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# CANADIAN BEE JOURNAL

PUBLISHED MONTHLY.

NEW SERIES  
VOL. VI, No. 2.

BRANTFORD, ONT., AUG., 1897.

WHOLE No.  
390

This is the time of year that the usual number of irresponsible parties marshall to the front offering to

**Sell Honey.** buy honey at tempt-  
**Do Not** ing prices. Be care-  
**Throw It Away.** ful to whom you sell.  
See that they have  
efficient financial backing to be able  
to pay for what they get. If they cannot do  
this, go slow about selling to them.

\* \* \*

The Toronto Industrial Exhibition at Toronto, the Central Canadian Exhibition at Ottawa, and the Western Exhibitions. The Western Fair at London are fast leading almost all

others to such an extent that unless there is a change in progress it is only a question of time when many fairs will be out of existence. The Toronto Exhibition will be held August 30th to September 11th. The place of honey exhibit has not yet been decided. It may be as last year, under the grand stand or in the "Little World" building, near the western entrance of the exhibition grounds. Those desiring to show better ask Mr. H. J. [Name], secretary and manager of the Fair. The Central Canadian Exhibition, September 7th to 25th is well worth attending. Apiarian exhibits receive every arrangement. We should like to see a large number of exhibits. Entries should be sent to the secretary, E. McMahon, Brantford, Ont. The Western Fair, September 18th is more than holding its own. The prize list is well laid out, and beekeepers would doubtless be repaid

by exhibiting and attending the Fair. Capt. Thos. A. Browne, London, is the secretary.

\* \* \*

The honey crop this year will likely be good, although some districts are short.

**The Honey Crop.** There is not likely to be much change in price, although the apple crop will be considerably lighter than last year. The Gould, Shapley & Muir Co. began the season with an unusually large stock of bees. The bees were kept in three apiaries, and the company are estimating a crop of over 6,000 lbs. of comb honey alone.

\* \* \*

The United States Bee-Keepers' Union will meet at Buffalo, N. Y., Tuesday, Wednesday and Thursday, August 24th,

**The United States Bee-Keepers' Union.** 25th and 26th. Mr. O. L. Hershiser, of Buffalo, is making the local arrangements. He has secured

Caton's Business Union College, corner Main and Huron streets, place of meeting. Hotel arrangements and programme are announced in another column of the Canadian Bee Journal. There should be a good turnout of Canadians. Membership fees may be sent to the secretary, Dr. A. B. Mason, Station B Toledo, Ohio.

The Judge—Didn't I tell you the last time that you were here that I wanted to see your face in this court no more.

Weary Watkins—You did, yeronner, and that is exactly what tole the cop.

## Notes for Beginners.

R. F. HOLTERMANN.

It would, perhaps, be a difficult matter to find a season more confusing to a beginner in bee-keeping. Bees have acted contrary to all the well known and commonly laid down principles. To begin with the swarming season. A pretty safe rule has been to instruct the beginner to give super room as soon as the bees were sufficiently crowded to build fresh comb along the top bar of the hive. This year the bees swarmed when they had plenty of room for storing honey in the brood chamber, the outer combs on the sides next to the hive wall having little if anything in them. Swarming has been excessive, and at this date of writing, if thistle and basswood yields well, the bees in our apiaries will very likely swarm again. The clover flow has lasted long and continued almost until basswood opens. Owing to the intensely hot weather it has been a difficult matter to keep swarms in after hiving them, and shade, ventilation, room and every conceivable method to make them comfortable had to be resorted to.

We have been using very extensively the wedges designed by Mr. S. Pettit. They are placed between the bottom board and side of the hive and have undoubtedly been of great advantage.

We have a splendid lot of comb honey, and the extracted is of the very best quality. We shall to-morrow (July 16th) remove some fifty cases of finished comb honey, and then refill these with empty sections. If they are not filled with thistle and basswood honey we shall have them filled with buckwheat. If plenty of buckwheat were not within easy distance we would not put on any more comb honey supers, but double up the remaining supers now on and put upon the balance extracting supers.

The beginner should not allow well filled sections to remain on the hive, and as soon as there is no more prospect of honey, remove even the unfinished sections. To leave them on longer would result in travel stained and soiled sections. These never sell as well as that of good appearance. See that every colony has a laying queen. This is particularly necessary after a season of excessive swarming.

If colonies are weak and no prospect for even a moderate honey flow to keep up breeding, double up the weak colonies, or

if you are particularly anxious for increase, stimulate the weak colony to breeding by feeding sugar syrup. If the latter is resorted to feed late in the evening so that the colony will have stored the syrup and assumed its natural condition before morning when it is liable to attack from robbers. Allow no honey or combs containing honey to be exposed. If you have to examine colonies get through your work as quickly as possible and do that work as late in the day as you can, the bees have but little time to get started before dark, and unless they have made considerable headway they will not continue the attack next morning. Brantford, Ont., July 14th, 1897.

## Preparing for, and Wintering.

R. C. AIKIN, Loveland, Col.

During the honey flow is the time to begin. If there is an old queen, she should be superseded. A queen may pass the season and seem all right, yet there is no disputing the fact that young queens will pass the winter and spring with less loss than the old ones.

