, must perforce face all the consequences of his action.

Whether or not modesty in a public man is recognized as a useful quality, or otherwise, we will not stop to inquire, but, to the writer at least, it has always seemed a remarkable thing that, while men more or less eminent—or even “prominent”—in the world of bee-keeping have been made familiar to all interested in the literature of the pursuit by their portraits, the one among the whole who (it is not too much to say) probably is better known and more universally esteemed the wide world over than any other, has gently, but firmly, withheld his consent to any publicity of this kind for himself.

The unique position held by Mr. Cowan as a bee-keeper is, no doubt, in a measure due first to his being a frequent traveller in foreign countries, and second his power as a linguist. Thus, to be present in the flesh with Russian, German, French, Italian, or we don't know how many other nationalities of bee-keepers is one thing, but to be able to converse with them in their own several tongues is quite another, and gives rise to a feeling of brotherhood altogether beyond a mere hand-shake. This, together with an extensive correspondence with bee-keepers and scientific men who are interested in bees, dwelling in nearly every quarter of the globe, makes Mr. Cowan's position, as we have said, unique. It is also mainly due to our senior Editor's fondness for foreign travel, and the fact of his being at the present time some six thousand miles from King William street, that the writer, having determined to take upon himself the consequences of his present step, is enabled to do so with the comforting assurance that the mischief—if it comes to be regarded as such—will be done without the risk of a hurried “wire” to “stop press” and “leave out portrait.” Besides, any misgivings we may have are somewhat

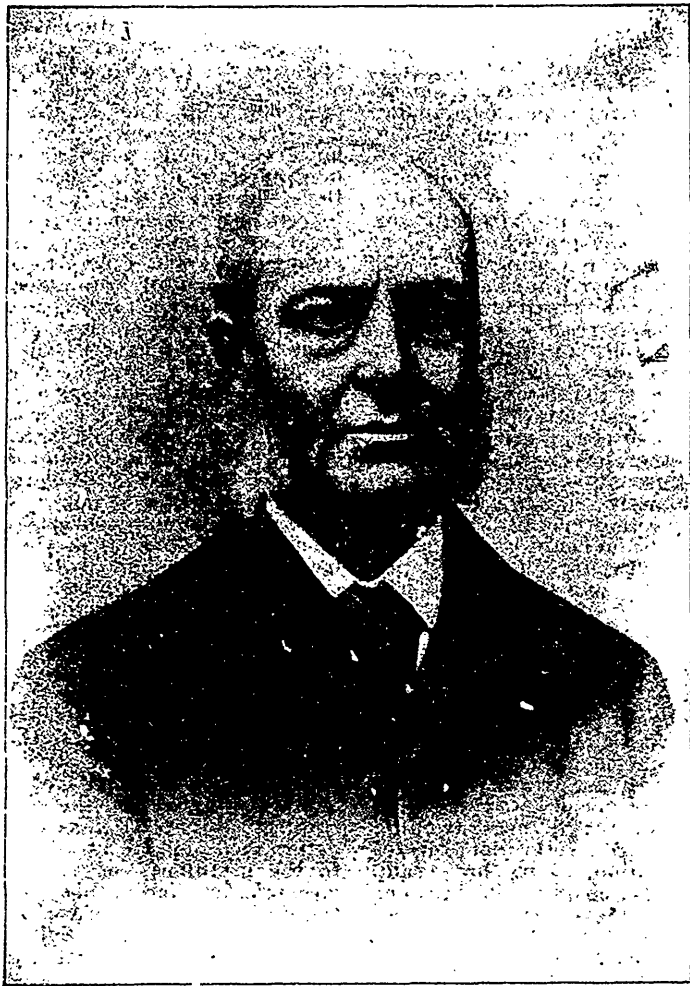
modified by the fact that these lines will be first seen and read by the subject of them in far-distant California, most likely amid summer warmth and bright sunshine; and we trust that their import will arouse feelings more in consonance with the surroundings than the testiness usually associated with London fogs and the hard frosts of a British winter.

It has been more than once asked why Mr. Cowan's portrait did not take its place among those of bee-keepers which appeared in this (his own) paper a year or two ago? Well, beyond what is stated in the opening lines of this article, we have never been able to say why. Being, however, already possessed of an excellent portrait in the photo, from which the illustration is reproduced, the present occasion seems to us so appropriate for its appearance that we make no further apology than reminding Mr. Cowan that on leaving this country a few weeks ago for a prolonged absence, he was good enough to entrust the writer with a “free hand” to do as he thought best with the Journal and its affairs. We have, therefore, decided as above, and also to say a few, (very few) words regarding its proprietor. In doing this we shall—to our certain knowledge—add to the interest of the occasion (as we hope) without offending the susceptibilities of the senior editor himself, seeing that no more appropriate opportunity could well arise than the commencement of the volume which will, when ended, complete a full quarter of a century's existence for this paper.

As is known to old readers, the British Bee Journal was purchased from its founder and first editor, Mr. C. N. Abbott, some ten years or so after its inception in 1873, by the Rev. H. R. Peel, a gentleman enthusiastically devoted to the encouragement of bee-keeping as a means of adding to the minor industries of the country, and also of increasing the income of the rural population. Being also at the time determined to make an effort for adding to the usefulness of the British Bee-Keeper's Association—just then somewhat falling in the energy of its leading spirits, from the lack of the requisite funds for carrying out their labors—Mr. Peel thought that this work would be aided by the possession of an official organ, independent and entirely freed from even the suspicion of any trade interest connected with it. He therefore, as we have said, bought the paper outright, and, being possessed of ample means, was well known to have given no thought to profit from its publication. On the death of Mr.

Peel in 1885, the paper was taken over by Mr. Cowan, not from any desire on his part to engage in journalism, but at the earnest request of Mrs. Peel, who was anxious for a continuation of the purpose and objects her husband had in view at the time of his death. The B. B. J.,

his predecessor, and the same willingness to give effect to them. Especially is this the case with regard B. B. K. A. (of which he has for many years been chairman) having a perfectly independent organ to represent its interests. Hardly less does he realize the need for bee-keepers of all



THOMAS W. COWAN, F.L.S., F.G.S., ETC.

therefore, still occupies the by no means common position of not being "run" for profit—as the trade phrase goes—or in the interests of any supply trade, but because its proprietor entertains the same view as

classes possessing a journal by means of which they can interchange views, and receive such help as its pages afford in following the pursuit.

Having, then, gone so far, and, for the

reason stated, carefully avoided intrusion into matters too directly personal, we cannot resist the desire to raise a corner of the curtain Mr. Cowan elects to place between his journalistic duties and his labors in other directions, just to say—to those who know him only in the former capacity—that hard and continuous work in the cause of charity, religion, temperance, education; in fact philanthropic effort of all kinds, occupy by far the greater portion of a very busy life while in this country. Indeed, he regularly overtaxes his strength in this way when occupying his London residence, and after getting “run down” in consequence, as regularly has to go abroad in order to secure the rest and change which impaired health demands. In this way it is his delight to occupy himself in such journeys as he aptly described under the title of “Bee Rambles in Savoy” a year or two ago in the pages of this journal. Had we been free to write of Mr. Cowan as our impulse dictates, these lines would probably have taken a different form, but realising the whole position, we feel that enough has been said if we would avoid even the resemblance of want of consideration or possible cause of offence—however small—to one whose regard we esteem so highly.—Junior Editor, British Bee Journal.