I have had a chance to make comparisons, several times. I practice the unqueening method of controlling swarms. I also clip my queens. As my honey flow comes in June and July, no fall flow, the unqueening and requeening is done in early summer. If I unqueen in June, the young queens will get to laying in July. I pay no further attention to young queens than to know that they mate and get to laying, until spring. While looking one in the spring I clip all not already clipped. A record is kept like this. Upon finding the queen, if she is clipped I know that she is more than one year old, so I record 5, 3, O. Q. (May 3rd old queen). If the queen is not clipped I clip her and record 5, 3, c'p'd. This may be done in April or May. When I unqueen in June I save the recently clipped queens, which are of course not quite one year old, as many of them I may want to preserve, though if some of these are not good I save of the most vigorous of the two year ones as many more I may need. This is an easy way to keep track of them, and have only young queens.

I have wintered bees so handled, and those allowed to swarm and do their own superseding, side by side, and I find

loss of queens in winter and failure before the honey flow, to be twice as great in the latter. This means that if 10 per cent. will fail in those having only young queens, 20 per cent will fail when the bees do their own superceding. It pays, then, to go in to winter with queens in their prime.

For those who have a fall flow, perhaps the best time to supersede would be then. If natural swarming be practised it would not be hard to keep a simple record—a temporary one would do—so that all old queens would be known. The current season's swarms contain the bulk of old queens.

The next important thing is plenty of stores. Here, too, I speak in the light of experience. I have a good many times lost heavily for no other reason than because there was not stores enough. What is enough? That depends on locations. In my present field, if there is to be neither leading nor equalizing of stores, not less than 50 pounds. We get very little before June 15th, and very little after August 1st. If your location furnishes honey in April and May, or say from frost to frost, perhaps 25 pounds is enough. Whether wintered out or in makes a difference. Let each colony have from 5 to 10 pounds more than they can possibly use. Ten pounds per colony in 100 colonies at 10 cents per pound is \$100. You cannot invest \$100 anywhere to better advantage. That honey in the hives is worth more than cash in the bank. Let the colony have room and plenty of stores. I have for years run for both comb and extracted honey. Every apiarist who has produced both knows that the comb honey colonies are heaviest every time. I found by experience that the comb honey colonies winter best, and the reason is that they have the best honey, closely packed.

Young bees are also a necessity. In this locality nectar is not found except in limited quantities, after September 1st at most. Usually so little comes after July 1st that breeding almost entirely ceases by the middle or latter part of September, and the days will be warm and the bees flying all through October, November and December, so that when January and February arrive they are quite warm. I never had safely started in the spring until there was a goodly number of hatching bees. I want hatching bees in February. If the latter part of winter, or say January and February be very cold, we are almost sure to lose pretty heavily, because the long days fall, and no chance to replenish by young bees in February and March, soon makes a colony to weak too rally.

We find, then, that we must have a lot of

young bees for winter. The colony should have hive room enough that they can have breeding room and plenty of stores at the same time. These are my conclusions after using hives of almost all sizes and shapes. The matter of the size of hive hinges largely on what the location will bear, though I believe it is very, very much more safe and profitable in the long run to err in having the hive too large, rather than too small.

#### PACKING.

I surely believe in some protection in winter. I have had several years experience in Iowa, and suppose that Canada in the main, is somewhat colder. My present location, N. E. Colorado, has as great range and more abrupt changes, than Southwest Iowa, but the atmosphere is dry, the ground nearly always free from snow, and sunshine nearly all the time. It is very common for the temperature, in winter, to be up to 30 to 50 in the heat of the day, and near zero at 9 or 10 at night. Notwithstanding the abrupt and extreme variations, the changes are not felt by man or bear as a much less degree would be felt in most climates.

For this climate I would pack with the hives fronting south, and leave the fronts open, packing 3 or more inches on the back and sides, while the top should have not over 2 or 3 inches and the cover close down on the packing material. The sun shining so much will make the hive fronts so warm that the bees will cluster against the warm part like a kitten against a warm brick, while the shallow packing on the top with the cover resting on it will heat through and through, adding warmth to the interior and taking out moisture that accumulates about the top. I think this is a good idea in the spring also, for it helps the colony in breeding.

While in Iowa I wintered both in cellar and out doors, and if I were there now I would cellar winter. My experience was decidedly in favor of the cellar. I feel confident that in those earlier days we wintered at too low a temperature—about 35 to 45 F.—and without proper ventilation of the hives. With so low a temperature as 30 to 40 the tendency is to stagnate circulation, and precipitate moisture in the honey, and on the hives. A temperature of 40 to 50 with hives well ventilated, I think is the better way. Of course the strength of the colony has a bearing on the temperature and the matter of ventilation. A very strong colony with a good upward ventilation would stand a higher temperature of the cellar than if not ventilated. Whether in the cellar or out doors, there

should be plenty of stores. I know that plenty of stores and a normal condition of the colony are essential always in wintering.