[Mr. and Mrs. Cowan are now in California. Would it not be well if our Ontario or other societies would make an effort to have them attend some of our conventions. The members of the Brant, Oxford, Norfolk, and Haldimand, I am sure would be pleased to have a Union meeting for the occasion. Let something be done at once. I believe Mr. and Mrs. Cowan will return to England this summer Mr. Cowan is a gentleman whose wide range of knowledge on apicultural subjects, his travels in different parts of Europe, Africa and America would enable him to give us a great deal of interesting and useful information. Mr. Cowan is known to many of us as the author of that beautiful work “The Honey Bee,” a scientific work of great interest and value. What do bee-keepers say? Let us act at once.—ED.]

## Bee-Keeping as a Business.

C. C. MILLER.

On page 180, C. H. Dibbern uses a number of interrogation points, among other things, asking if I ever knew “a farmer who did not get all he could for his honey?” I don’t know that I did, and what’s more, I’m not sure that I ever knew anything about what farmers got for their honey, if, indeed, I ever knew a case where a farmer offered honey for sale. Please, Bro. Dibbern, that was no original proposition of mine, but a tradition handed down by a long line, perhaps more properly a thick line, of witnesses. But as I understand the tradition, it doesn’t matter a bawbee if it should be fully established that every farmer from Cain down, always got the last cent he could for his honey. The point is that his honey isn’t worth a price proper for a good article, but there is such a general feeling that honey is honey, that when a farmer sells a dirty mess at five cents, that does does a great deal towards establishing five cents as a proper price for everything that comes under the name of honey. Now mind you, I don’t say that’s true, I am only trying to instruct you in the tradition. I never had any practical experience in the matter.

You ask whether we are not a little narrow when we preach that only specialists should keep bees. I’ll answer that question with “yes,” if you’ll change that “we” into the “they.” For I’m not preaching that doctrine, neither are you, in fact, if I remember rightly, I advocated the idea that whatever would be the greatest good for the greatest number would be the desirable thing to establish, and that probably it might be best for every farmer to be sufficiently informed to keep bees.

Now I’ve mentioned some of the things that I haven’t said, and it may be well perhaps for me to refer to what I have said to which exception has been taken. I believe a man has the same right to keep bees that he has to keep hogs or hens or to raise wheat. But I don’t believe that I have a right to raise wheat on Bro. Dibbern’s land without his permission. Not a whit more do I believe I have a right without his permission to plant an apiary of a hundred colonies within ten rods of him, no matter on whose land it is, when he already has there an apiary that fully stocks the field. If I do, I damage his



business to such an extent that it may not be profitable for him to continue longer in that place. It doesn't matter that it would be against my own interest so to do, I am merely considering his case. He may cultivate his wheat field in perfect assurance that I will not interfere with his crop, but after he has been to some trouble and expense to complete his plant to produce honey, he has no assurance that I or some one else may not encroach upon him.

Now what I believe is that the element of uncertainty as to holding a field should no more come in with regard to producing honey than wheat. I think all fair-minded men agree that Bro. Dibbern has a moral right to the field he has already occupied. No one, I think, has said a word to the contrary. But I think his moral right should in some way be made secure by some sort of legal right, and for holding this view and expressing it some years ago I brought down wrath my head. I was selfish and harsh. I shut my mouth, but I never changed my mind. Possibly I'm unwise to open my mouth now, for the time may not yet have come. But if the production of honey is ever to become profitable enough to be regularly followed, I believe there will come a time when a man will be just as safe from interruption in producing honey as in raising wheat.

Marengo, Ill., March 1st, 1898.

## QUESTION—AND ANSWER.

**Having only a limited amount of room how far apart can I place my hives. Should I put them equal distances apart and in regular rows?**

Except for your own comfort in moving among them and handling, I don't know that the order or position of the hives means so very much. Regular rows is the simplest form; placing them in pairs side by side, allowing comfortable walking space between each pair. Have the entrance of each row of hives facing the entrance of the next with a highway for the bees between, let it be at least wide enough for a lawn mower. This arrangement will leave your rows back to back. Suit yourself with the width of the alleyway or passage between the rows of backs. You want it for your own accommodation, thus carrying and hauling hives, etc., without interfering with the flight of the bees.

Brantford, Ont.

W. J. CRAIG.

I prefer to have them three feet in the row, this allows space between the hives to stand while operating. But if your ground is limited you can put two hives close and allow standing space between each pair. I prefer six feet between rows, but that may be lessened.

A. D. ALLAN.

Put them in pairs in rows. Rows six feet apart and pairs four feet apart.

J. PIRIE.

I set my hives six feet from centre to centre. Thus . . . . . The hives can be set closer together if scarcity of room demands it, but I want my apiary so arranged that a hand cart or a wheelbarrow can pass anywhere through it.

G. W. DEMAREL.

Christiansburg, Ky., U.S.A.

I have been successful in spacing hives only 18 inches apart, I should advise however, facing them in different directions. You may then put them in regular rows facing them differently as you may choose or seems best, but I should not want the hives less than say 14 or 16 inches apart. By facing them in different ways, there will be no chance of bees getting into the wrong hives. Even if they are spaced nearer than is above mentioned. In any case you want them spaced far enough apart so that you can work handily among them.

J. E. POXB.

North Attleboro, Mass.

A good plan for an apiary where space is limited, is to place the hives in four, two facing east and two facing west, each two about six inches apart and each lot of four six or seven feet apart. We prefer this plan to placing them singly in rows and with our system of wintering, they are packed in cases that hold four hives and are always in the same position.

St. Thomas, Ont.

R. H. SMITH.

Place them in hexagonal circles on stands holding three hives each, having all of the hives facing towards the centre. Place the stands two feet apart in the circle and circles four feet apart each way. Another good plan is to make zig zag rows with stands holding three hives. Thus: . . . . . Place stands two feet apart in rows and the rows eight feet apart.

R. A. MARRISON.

Not necessary to place hives equal distance apart. Hives may be placed close together with good results as far as the working of the bees are concerned. But it is more

convenient for the bee-keeper to place them say 4 feet apart in the rows and the rows 8 feet apart. W. SCOTT.

I like the plan of grouping by fours, with entrances outward and room enough between to stand and work. Groups six to eight feet apart each way.

EUGENE SECOR.

Just as far as you can. Do as your taste and surroundings would indicate, but in swarming time, with queens wing clipped I prefer to have them six or eight feet apart, and have had queens crawl to an adjoining colony ten feet away from the swarming colony. DR. A. B. MASON.

### The Plain Section.

To the Editor :

DEAR SIR,—I hope that you will not think it too much of a sameness to answer my letter, knowing you get so many letters of enquiry. Before ordering a supply of sections, etc., from the Goold, Shapley & Muir Co., I wish you would give me your opinion of the new kind of section (straight), and the size of the same as to width, and the square sides also; and if it is necessary to use a different kind of separator. Have you tried the 5x3½ section, 4 pieces, old style, 7 to the foot? If so, let me hear from that also.