Packing should never be so deep that the colony cannot get the benefit of the outside warmth when the day is pleasant and sunny, for if they become weak and not able to heat the hive it becomes to them a sort of refrigerator. If they be packed very deep, there should be ample ventilation, especially above, to let out dampness. If there are bees enough to warm the hive and cause evaporation sufficient to keep the hive and combs dry, it will matter but little how deep they are packed. Their fight is against cold, and the accumulation of moisture making the bees damp, makes the cold so much harder to bear. I can stand 10 to 20 degrees more cold or heat in Colorado than I can in Iowa, simply because dryer.

It is important, then, that the bees be kept dry, and the weaker the colony the more external heat required. Make the protection in such way as to obtain the most heat, and retain the least moisture. I have thought for several years, that one cause of diarrhoea was the bees taking up the surplus moisture that drips on or about them, and not being able to fly and dispose of it.

### Exhibit of Ontario Honey at the Imperial Institute, London, England.

Toronto, May 27, '97.

DEAR SIR.—I enclose report of honey received from Mr. Watson. After reading please return here for filing. This refers to the former shipment, of course, not to the consignment you have recently sent.

Yours very truly,

C. C. JAMES,

Deputy Minister of Agriculture.

R. F. Holtermann, Brantford, Ont.

Report by the Director of the Scientific Department on a sample of Canadian Honey, received from Mr. Harrison Watson, Curator of the Canadian Section, Imperial Institute, and labelled "Pure Machine Extracted Honey, Exhibit of the Ontario Beekeepers' Association," embossed on the capsule on the cork of the bottle "Warranted Pure Honey."

The sample as received from Mr. Watson was an opaque and nearly white crystalline

solid. Its smell was aromatic, recalling in some degree that of peppermint. Its reaction was faintly acid to litmus. The sample has been submitted to examination and analysis with the following results, showing the percentage of the chief constituents:

Water (exposed at 100°).....	18.07	per cent.
Ash (Mineral constituents)...	0.16	" "
Matter insoluble in water.....	trace	" "
Dextrin and Lavalose .....	81.44	" "
Starch and Dextrus.....	none	" "

The honey exercised a levorotatory action on a ray of polarized light; the specific rotation was high— $[\alpha]_D = -11.85$ . This levorotation was not affected by boiling the honey with dilute acid.

From the results of this examination I am of opinion that this sample consists of genuine unadulterated honey.

WYNDHAM R. DUNSTAN.

May 5th, 1897.

### Notes and Pickings.

BY D. W. HEISE.

(CONTINUED)

Dr. C. C. Miller in a straw in Gleanings, 477, says: It looks strange to see supers nearly filled with honey, and no sealed honey in the brood frames; but that's common this year. Strong colonies and a sudden flow of great abundance. "That's just the order of things at Bethesda. No laid down rule will apply this year, especially so in regard to swarming. All rules are utterly ignored. The bees will and have done all sorts of funny things, and when such is the case, how convenient it is to have the queen's wing clipped.

Excessive swarming is much complained of this year. The rather backward weather during the middle of June, and the intense heat of the past two weeks, together with a sudden and abundant flow of nectar is no doubt the cause.

The extreme high temperature which we have just passed through, has caused a considerable number of combs to melt down in several apiaries in this locality, one comb only in my own yard. It makes a very bad mess of things and perhaps could be avoided by proper care.

Raspberry and Alsike clover opened up simultaneously in this locality. I think I never knew raspberry to secrete nectar so abundantly as this year, and the bees showed a decided preference for the berry

while it lasted, although clover was in full bloom. I feel sure considerable surplus was stored from berries this year.

Mr. G. M. Doolittle in Progressive Beekeeper, says that this is the secret of successful honey production in a nutshell: "First, secure the laborers just at the right time for the honey harvest; then keep an eye on things, giving only just enough room in which to store all the honey coming from the harvest, and you are boss of the situation." There you have it. It's no longer a secret. Now profit by it. Right. But, some of us fail through no fault of our own to secure the laborers at just the right time. Fate is against us.

What next? Mrs. Grimmell in A. B. J., 420, advises taking out an accident policy before commencing to work with bees, she having received a cheque from the company in which she carried such a policy, as indemnity for only one bee-sting.

Notes and Pickings for July are badly mixed. Mr. Editor will you wade into that Printers' Devil for a few minutes with a club, and waken up his ideas. The Editor too seems to have been watching for swarms.

White clover as usual in this locality has amounted to very little for the bees. Alsike yielded well but is about dried up at this date, July 12th. Very little is to be expected from Basswood. A few trees only are very full of buds but the majority have none at all. But like Mr. Pettit, I have great faith in Canada Thistle.

Mr. Ed. I may have something to say in my next about the much abused carnivores, over half of my stock is of that blood. This year's experience thus far is that they are no worse for swarming than my other stock.

### The Buffalo Convention Notice.

STA. B, TOLEDO, Ohio, July 4, 1897.