Do the Goold-Shapley Co. manufacture the above kind of section cases and separators. If you remember, when at Mr. Byers meeting, when outside wintering was under discussion, I said that I did not believe a strong swarm was ever frozen to death. I am more decidedly of the opinion from what I saw this winter. One of my swarms is and always has been fully alive all winter, with the exception of one morning when the thermometer was about 20° below zero. They are always working about the entrance, carrying out any dead bees, even when down to zero. At first, when I found the bees so restless, I felt sure something was wrong with them, and that they would be sure to get the dysentery or eat so much honey they would starve, but up to the present time they are in first-class condition. I took off the cushion a few days ago, when I found all the frames (10) with bees on, smart and clean, in fact so much so, I put the cover down quick. So far my bees are in good shape. I expect to lose some, of course. This is too early a date to be able to know in what shape the bees will get through. Let me know how soon the G., S. & Muir Co. manufac-

ture wax into foundation, so that I may be able to get both supplies and foundation at one shipment.

Yours truly,

Feb. 21st, 1898.

J. F. D.

REPLY.

I think that the plain section is a decided humbug. Mr. Alpaugh was here, and I gave him my views and the reasons, and he went home fully convinced that there was nothing in it. If you make the bottom bar as wide as the side bar should be, there is not enough room for the bees to properly enter, and if you make the side bar as narrow as the bottom bar should be, it is not wide enough. Mr. Pettit is of exactly the same view. Those who are practical bee-keepers, should not be so easily led astray. Now, as to that new size section. For goodness sake do not let us get any more off sizes; we have just gotten rid of the 3½ x 44. The section does look a little better the other way, but the question is, is there any money in it? The deeper the sheet of wax in the section, the greater the tendency to sag. We are turning out our new sections this year in one piece, with the top and bottom bar cut clean away in the corners. That is where the difference in filling lies. Look at Hutchinson's front cut in the "Review." When you examine it closely you will see that in the sample of plain section the corners are not close, but in the other the cut out is not nearly so great in the top and bottom bar. That is where the difference comes in. The idea that the bees pay any attention to whether the wood is in the side of the section or against the fence, is on the face of it absurd. The Goold, Shapley & Muir Co., Limited, will make the plain section for any one who wants it. The G., S. & M. Co., Limited, are making comb foundation and bee supplies right along, although they are crowded with orders at the present time and working overtime. When Mr. Alpaugh was here a week ago, I pointed out to him, from a specimen, that when a section is well filled, the bees attach the comb far enough out to the sides to strike the proposed fence, and in many cases the comb would be broken.

Yours very truly,

R. F. HOLTERMANN.

# Eighteenth Annual Meeting

## OF THE ONTARIO BEE-KEEPERS' ASSOCIATION.



Continued.

Mr. Frith—My experience about this is, as far as my experiments have gone in regard to the deposit of pollen, it depends a good deal upon the position of the feeding brood, that is the brood that has just hatched out and are being fed. If the position of this brood were close to the sections they are almost sure to deposit pollen there. If the broods under the sections are sealed over they are not so apt to do it but, if those cells directly under the sections, or under any of the sections, are empty and eggs are deposited in them and the brood hatches out and have to be fed you will find pollen there, or as close to them as they could get. We find the pollen is put as close to the feeding brood as possible.

Mr. Holtermann—Those days of the light flow are the days in which the bees will bring in pollen.

Mr. Gemmell—There is a difference between Mr. Frith and Mr. Hall. Mr. Hall wants the brood as close to the top as possible.

Mr. Hall—The difference must be in the season or locality.

Mr. Frith—His experience might be just the same after all. If the honey flow comes on a little later or is delayed a few days the brood will hatch out and the cells be refilled, with a good queen, with eggs; these will hatch out in a few days and have to be fed and then they will deposit the pollen. If the honey flow comes on before the brood hatches out next to the sections, my experience is, that you will have very little pollen in the supers.

Mr. F. Ortt—I would like to ask the question if the no bee way space is likely to come into general use in Canada?

Mr. Gemmell—We want the honey to come within 1/16th of the wood all the way around; they ought to have ventering for two reasons; we want this venter there so that when the retailer sticks his finger in to pull the section out he will not get his fingers into the honey. I am not here to advocate the thing, nor to build up anybody's business.

Mr. Holtermann—Anybody can make them.

Mr. Hall—When we commenced taking comb honey first, we had no bee space in our sections and we had no separators between our sections. We had no comb foundation to put in them and we used to get some fat sections and some lean sections, and the fat ones looked very nice; everyone wanted a fat section, and when we crated them and supplied them to the retailer that was where the difficulty largely came in, which will come in with these new sections. We, as bee-keepers can handle them without making them bleed, but we put them into the hands of the store-keeper who does not know anything about bees, and who handles a package of honey as he would a package of coffee, and they make them bleed. I found with no separators, although I think it is nicer myself, it gave a good deal of trouble to those I sold it to, and when I went to sell it to them they said, I don't want to touch the stuff, it dirties up everyone, and I wouldn't have it around. What are you to do in this case. We have got to guard against that, and that is why we have separators so that our honey stands back from the wood, and when you pull out one from the other there is 5/16 of an inch between the surface of the comb and the surface of the other, and that assists these very clumsy or ignorant people who do not care about bursting the cells of the comb, in keeping it clean, and it looks very pretty to the purchaser, and I hope it will not be a very great annoyance to him in handling it. He says, "I don't want to handle the dirty stuff, I keep a clean establishment here."

Mr. Gemmell—You spoke about the section and the space at the sides of the section. The honey in the top bar will just be the same in this new section as in the old. You understand, on the top bar of the section they draw out the honey so far.

Mr. Hall—I like them to come out a little further so that they cannot pick them up that way.

Mr. Gemmell—This top bar in the pre-

sent section we are using is drawn out a certain distance, and in the new section it will be drawn out just the same, so that when you go to pull out a section you take hold of the top part of the section, as a rule, those sections with a piece on the top, that is all the same width, the four piece section or the one piece section. If you have a section with a plain top bar, I do not see what difference there is going to be in taking hold of the top bar of that section and the new one.

Mr. Hall—Is it the face of the section? The section will look prettier. Don't make the change too fast; go cautiously.

Mr. Holtermann—I believe Mr. Hall is right. I was over on the other side and was talking with an old supply dealer and we had a long talk over the matter. It is simply nonsense to say that you can produce any better article without the bee space than you can with it; you simply cannot do it. There is a difficulty in connection with an untutored person handling that honey. I venture to predict this, and if there is any permanent change in that direction, it will be in the direction of having that on one side only. I can say that it might be within the practicable to have on one side the bee space and none on the other, but when it comes to having it on either side, I venture to predict there will be a failure. We want to be careful; it is all right to make changes judiciously and to go along at a certain pace, but I believe there is a danger of us, to a great extent, going too fast, and we want to be very cautious about that. Some think it is going to cost less to put that honey upon the market. As far as the cost of the section is concerned, the work is the largest part of the cost of the section. Now, do you know that the marketable demands at the present time are twelve-section crates, and if you want to be able to put sixteen sections on, you cut a little off the width of that crate and the difference of the cost there is not going to be worth talking about. So I am inclined to think we want to be very careful.

Mr. Gemmell—I am opposed to any radical change in anything; at the same time I am going to try the new section. I am not going to put twelve sections in; I am going to put four sections more in the same crate, and I am going to sell it. I do not advise anyone to go into it wholesale. I have followed this thing for several years myself, not personally, but I know of other parties, and they have never advocated it very strongly. I have always had the idea that a perforated separator with cleats on it and no space in the sec-

tion, would produce a nicer looking article.

The President—Another question which has been handed to me is: "What is the best and quickest way to make honey vinegar?"

Mr. Hall If you are going to make it for fun, it is all right; but if you are going to make it for profit, you had better quit; it will cost more than it is worth.

Mr. Holtermann—This question is limited to the best and quickest way of converting it into honey vinegar. I might say that last year I advocated to a greater extent the production of honey vinegar, and as a result of that, the Brantford Starch Works, which are a very extensive and responsible concern at Brantford, thought they would go into the manufacture of honey vinegar. They came to me and asked me for suggestions. I gave them what suggestions I could, but my knowledge was limited upon that subject, and they have been investigating along this line. Now, the question is, the best and quickest way and I shall try and stick to the point. They say that the best and quickest way of producing honey vinegar is not by the method we usually pursue, that of the slow process of mother the plan of taking the oxygen from the atmosphere and rusting it as it were, or adding to it saccharine matter, but by means of alcohol, and in order to do that you have to deal with the Inland Revenue Department. I think they will go extensively into that business but it has got to be done with the assistance of alcohol, as other vinegars, and through the Inland Revenue Department.

Mr. Sparling—Some gentleman in the American Bee Journal years ago spoke of making honey vinegar by the addition of alcohol. It was some Doctor, I do not remember his name now.

Mr. Hall—Honey vinegar is the best you can get, but it does not pay to make it.

Mr. Smith—There is another question I would like to ask; that is, in the event of changing this style of the comb honey super, or adopting a new one, what is the best style to adopt, either the T rests or section holders or any other style?

Mr. Newton I might say I am changing a little bit and I am going to try the super that Mr. Hall has lately been using. I have got a little tired of the big super; I am using T rests.

Mr. Frith—I think years ago we took this up and it was intimated that we make a reversible, not invertible super; Mr. Hall has one and he uses it largely. Let us hear from him.

Mr. Hall—These gentleman are very fond of speaking of what Hall does. Allow me to tell you that they don't know what they are talking about. As far as the reversible or invertible or interchangeable is concerned, I have had one hundred and fifty of them for twelve years, and I don't handle them, and I don't interchange the sections from the outside to the end. I don't use those first class qualities that the super possess, but I use a super that I like better than that, the one that Mr. Newton was telling you about just now, a super that holds but twelve sections and is reversible simply from end to end of the hive. I like them so well that I have given an order for three hundred more of them. Most of you have seen the super.

Mr. McEvoy—Please explain it.

Mr. Hall—(Using some sheets of paper to show the shape of a hive). Imagine that is the top of the hive and we have a small super of the size of that hive. We cut the honey board that lies on top of these frames in two, and we make two small honey boards instead of one large one. Last year some one said that I put these little supers on weak colonies of bees. The man that said that did not know me at all; I just do the reverse; I put them unto the strong ones. When I think they are active and willing to go up and the honey is there for them to go up I take off the little lid and put on one of my supers, and cover it up. There is room for twelve sections of honey there. It is not very much exhausted by that addition and if there is any honey coming in from the fields they will commence putting it in a small super. If you have to cover the whole of the hive, taking twenty-four or twenty-eight sections, they would be pretty loathe to leave home and go up in that garret. I find this is my experience, that they commence much sooner in these small supers than they do in large supers and they always commence towards the middle of the hive. When they have making it a sort of crescent shape just over commenced nicely in those little supers, the brood, I then put a second one on and they will continue this circle and make a crescent shape in the other end of the hive. When they have got thoroughly to work in there so that they have got the combs partially filled or some all full of honey, we just take the two supers and the honey is in the centre, and it is all empty around the outside. The honey is in the centre and they put the honey immediately above the brood and all we have to do is to reverse this from end to end and the honey then is at the two ends of the hive, the

middle, right above the brood, is a vacant space and they hurry up to fill it; they do not like a vacuum. By so doing we get our corner all filled and as soon as they want an addition, if you chose, you can give them an addition of twelve sections only, not twenty-four; they do not take the heat of the hive at all; they go to work and we just raise it up and give them twelve more and so on till we get up to perhaps one hundred and fifty sections and we give them a good rest at that. We mark on the end of the supers the date as we put them on so that we know what it is. You will be a little surprised how quickly they seal them over and you can't get them off. You get prize honey and fancy combs. They continue to put the honey right at the top of the hive; they are ready to come off in one half the time that a super the full size of the hive would be, because the corners are finished and the centre is sure to be finished.

Mr. Frith, You do not reverse any but the first two you put on.

Mr. Hall—It is not necessary.

Mr. Smith—Does it make any difference on which end of the hive you put the first super.

Mr. Hall—If the bees live in the parlor put the super there, if they live in the kitchen put the super there. The brood is more or less at one end of the hive; generally speaking, the brood is in the front, but not always. We put the first super over the first brood in the hive, whether it be front or rear.

Mr. Ortt—If you are giving a prime swarm would you give them the twelve sections?

Mr. Hall—Forty-eight to fifty-six.

Mr. Gemmell—You would transfer the sections from the old hive to the swarm?

Mr. Hall—In ninety-nine cases out of a hundred.

Mr. Sparling—Did you ever try paraffine paper on top of the sections?

Mr. Hall—No sir. I have not tried that bee space, but allow me to tell you that I think it is a good thing, but I should have to go to a great deal of trouble in my supers to change them and I can do without it. That bee space with the perforation I think is a good thing but I am not going to use it.

Mr. Gemmell—I have used this divider of Mr. Pettit's, and I found it was a good thing for getting the outside section well filled. You have a double row of bees, so to speak; you have a row of bees outside of this divider and between the outside of the super, and if I had my choice in naming it I would call it a perforated

follower, and I would put one on each side, with a bee space between the outside of the hive and the follower. That gives room for a double row of bees there, when you have a large quantity of bees. There is more or less of heat, and you get those sections filled and sealed just about as quick as you do those in the centre.

In speaking about using separators perforated, if you use them, by all means use the follower as well. If you have a perforated separator, by all means have a perforated follower. I find them a good thing. I use them. There is this about them, they are that much additional furniture to the hive that you must carry over to the next year. I did not change my supers only in this way, that I used twenty-four sections in the super instead of twenty-eight.

Mr. Frith—You experimented.

Mr. Gemm—I took all my comb honey last year by that process.

Mr. Holtermann—With regard to the question of the best super, the object of using the half super is to accommodate weaker colonies; I would object to that.

Mr. Hall—I do not use it for that.

Mr. Holtermann—I understand that some are advocating using it in that way. Here is a point that I do not think has been brought out in bee-keeping very much, and I think if you consider it you will admit that the colony that will do the most propolizing is the weaker colony. If you get an exceedingly strong colony, or a very strong colony able to keep up the temperature and so on, that colony will propolize less, other things being equal, than the weaker colony. I have had no experience with these half supers. When we touch upon the question of the double bee space and divider at the side of the hive, I think it is exceedingly important for those who want to have a finely and well-finished product to have a double bee space and I believe it is an advantage to perforate that. As far as my experiments go, the perforation throughout the inner part of the hive, that is in the separator, I can see no great advantage in it.