MR. EDITOR:—Will you please say in the next issue of the Canadian Bee Journal that the next annual convention of the United States Bee-Keepers' Union will be held in the Main Hall of Canton's Business College, corner Main and Huron Streets, Buffalo N. Y., commencing at 10 o'clock A. M. of Aug. 24 next and closing on the afternoon of the 26th.

Papers are to be read by W. Z. Hutchinson, P. Hotermann, E. Whitcomb, Hon. R. L. Taylor, Mrs. L. Harrison, B. C. Aikin, G. M. Doolittle, Dr. J. P. H. Brown, Hon. Eugene Secor, Geo. W. Brodeck, M. B. Holmes, A. E. Manum, E. Kretschmer, and P. H. Elwood; to which will be added the President's Address and perhaps

the General Manager and the Secretary may have something of interest to present.

The programs are now printed and in the hands of the Secretary. There are six beekeepers' songs, with music, in the program, and abundance of time is allotted to the discussion of all papers, and for the asking and answering of questions.

Any one not a member of the Union can have a program sent them by mail on receipt of 5 cents in postage stamps by the Secretary.

Several of our well known bee keepers, such as A. I. Root, Dr. Miller, S. T. Pettit, and others who are not on the program, will be present to help make the convention interesting and instructive.

It is probable that suggestions will be made at this convention in the line of so amending the constitution of the Union as to remove its objectionable features and add such other provisions as may seem desirable, and suggestions in this line by those not able to be at the convention can be sent to the Secretary, to be brought before it. Some suggestions have already been received by the Secretary, and others have been made in the bee papers.

Those going to the convention should buy round-trip tickets to the Grand Army of the Republic encampment (not to the United States Bee-Keepers' convention), which meets at Buffalo during the last week of August. The G. A. R. have secured a rate of one cent a mile each way in the territory of the central passenger Committee, which is included by Toronto, Canada, thence on a line to Port Huron, Mich., all of the southern peninsula of Michigan; Chicago, Peoria and Quincy, Ill., St. Louis, Mo., Louisville, Ky., and Pittsburg, Pa. The Western Passenger Association and the Trunk Line Association make a rate of one fare for the round trip in their territory to places in the Central Passenger Association, from which points the fare will be one cent a mile each way, but tickets must be purchased to Buffalo from the starting point. Enquire of your ticket or station agent in all territory outside of the above-named for rates and the time the tickets are good for, for I have been unable to learn the rates in such Territory, but presume it will be the same as that of the Western Passenger and the Trunk Line Association; but be sure to inquire of your ticket agent as above suggested.

In the Central Passenger and Trunk Line Territory tickets will be good going on the 21st, 22nd, and 23rd, and if visited at Buffalo will be good, returning for 30 days.

Mr. O. L. Hershiser, of Buffalo, has charge of arrangements at Buffalo, and will attend

to the matter of hotel rates. He writes: "I purpose obtaining accommodation in private families for all bee-keepers who prefer such to hotels." Members of the Union can learn in regard to hotel rates by

applying to the Secretary at the place of meeting. If known in time, hotel rates will be given in the bee periodicals.

A. MASON, Sec.

## Questions

How can I manage my bees to prevent feeding them in the fall of the year?

If you run your bees for extracted honey I do not think it makes any difference what size of hive you use, your brood chamber will generally be scant in the fall, but a 10 frame hive would contain more honey than an 8 frame hive. The problem that many bee-keepers have been trying to solve is how to get the honey stored in the supers and not in the brood chamber. In running for comb honey, I believe a 10 frame hive would always have sufficient stores below to winter, than an 8 frame hive generally will. I have used both. I am writing this now as of a good honey season.

WILL ELLIS.

If you have no fall honey flow in your locality, move your bees to where they can have access to a good flow, then do not extract from brood chambers.

WARRINGTON SCOTT.

This depends on the locality and nature of the honey flow. If you have no fall flow, I do not see how feeding can be avoided in some form or other, either by sugar or syrup or sealed stores saved from the early flow.

GEO. B. McCULLOCH,  
Harwood, Ont.

Don't take too much honey from them.

JOHN PIRIE,  
Drumquin, Ont.

Don't take away the honey which they store. If allowed to keep all they gather and yet they do not have enough for winter, then there must be something the matter with the locality, or the season, or the management. If all your colonies are short of stores, there must be a cause outside of yourself. If some of them only, per-

haps you allow them to swarm themselves poor.

EUGENE SECOR.

Either let them manage themselves—that is, let them keep all of the honey they gather—or move them to a neighborhood where there are large fields of buckwheat.

R. A. MARRISON,  
Inverary, Ont.

In locations where there is a buckwheat or fall flow bees usually gather sufficient honey for winter stores. Where there is no fall flow enough combs of honey may be reserved from the extracting supers, or in the case of very large hives, there is generally sufficient stores in the brood chamber, if it has not been disturbed.

R. H. SMITH.

The only way to accomplish this is to use full size brood departments to your hives, and be sure to leave sufficient stores for the bees when you take your surplus crop. I have all along favored this plan to avoid the fussy job of feeding. But others prefer to take the honey and sell it and feed back sugar syrup at less price.