Now, another suggestion: a supply dealer, from a business standpoint, is anxious to do as much business as possible and anxious to supply as much material as possible, but I can find no difference in this respect, that if you take metal, which you can buy perforated accurately and exactly, which is perfectly smooth, at less money, it will answer the purpose fully as well as the wooden divider, and all they have to do at the end of the season is to throw it into hot water and add a little lye

to it, and it is just as good one year as another. But if you use the wooden divider and you are anxious to produce a choice article, you practically throw those separators and dividers away every year, and it is difficult to get them quite as nice again. The wooden ones are comparatively expensive and you will find the zinc answers perfectly as well.

Mr. Hall—I do not say the small super is best. I do not say any super or hive is best: I am simply telling you what I am going to use and what I am using.

Mr. Holtermann—It is no longer an experiment with you.

Mr. Hall—I have tried three lots; I have got two hundred and I want three hundred more.

Mr. Heise—Would you advocate using all small supers or sufficient to cover the hives the first time?

Mr. Hall—It is very awkward to use large and small together, but the small are much nicer than the large ones. I do not mix them. I put on my last super onto the end where it is nearest done. It makes no difference about whether they are level on top. If you have large supers and small supers together you would have to have them so that they would be level on top. Have them all of one kind.

Mr. Post—Do you find any trouble in keeping your sun caps on when one side is up higher than the other?

Mr. Hall—You remember I am an old fashioned fellow and I have hives in my possession seventeen years old; yes, I have them twenty-two years of age. We commenced taking comb honey about nineteen years ago in sections. We took it then in two pound sections, six of them together sitting on the honey board with rests on them, and there was a glass at the ends, and we had to have a rim to cover up this glass, and I have those rims yet. Also in the spring when I want to keep them from the cold, I put a big cushion into that lid, and in the summer season I put it forward half an inch and put a cleat on top of the hive, on one edge. That leaves half an inch at the back and half an inch at the front for a current of air to go through, and I never had but one of those hives melt down.

Mr. Post—So, if we change it will necessitate a rim.

Mr. Hall—No sir.

Mr. Post—When one end is built up one would be higher than the other.

Mr. Hall—Just lay the sun cap on and lay a brick on it.

Mr. Smith—I may say I have used those supers this past season. I did not get

them made up in time to use early in the season, but I think possibly they would be of greater advantage earlier in the season. It is a good super. We use a perforated follower and all these features that make it a first-class hive, but I think it is rather too much manipulation for a good swarm. I would rather have a good sized super, but, for putting on early in the season possibly those supers would be just as well.

Mr. Newton—As regards the rim, I am not quite so fortunate as Mr. Hall, to have a lot of rims lying around, and I have worked for the last two seasons without them. I sometimes work them till they come even and sometimes I use the large ones, which he says he does not want. I have some of them and, of course, I am trying to keep down expenses. If they are only one height, I sometimes put another one under the end of it, to level it up and then put on the cap. I have got on the last two seasons without any rims, and I think it can be worked without the aid of them. Mr. Hall is fortunate in having them. I wish I had them.

Mr. Gemmell—I got the idea from Mr. Hall as to those hives. My boy is getting the idea into his head that he is a better bee-keeper than I am. And he says get the small supers out of the way and get the Hedden hive out of the way so that I can get the queens clipped quicker.

Convention adjourned to 8 o'clock p. m.

#### FIRST DAY, EVENING SESSION.

The President, Mr. Darling, called the Convention to order at 8 o'clock p. m.

The Secretary read a number of communications.

Mr. F. A. Gemmell moved, seconded by Mr. J. Newton, that the communications as read, be received and placed on file. Carried.

After some discussion on the question of changing the date on which the annual meeting should be held, Mr. R. F. Holtermann gave notice of motion to amend the by-law, changing the date at which the report of affiliated societies should be sent in, to the 15th of November, instead of, as at present, the 1st of December.

Address by Prof. Shutt, of the Experimental Farm, Ottawa, on the subject of "Foundations."

Mr. President and Gentlemen:—

It affords me the greatest pleasure to be with you. I assure you it was with much diffidence that I accepted the invitation of your president to address

this convention; not for want of sympathy or for lack of interest, but, as I acknowledged this afternoon, from my ignorance of any practical knowledge of your work. I have had no experience in practical bee-keeping. Nevertheless, I am not too old yet to learn, and by virtue of my office as chemist at the Experimental Farm, I am naturally interested in every branch of agriculture, and you will all admit that bee-keeping is one of not the least important branches of that industry. I am very pleased to devote my energies, as far as time permits me, to the solution of problems in all branches of agriculture that require chemistry for their solution. We have in the past done some work for those who are following the industry of bee-keeping in Canada, and it is with regard to those experiments, and the results obtained therefrom, that I purpose addressing you briefly this evening.

These investigations were carried on at the Experimental Farm, in connection with our practical bee-keeping during the years 1894, 1895 and 1896. This year has been such an exceptionally poor year for the honey flow that it was impossible to continue the investigations. I may say at the outset that these experiments were suggested by Mr. Holtermann, and, briefly, the object of those investigations was to ascertain the relative values of certain brands of foundation comb that were in the market.

Before I relate to you how I conducted those experiments, and the results obtained, I think it might be well for me just to say a word or two by way of preface as to what wax is, and, secondly, what we aimed at in this work; that is to say, we want to try and arrive at the objects that we had in view in furnishing bees with foundation comb.

Now, first of all, wax, looking at it from a chemical standpoint, is very closely allied to the fats. There are a large number of substances which fall into certain well-known classes; there are waxes, fats, sugars and other things. The chemist, for instance, knows of a great many kinds of sugar; he knows of a great many kinds of fats and these are all more or less related. Without going into any of the technical details with regard to the composition of wax, I wish to say, that although it is not a real fat, yet it is, as it were, a first cousin to it. It consists of carbon, hydrogen and oxygen in certain proportions, and the important point I would like to impress upon you, just here, is, that it does not contain nitrogen; in that regard it is similar to honey. Honey

however, is classed with sugars, wax with fats. Wax is a secretion by the bees. By that I mean to say it is not collected; it is the natural outcome of certain glands, and I must assume that you are aware of the anatomy of the bee; undoubtedly you are. There are seven glands consisting of cells which are set apart for the secretion of wax, therefore, the important deduction from that is this, that it is a normal function on the part of the bee to produce wax. Wax is not gathered or collected from the flower but it is secreted, and then how is it produced? It must be produced by the bees at the expense of the food which the bee eats. That is an important point to recollect. The bees make the wax from the food that they consume; and as a matter of scientific interest and probably of some little practical importance, I may say that very elaborate investigations carried on on the continent of Europe have gone to show that wax is produced from the saccharine matter, more particularly, that the bees eat; that is to say they have power within themselves to convert the saccharine matter they obtain from the nectar into beeswax. It will be of interest for us to just compare that for a moment with the production of honey by the bee. Honey—I am open to correction because I am speaking from what I have heard, we have no Canadian data on the subject—and wax have a similar origin in some respects. I have said that wax is a secretion, the product of certain glands; honey is not exactly that, neither is honey collected; honey is really a secretion, but, at the same time, in a measure, it is indirectly collected by the bee. If you examine the sugar chemically which is contained in the nectar of flowers you will find that it is practically the same as our ordinary cane sugar known as sucrose, but if you examine the sugar which is contained in honey you will find that it has very little of cane sugar or sucrose in it; in very new honey there may be, but in honey which is termed ripe there is but a small per centage of real cane sugar, so that you see the honey bee is not a mere machine for collecting the nectar and giving it to us, but in some way or other due to some physiological functions of the bee, the sugar that it collects is changed. I can very briefly explain to you how we know that. We make a solution of sugar and pass through that sugar solution a ray of polarized light and according to the nature of that sugar so will that ray of polarized light be affected. We find that

the sugar in honey affects the ray of polarized light differently to a solution of cane sugar or sucrose; therefore, it is presumed that the honey bee in collecting the sucrose, after collecting it, has converted it by what is known as a diastase, or ferment, into these two sugars which are known as levulose and dextrose, one element turning the ray of light to the left and the other turning it to the right; levulose turns the ray of polarized light to the left and dextrose turns the ray to the right. So that in some way or other, and it is not at all difficult for us to understand, because we know that our own digestion is carried on by the secretion of certain ferments which are secreted by certain cells. You know that the first act of digestion with us or any other animal takes place in the mouth; when we eat starch that starch is converted by the saliva into a glucose; it is converted from an insoluble form into a soluble form so that it can be assimilated and taken into circulation and thus perform its work. These are important points in connection with the production of honey that it would be well for us to remember because they have very important bearings upon the work, as we shall see later on. I do not purpose however, to speak any further with regard to honey, because my work has been entirely confined to this question of wax. Let me give you just one or two data with regard to beeswax. Beeswax is lighter than water, its specific gravity is .963, taking water as 1; if you take water as 1000 beeswax is .963; its melting point is about 145 degrees Fahrenheit. The reason I mention these two facts first is this, that some years ago some samples of beeswax were submitted to us; they were suspected to be adulterated; we found in the samples various percentages of paraffine; paraffine is paraffine wax; it is not a wax really; it is not related to beeswax at all. Paraffine has a specific gravity of .909, so that you see it is very much lighter than beeswax, and its melting point is 130 Fahrenheit; its melting point is 15 degrees below that of beeswax, and that is how it comes about that much disaster results from the use of beeswax adulterated with paraffine, because our high summer temperatures cause the melting of this adulterated wax.

Now, a word or two with regard to the objects of furnishing our bees with foundation comb, and I expect now I shall be inviting criticism and I shall be very glad to have it. Briefly as I said in 1894, in supplying foundation to the bees the object is to save much of this expenditure,



the expenditure of food in the tissue in the formation of wax and thus allow the bees more time and energy for the production of honey. I admit, also, that the primary object of that investigation into the relative values of certain brands of foundation was to ascertain the relative ease with which bees could utilize these different foundations; that is to say, the relative ease with which they could be drawn out and built into cells; and I argued from that that foundation would be the most profitable to use, that the bees could utilize to the greatest extent in this way. That was my deduction. In other words, those foundations to which the least wax was added by the bees in building comb.

Now, it will be necessary for me to explain somewhat the method of our procedure. A certain number of foundations were submitted to us. I had a stamp or die made exactly two inches square, and stamped out of each of those foundations a piece or several pieces—ten pieces. I took and weighed them, and thus ascertained the average weight of two inches square of several brands of foundation, and then at the close of the season the caps of the cells were carefully removed, the honey was extracted by an extractor, and then they were soaked in water to remove the last traces of honey. They were allowed to dry spontaneously, just by exposure to the atmosphere. In that way

(To be continued.)

---

## THE BEE SUPPLY BUSINESS

**Of the Goold, Shapley & Muir Co.,  
Limited, Brantford,  
Ontario.**

As announced in the supplement to the March number of THE CANADIAN BEE JOURNAL, the factory of the above company was severely damaged by fire on March 4th. The bee supplies were practically destroyed. A considerable portion of the special and accurate machinery used in the manufacture of bee supplies was saved, some of the machines being only slightly damaged. Two questions have prevented the company from coming to a decision before this date

of writing. It is well known that the G. S. & M. Co. are doing the largest wind mill and grinder trade in the Dominion. Their business in this direction, as a result of their enterprise, energy, and the excellence of their goods, has grown very rapidly, and they have felt that in this direction they have a business alone. In the bee supply and wood work business, even if it were capable of the same expansion, should be a business in itself, and the company had some inclination to drop out of this line.

In the next place the company had an offer from another municipality to induce them to locate there, which practically meant giving the G., S. & M. Co. \$26,000.

The numerous letters from old customers showing their anxiety that the company should continue to supply them with goods, and in many cases coupled with kind and sympathetic words, and the promises from others of more business than ever, has helped the company to decide to continue in the bee supply business.

The offer of the city of Brantford to put in proper shape the large factory, built and occupied for many years by the successful firm of J. O. Wisner, Son & Co., in which Mr. E. L. Goold had a third interest, and with which Messrs. John Muir, Vice-President of the G. S. & M. Co., and Mr. Henry Yeigh, Secretary-Treasurer of the company, were intimately connected, decided them to stay in Brantford.

The company are beginning at once to manufacture a full line of bee-keepers' supplies, and if necessary they will work day and night until orders are filled, and no one need fear that goods will not be forwarded promptly. All orders will be filled in plenty of time for the honey season. The company, of course, take it for granted that the bee-keepers will not delay ordering until the last moment.

The clover and everything else at present gives promise of a good bee season.

Editor.

**THE  
CANADIAN BEE JOURNAL**

*Devoted to the Interests of Bee-Keepers,  
Published Monthly by*

**GOOLD, SHAPLEY & MUIR CO.  
(LIMITED)  
BRANTFORD, CANADA.**

**R. F. HOLTERMANN, EDITOR.**

**TERMS:**

\$1.00 per annum, payable in advance; \$1.25 if three months, or \$1.50 if six months or more in arrears. These terms apply to Canada, the United States and Mexico; to all other countries 24 cents per annum extra for postage.

**TERMS TO AGENTS**—We will allow 20c. commission to agents or those already subscribers for one new subscription; 25c. each if two or more, or 30c. each if ten or more new subscribers. Cash must accompany subscriptions and they must be for one year.

**DISCONTINUANCES**—The JOURNAL is sent until orders are received for its discontinuance. We give notice when the subscription expires. Any subscriber whose subscription has expired, wishing his JOURNAL discontinued, will please drop us a card at once, otherwise we shall assume that he wishes his JOURNAL continued, and will remit soon. If you want your JOURNAL discontinued at the end of the time paid for, say so in ordering and your wishes will be carried out.

**RECEIPTS FOR MONEY**—The receipt of THE JOURNAL will be an acknowledgment of receipt of money to new subscribers. The receipt of renewal subscriptions will be acknowledged by postal card.

**HOW TO SEND MONEY**—You can send money at our risk by P. O. order, or bank check or draft, and where none of these means are available bills and postage stamps by registered letter. Money sent in any other way is at your risk. We pay no exchange or express charges on money. Make all express money orders, checks, or drafts payable to **Goold, Shapley & Muir Company, (Limited), Brantford.**

**ADVERTISING.**

We are in no way responsible for losses that may occur in dealing with our advertisers, yet we take every precaution to admit only reliable men in our columns.