G. W. DEMARCE,  
Christianburg, Ky.

See that they have stores enough before "the fall" comes. To give an intelligent answer would require a knowledge of your locality. Some localities, during some seasons will not furnish enough honey for the yearly needs of the bees.

DR. A. B. MASON.

I cannot answer the above satisfactorily, as I know nothing of the capacity of the hive you use, the nature and duration of your honey flow, nor your mode of management, all of which must be taken

into consideration before an intelligent reply can be given. If you use a large hive, say 10 or 12 L frame capacity the probability is, there will always be sufficient honey in the brood chamber, even if none is gathered after 1st August, but if you hive your swarm in a contracted brood chamber, or use an 8 frame L hive altogether, then feed you will have to, unless you are so situated that you are sure of a flow from buckwheat, or fall flowers, to make up the deficiency. I use the 8 frame L and New Heddon hives, and am not in a buckwheat section, consequently as a rule I have to feed some every year, except when I move the colonies to fall pasturage, and even then I prefer to give 10 lbs. sugar syrup to each colony after having first removed some of the late gathered stores, should their be more than the bees require. My experience in the past, has taught me that such extra trouble ensures safe wintering. The late fall stores referred to, comprise golden rod, boneset, and wild aster, etc. and does not include buckwheat. There is however, a way in which feeding so called, may be avoided, no matter what size hive is used, and that is by supplying sealed combs from the top story, and thus avoid the late fall feeding of liquid syrup or honey, which exhausts to some extent the vitality of the bees. There is however, one objection to this plan, and that is: the having of two sets, or part of two sets of brood combs, containing some honey and pollen to be carried over until another season. I prefer no pollen in my extracting combs, for several reasons, none of which need be mentioned here.

G. A. GEMMILL,  
Stratford, Ont.

Remove all surplus receptacles in time for bees to store their winter's supply in the brood chamber.

If you use a large lower story you will likely get most of your hives containing honey enough and some to spare to give to those that are light "exchange combs."

A. D. ALLEN.

By using a large brood chamber, and not extracting to close.

JAT. ARMSTRONG.

Before attempting to carry out the above you should know that any system which fills the brood chamber with honey for winter stores, before or while the honey harvest is on, does so at the expense of important conditions necessary to obtain from your colonies the best results in honey. By all means work your colonies so that your brood chamber will be full of brood

and devoid of honey during the honey flow and feed in the fall. If you have a fall flow, let your bees fill up from that, if not, have combs filled in the upper story during the honey flow and give them these in the fall to winter on, if you object to feeding. See my paper in last month's C. B. J.

A. E. HOSHAL.

This question lies at the root of bee-keeping as a business. Keep all colonies strong when honey is being gathered; build up the weak colonies early in the season, and as a rule, they will be all right. With a poor season however, the lack of stores in the field must be made up by feeding in the hive. Strong colonies will gather sufficient stores if nectar is secreted. If there is no nectar feeding must be resorted to in any case.

J. E. POND.

There are seasons of course when the amount of "management" will prevent the necessity of fall feeding. Ordinarily, if the brood chamber is left untampered with the bees will see to having sufficient stores for the winter, especially if your district yields a fall flow from buckwheat, etc. Where this is deficient many bee-keepers resort to the transportation system.

W. J. CRAIG,  
Brantford, Ont.

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### Comb Honey Wanted.

We are prepared to purchase a limited quantity of first-class comb honey. In writing state the size of section, if honey is white and sections are well filled, if taken with or without separators, about average weight of section, the quantity you have to sell and price wanted. Any quantity less than 100 lbs would not be worth buying. Address—

Goold, Shapley, & Muir Co., Ltd.  
Brantford, Ont.

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### No Wonder He Was Sad.

Weary Watkins—What you lookin' so sore about?

Dismal Dawson—I met a guy to-day 'at tole me I was really workin' harder bumm'n' arounde a country than if I was actually holdin' a job. It may be true, too, for all I know.—Indianapolis Journal.

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"Gumbleton's hat looks a mile too big for him"

"That's the hat he usually wears next morning."



# Insect Wings

## Rapidity of Vibration in Flight.

(Scientific American.)

We should be decidedly remiss if in the study of this interesting insect we failed to investigate his means and powers of flight. His very occupation necessitates some rapid means of locomotion, and with this nature has abundantly endowed him. So great are their powers of flight that bees have been

countered by an insect with only the air for his support.

Nor is flight the only function of these useful members; they are equally indispensable in what might be termed the commonest drudgery of the household.

It must be borne in mind (notwithstanding the old rhyme) that bees do not make honey, they only gather it; and very rarely is it found in the nectaries of flowers in proper consistency to store for winter use. Falling dews and rains dilute it until, if stored in that condition in their warm hives, it would soon be vinegar, for which they have no use in their domestic economy.

Bees even gather, with great avidity, the maple sap from troughs in the "sugar bush," many gallons of which must be boiled into one to reduce it to keeping condition; it must be "boiled down," so to speak, and the wings are the only means by which that toilsome process is performed.