**RATES OF ADVERTISING—**

| TIME      | 1 inch  | 2 in.   | 3 in.   | 4 in.   | 1 col.  | page    |
|-----------|---------|---------|---------|---------|---------|---------|
| 1 Month   | \$ 2 00 | \$ 3 00 | \$ 3 50 | \$ 4 50 | \$ 6 50 | \$10 00 |
| 2 Months  | 3 00    | 4 50    | 5 50    | 6 50    | 11 00   | 17 00   |
| 3 Months  | 4 00    | 5 50    | 7 00    | 9 00    | 15 00   | 25 00   |
| 6 Months  | 6 00    | 9 00    | 12 00   | 15 00   | 25 00   | 40 00   |
| 12 Months | 10 00   | 15 00   | 20 00   | 25 00   | 40 00   | 75 00   |

**CLUBBING LIST.**

We will send CANADIAN BEE JOURNAL with

|   |        |
|---|--------|
| The American Bee Journal, \$1.00 for.....   | \$1 75 |
| The American Bee-Keeper, 50 cents for ..... | 1 40   |
| Gleanings in Bee Culture, \$1.00.....       | 1 75   |
| British Bee Journal, \$1.50 .....           | 2 00   |
| Illustrated Home Journal.....               | 1 35   |
| Weekly Witness.....                         | 1 60   |

**READ THIS**

**WANTED** A man who desires to fill a steady, paying position and earn good wages! If you are at present employed, that need not prevent you from sending us a postal card to learn what we can do for you. We have the largest, most complete and thoroughly up-to-date nurseries in the Dominion. There is a largely increasing demand for **HOME GROWN NURSERY STOCK.**

**All Supplies Sent Free; The Trial Costs You Nothing; You Get Your Pay Every Saturday.**

If you cannot give full time to our interests we can arrange liberal terms with you for part time. We grow a full line of Fruit Trees, Berry Bushes, Flowering Shrubs, Ornamental Trees, Hedging, Bulbs, Roses and Seed Potatoes. All our stock guaranteed and warranted to live.

Write and tell us you are open for an offer, and we will make you a proposition you will want to accept.

**E. P. BLACKFORD & CO.  
TORONTO, ONT.**

**BEE-KEEPING.**

One wishing to become a practical apiarist, apply to

**J. B. HALL,  
Box 498, Woodstock.**

**Large Apicultural Establishment**

Established in 1860

For the Rearing and Export of Queen Bees, Pure Selected Italian Kind.

CAV. PROF. PIETRO PILATI, VIA Mazzini No. 70, GENOA (Italy).

Price List, March, April, May: 1 Tested Queen, \$1.75; 6, \$9.25; 12, \$18. June, July, August: \$1.25, \$7, \$14. September, October, November: \$1, \$5.75, \$10.

Orders must be prepaid and accompanied by Post Office Money Orders. Please state names, addresses and railway stations in a legible manner. Should a Queen Bee die during the journey, the same must be returned, accompanied by a post certificate, and another Queen will be sent immediately instead.

....A PERFECT GRAIN GRINDER....

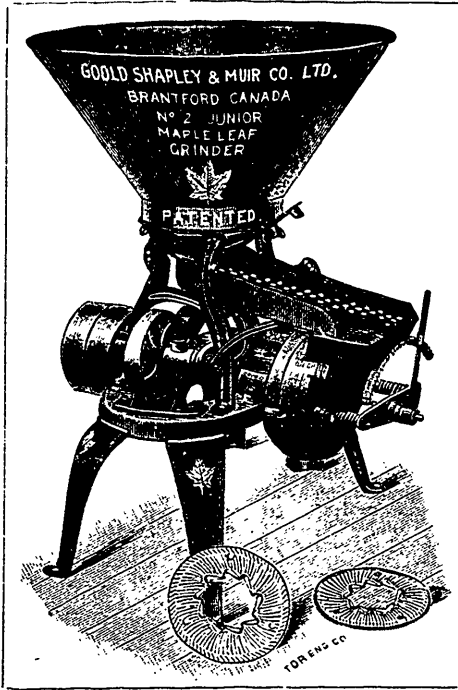
The Patent Ball-Bearing

# Junior Maple Leaf Grinder

WITH 8-INCH SINGLE BURRS.

MANY IN USE AND WORKING SUCCESSFULLY

The Junior Maple Leaf is especially adapted for Wind Mill, Horse or Tread Power, or any other power less than 8 or 10 horse.



It is supplied with two sets of Grinding Burrs, one for coarse grain and general purposes, and the other for hard grain and fine work.

The Patent Ball-Bearing takes the heavy back pressure of the burrs when at work, and greatly lessens the friction. In consequence the Grinder will do more with a given power than any other.

We Will Give Any Responsible Party a Fair Trial.

**We Absolutely Guarantee  
the Grinder. Send for Prices.**

We also make the famous No. 1 Maple Leaf Grinder with 10-inch burrs.

**GOLD  
SHAPLEY  
& MUIR  
GO. LIMITED  
BRANTFORD CAN.**

# Bee-Keepers' Supplies



## The Hardest Way Possible

To get along is to buy "real cheap" things. As a rule, the less you pay, the more it costs in the long run. We don't boast too much of "cheap" prices, and still we spare no pains to have our goods of best

Material, Workmanship and Design.

With our appliances honey can be taken of the best quality, and with the least trouble and labor. Give us a trial.

Address :

**Goold, Shapley & Muir Co., Limited.**

**BRANTFORD, CANADA.**

Ripans Tabules.  
 Ripans Tabules cure nausea.  
 Ripans Tabules: at druggists.  
 Ripans Tabules cure dizziness.  
 Ripans Tabules cure headache.  
 Ripans Tabules cure flatulence.  
 Ripans Tabules cure dyspepsia.  
 Ripans Tal ules assist digestion.  
 Ripans Tabules cure bad breath.  
 Ripans Tabules cure billousness.  
 Ripans Tabules: one gives relief.  
 Ripans Tabules cure indigestion.  
 Ripans Tabules cure torpid liver.  
 Ripans Tabules: gentle cathartic.  
 Ripans Tabules cure constipation.  
 Ripans Tabules: for sour stomach.  
 Ripans Tabules: pleasant laxative.  
 Ripans Tabules cure liver troubles.

## The Winnipeg Heaters



Are attachable to all kinds of Stoves, Grates, Furnaces and Gas Burners. Detachable and easy to clean. They give as much heat as the burner to which they are attached, and reduce the fuel one-third. Excellent with wood fires. Do not obstruct the draft. Take the cold air from the floor, heats it, and returns it to the floor warm. Stop cold drafts

of a staircase. When ordering by mail give size of stove pipes used. Live agents wanted to sell. For particulars address,

The Winnipeg Heating Co., Limited,  
 2 Adelaide St. East,  
 Toronto.

Brantford: Thos. Glasse,  
 39 Palmeston Ave.

50 YEARS'  
 EXPERIENCE

# PATENTS

TRADE MARKS  
 DESIGNS  
 COPYRIGHTS & C.

Anyone sending a sketch and description may quickly ascertain our opinion free whether an invention is probably patentable. Communications strictly confidential. Handbook on Patents sent free. Oldest agency for securing patents. Patents taken through Munn & Co. receive special notice, without charge, in the

## Scientific American.

A handsomely illustrated weekly. Largest circulation of any scientific journal. Terms, \$3 a year; four months, \$1. Sold by all newsdealers.