Their labors are therefore but half performed when the liquid has been visited the hives in the honey making season, night or day, and you will hear the incessant hum of their tireless wings.

As in the absence of blotting paper you sometimes blow upon the newly written page to promote evaporation, so by the vibrations of their wings the bees pass air

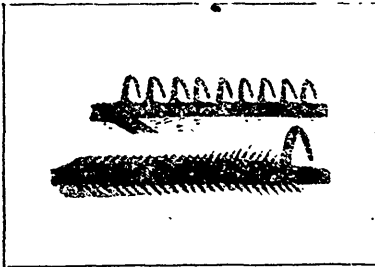


Fig. 1.—HOOKS FOR COUPLING THE WINGS OF THE BEE.

known to gather honey from buckwheat fields (a favorite pasturage) seven miles from their nearest possible habitation.

Not only are they capable of flying with great speed, but of carrying loads when on the wing which seem incredible.

Very often during the annual slaughter of the drones (the males, as before explained) have I seen a "worker" drag his victim, at least once and a half his own weight, from the hive, and after one or two efforts as if to secure and properly balance his load, sail lightly away and drop his burden only after going a long distance from the hive.

When we consider the difficulty of a person carrying a proportionate load, though sturdy of limb and with earth for a footing, we can realize the difficulty en-

currents over the honey to accomplish the same result. Never until honey is thus "ripened," to use the phrase of the beekeeper, will the cells be sealed or "capped"

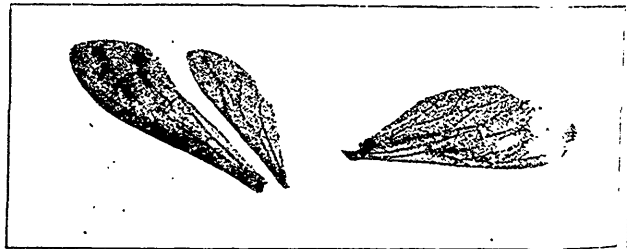


Fig. 2.—WINGS OF THE BEE (ENLARGED)

for winter use.

The wisdom manifested in inducing these air currents is often readily apparent. The entrance to a hive kept in my attic, for observation, consisted of a glass covered passage (between the hive and the window sill) about fifteen inches long by twelve wide and one-half inch high. During the honey making season the floor of this passage was often so obstructed with idle bees as to impede the passage of their more industrious fellows. When it was observed however, that the wings of these "idlers" were always in motion, so rapidly in fact that each clung to the floor to prevent

essentially like those of the common fly, with which we are, alas! only too familiar. Unlike the fly, however, which belongs to the order Diptera, or two winged insects, the bee has for a pair on each side. When closed they overlap upon the back, enabling the bee to enter flower cells unobstructed by his wings.

Unlike the butterfly and other four winged insects, the bee is provided with means by which the wings on either side may be coupled together, to secure unity of movement and greater efficiency in flight. The means provided is a row of twenty-one hooklets, a few of which are shown greatly

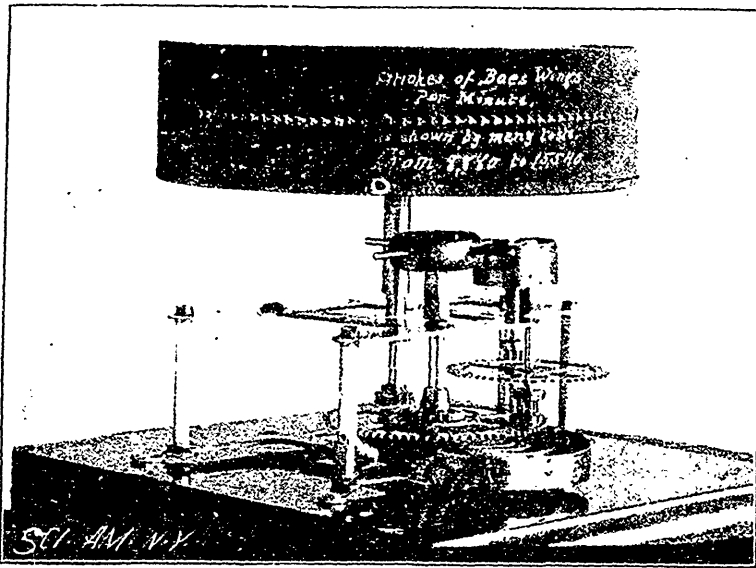


Fig. 3. WING STROKES OF BEE AS RECORDED ON SMOKED CYLINDER.

flight, and that all on one side faced one way while those opposite faced the other, thereby producing air currents in opposite directions through the same passage, and with the co-operation of those within, through the otherwise nearly air tight hive I felt like apologizing to the toilers for my slender thought, and was impressed anew that "they also serve who only stand and wait." So rapidly does the evaporation progress that when a hive is placed on a scale to note the daily increase, it is four times as heavy materially less in the morning than on the previous night.