**MUNN & Co.** 361 Broadway, New York  
 Branch Office, 625 F St., Washington, D. C.



## THE DIETZ DRIVING LAMP

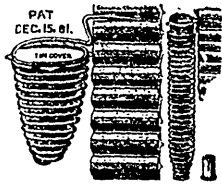
Is about as near perfection as 50 years of Lamp-Making can attain to. It burns kerosene, and gives a powerful, clear white light, and will neither blow nor jar out. When out driving with it the darkness easily keeps about two hundred feet ahead of your smartest horse. When you want the very best Driving Lamp to be had, ask your dealer for the "Dietz."

We issue a special Catalogue of this Lamp, and, if you ever prow around after night-fall, it will interest you. 'Tis mailed free.

**R. E. DIETZ CO.,**  
 60 Lighthouse St., New York.

Established in 1840.

**CONTROL YOUR SWARMS, RE-QUEEN.**

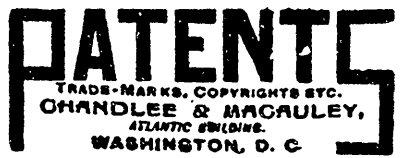


Send 25c. for samples of West's Patent Spiral Wire Queen Cell Protectors, and Patent Spiral Queen Hatching and Introducing Cage; also best Bee-Escape, with circular explaining. Twelve Cell Protectors, 60c.; 100, \$3; Twelve Cages, \$1; 100, \$5, by mail. Circular

free. Address N. D. West, Middleburgh, Scho. Co., N. Y. Sold also by all the leading supply dealers.

AGENTS:

**COOLD, SHAPLEY & MUIR CO., Limited.**  
BRANTFORD, ONT.



**YOUR**

Poultry may be neglected, that is your fault and your loss. Your

**GRANDMOTHER'S**

ideas will not suit modern methods, however good those ideas might have been, they are

**OLD**

now, and out of date. Everything connected with poultry is fully explained in THE CANADIAN POULTRY REVIEW, Toronto, a large monthly magazine, sent at \$1 per year, or to two new subscribers at \$1.50. A free sample copy will be sent our readers on addressing a postal card to the publisher, H. B. DONOVAN. THE REVIEW is nearing its nineteenth year. Get rid of your old

**ROOSTER**

and buy a young thoroughbred to grade up your flock.

**Large Apiculture Establishment**

Established 1862.

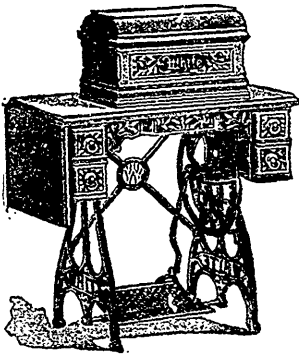
Silver Medal (First Prize) at the Paris Universal Exhibition, 1878. Bronze Medal and Diploma at the Weissenburg Exhibition, 1893. Silver Medal and Diploma at the Strasburg Exhibition, 1895. For the rearing and export of Bee-Queens. Pure select Italian kind.

CAV. PROF. PIETRO PILATI,  
Via Mazzini No. 70,

Price List on application. Bologna, Italy.

**DON'T SACRIFICE . . .**

Future Comfort for present seeming Economy, but BUY the Sewing Machine with an established reputation that guarantees you long and satisfactory service:



The **WHITE.**

ITS BEAUTIFULLY FIGURED WOODWORK,  
DURABLE CONSTRUCTION,  
FINE MECHANICAL ADJUSTMENT,

coupled with the Finest Set of Steel Attachments, makes it the

**MOST DESIRABLE MACHINE IN THE MARKET.**

Dealers Wanted where we are not represented.

**White Sewing Machine Co.,**

Send for our beautiful half-to.1e catalogue. CLEVELAND, OHIO.

FOR SALE BY S. G. READ, BRANTFORD

# A, B, C of Bee Culture

practical, comprehensive, up to the times, and its rapid sales have warranted us in revising it every 1 1/2 years. Over 50,000 COPIES have been sold, and we expect to sell many more.

has by far the largest sale of any Bee Book on earth. It contains over 400 pages and 300 illustrations. It is plain, is an Illustrated Semi-Monthly of 36 pages, \$1 per year. A. B. C. and Gleanings clubbed for \$2.

# Gleanings in Bee Culture

N. B.—Sample of Gleanings free.

A. I. ROOT CO., Medina, Ohio.

## ONTARIO BEE-KEEPERS' ASSOCIATION

ORGANIZED 1880. INCORPORATED MARCH, 1886

### OFFICERS FOR 1898.

PRESIDENT—M. B. Holmes, Athens.  
VICE-PRESIDENT—W. J. Brown, Chard.  
2ND VICE-PRESIDENT—J. D. Evans, Islington.  
SECRETARY—Wm. Couse, Streetsville.

### DIRECTORS.

- District No. 1—W. J. Brown, Chard.
- District No. 2—J. K. Darling, Almonte.
- District No. 3—M. B. Holmes, Athens.
- District No. 4—C. W. Post, Trenton.
- District No. 5—J. W. Sparling, Bowmanville.
- District No. 6—J. D. Evans, Islington.
- District No. 7—A. Pickett, Nassagaweya.
- District No. 8—Jas. Armstrong, Cheapside.
- District No. 9—John Newton, Thamesford.
- District No. 10—F. A. Gemmell, Stratford.
- District No. 11—W. A. Chrysler, Chatham.
- District No. 12—G. Wood, Nottawa.
- O. A. C.—R. F. Holtermann.

AUDITORS—Mr. Hoshal, Beamsville, and Mr. Alpaugh, Galt.

FOUL BROOD INSP.—Wm. McEvoy, Woodburn.  
ASST. " " F. A. Gemmell, Stratford.

Representative at Industrial Exhibition, Toronto: A. Pickett, Nassagaweya.

At Western Fair, London: R. H. Smith, St. Thomas.

Representative at Central Exhibition, Ottawa, J. K. Darling, Almonte.

Place of Meeting, 1898—Guelph.

## UNITED STATES BEE-KEEPERS' UNION.

### OFFICERS FOR 1898.


PRES.....Geo. W. York, Chicago, Ill., U. S.  
VICE-PRES.....W. Z. Hutchinson, Flint, Mich., U. S.  
SECRETARY—DR. A. B. Mason....Toledo, Ohio, U. S.

# PATENTS PROMPTLY SECURED

Send a stamp for our beautiful book "How to get a Patent", "What profitable to invent," and "Prizes on Patents." Advice free, fees moderate  
**MARION & MARION, EXPERTS,**  
Temple Building, 185 St. James St. Montreal.  
The only firm of Graduate Engineers in the Dominion transacting patent business exclusively

R-I-P-A-N-S

The modern standard Family Medicine: Cures the common every-day ills of humanity.



ONE GIVES RELIEF.

## Foundation Machine, etc., For Sale, New Root Rolls.

Also Dipping Tank, double; Wilson Hand Bone Mill, and Ross Ensilage Cutter. All in good order. Cheap.

H. F. HUNT, Mastai, Que.

# MISSOURI AND ARKANSAS

If you want to hear everything about the SOUTH, enclose a silver quarter in a common letter for one year's subscription to the Missouri

and Arkansas Farmer and Fruitman. It tells you where to get cheap farming, fruit, grazing and timbered lands; where to go to fish, hunt and for health; about new towns, new railroads, and where to make paying investments. The largest and handsomest HOMESEKER'S paper in the United States.

Address: R. J. PROFITT, Publisher,  
Kansas City, Mo.