The structure of the wing consists of a thin transparent membrane stretched over a delicate framework of horn-like substance,

enlarged in the accompanying cut

These hooklets, attached to the anterior rib of the posterior wing, are so placed as to engage the hindmost rib of the forward wing, and thereby render the two one in effect, as seen upon the right in the next view; and yet quickly disengagable (as seen at the left) for overlapping when occasion requires (see cut No. 2).

In addition to this unity of action on either side there is also operative connection between the wings on opposite sides, though I am unable to state how it is effected. That it exists is proved by the fact that if the wings on either side be moved up and down, artificially, those on the opposite side will move in unison with

them, though the bee may have long been dead.

The bee's wings are proportionately small in comparison to other insects—some butterflies of the same weight having perhaps ten times the area of wing. The lack of wing surface is more than compensated, however, in rapidity of vibration, otherwise such intensity and strength of flight would be impossible.

Having a bee tethered by a strand of fine sewing cotton around his waist (so to speak), that is between his thorax and his abdomen, I was struck with the strength of the little creature, as indicated by the strain upon the thread, whether above or on the wing.

With my little captive thus restrained, and contemplating the rapidity of wing movement necessary to produce such appreciable strain, I was impressed with a desire to know exactly the number of vibrations per minute, and following the impulse I am pleased to say I succeeded beyond the possibility of doubt.

While I realize that should I tell you I had counted them and that they sometimes exceed 15,000 per minute, and that I also have the certificate of the bee to the same effect, you would accuse me of treading, at least, on the borders of romance, yet I trust I shall be able to convince you that both assertions are practically true.

To effect this purpose I employed the running gears of a clock; and substituting a longer shaft for that which carries the minute hand, erected thereon a wooden disk surrounded with a two inch band of highly polished tin, thereby forming a short cylinder 18½ inches in circumference, which, controllable by a specially constructed governor, was revolvable at any speed within reasonable requirements.

When thus arranged, the cylinder was revolved slowly above a smoking lamp until so coated as to have the appearance of black velvet. It was found that this coating could not be thrown off by the highest speed obtainable, and yet that it adhered so lightly that a hair passed over it would leave its tracery upon the tin. With the cylinder rapidly revolving, a bee with his six legs held in light forceps, but with wings free and struggling to escape, was brought carefully near the revolving surface. At first contact the track was swept clean, leaving no evidence of the frequency of his strokes, and showing that increased

velocity of the cylinder must be resorted to. After tiring out many bees, re-covering the cylinder many times, and finally increasing its speed to 120 revolutions per minute, I was rewarded with many wing-engraved records, one of which is shown in the accompanying cut (Fig. 8).

In this case the wing tracks seen upon the cylinder were precisely seven to the inch, which number, multiplied by 18½ (the number of inches in circumference) and that by 120 (the number of revolutions per minute), gives the highest result inscribed upon the tablet on the cylinder, the results having been inscribed after the experiments were completed, the lowest number given being the record made by the bee, who having become exhausted, was making but slight efforts to escape.

The certificate of the bee, to which I have

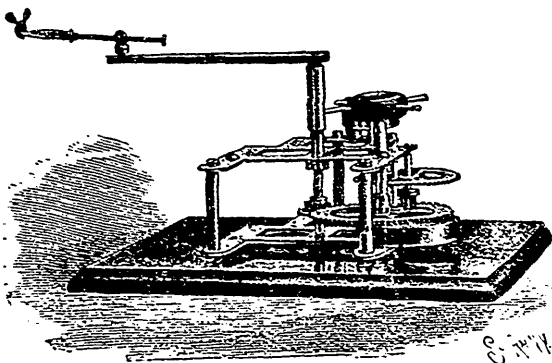


Fig. 4.—BEE MOUNTED ON REVOLVING LEVER

referred, might be interpreted thus:

I hereby certify that when in flight I sometimes vibrate my wings at the rate of 15,510 strokes per minute.

Signed (pointing to the wing tracks)  
his  
APIS A MELLIFICA  
mark.

While these results were entirely satisfactory and conclusive, yet, while pursuing the experiments, foreboding failure, I conceived yet another plan, which, from its very fascination, I was impelled to carry out, and which, though falling very slightly short of the highest record, yet virtually corroborated the results obtained by the former process.

Removing the cylinder, I substituted therefor a wooden lever or "hand" so to speak, which, with the apparatus standing upright, would revolve as the hand of a clock, and fixed the outer end to

to receive the stage forceps of the microscope.

When thus arranged, the legs of a lively bee were caught within these forceps, and thus pinioned, he was laid, back down, upon a surface covered with very tenacious glue and then another covered with thinnest gold foil cut into small squares, and there held until one of same adhered securely to his wing.

When thus caparisoned, the forceps were attached to the outer end of the lever and the bee was ready for his flight (see Fig. 4). This picture was taken, however, after the bee had fulfilled his mission, and, thoroughly exhausted, had ceased struggling to escape; the object being merely to show the

I confess to many failures. Many tests were made and the pictures developed, only to discover that the bee had "left no sign."

At last, as a freshly captured subject made the circuit, his track was seen to scintillate, and on developing the picture the result was at once apparent, as plainly shown on the screen. (See Fig. 5). At each vibration he had thrown into the camera a wingful of sunbeams. The insect and rapidly moving parts of the apparatus show only in dim, shadowy outline, but in his flight, with gold tipped wing dipped in sunshine, he has inscribed his record on the sensitive plate as unmistakably as if graven in stone.

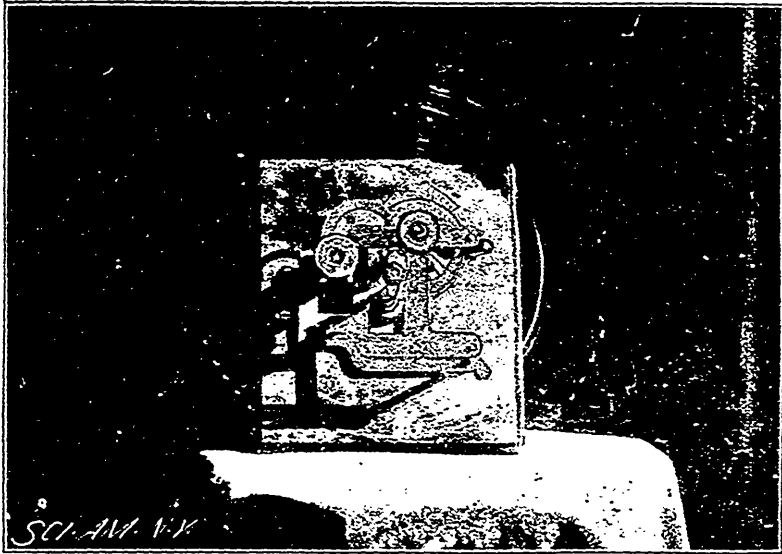


FIG. 5.—HORIZONTAL VIEW OF APPARATUS SHOWN IN Fig. 4. SHOWING SCINTILLATIONS OF THE WINGS.

arrangement of the apparatus and the gold tipped wing of the insect.

The theory was that a bee thus equipped, if photographed in the bright sunlight while in motion, might throw flashes of light into the camera, which, on account of the advancing movement, falling in different places, might be counted upon the plate.

The "snap shot" of the camera was so arranged that the exposure would be only about three-quarters of one revolution, that there might arise no confusion by passing more than once over any part of the track,

\*Extract from an illustrated lecture delivered by Aurelius Steward, of the Bridgeport, Conn., Scientific Society, at Cooper Union, New York, upon the subject of "The Honey Bee."

The Judge—Didn't I tell you the last time that you were here that I wanted to see your face in this court no more?

Weary Watkins—You did, yeronner, and that is exactly what I tole the cop.—Indianapolis Journal.

# Seventeenth Annual Meeting

of the

## Ontario Bee-Keepers' Association

Held in the Council Chamber of the City Hall at the City of Toronto,  
December 8th, 9th and 10th, 1896.

(Continued.)

Mr. Evans—I understood from the report that formic acid had the effect of reducing the growth of this disease. Would it not be a good experiment to take a foul brood colony and increase the quantity of formic acid in the honey fed to them and ascertain whether it would ultimately have the effect of destroying the foul brood, or see how far it could be safely fed?

Secretary Couse read the Directors' Report.

On motion the Directors' Report was received and filed.

Mr. Holtermann moved, seconded by Mr. Best that it is the sense of this Association that it is desirable to have an Order in Council passed fixing the percentage of water permissible in honey, and that this matter be left in the hands of the Executive Committee.

The President put the motion which was carried, seventeen voting for the motion and eight against it.

The Secretary moved, seconded by Mr. Holtermann that the words "in the month of December" be inserted in the motion passed fixing the next place of meeting at Hamilton. Carried.

After discussion Mr. McEvoy moved, seconded by Mr. A. Black, that the Association take the Canadian Bee Journal again, and that it be given to the members.

Mr. McKnight moved in amendment, seconded by Mr. Walton that this matter be left entirely in the hands of the Board of Directors. Lost.

The main motion was then carried.

### QUESTION DRAWER.

Has anyone present had any experience with the white fungus or pickle brood as described by Dr. Howard in a recent number of the American Bee Journal?

Someone asks for a remedy for the destruction of the small wax worm, principally on section honey.

Mr. Holtermann—I think the Association

will agree with me in saying if you go over your sections and remove those sections that have pollen in them you will find no difficulty in connection with the bee moth.

Mr. Heise—I think I know the gentleman who put in that question. The worm he is bothered with is not the ordinary moth worm; it is a very small worm. I have seen several sections, as many as a dozen, and he tells me he had a great many more destroyed by a very small worm that works on the cappings of the honey. The worm I have seen does not exceed three sixteenths of an inch in length and is about as fine as a little thread.

Mr. Holtermann—I would advise that a sample be sent to the College at Guelph and to the Dominion Experimental Farm, Ottawa.

Mr. Switzer—I have noticed a moth this summer; it is a smaller worm than the common bee moth and it works on the surface of the comb; it is of a pinkish color; some of them perhaps would be half an inch in length.

Mr. Pettit—What becomes of them in the end?

Mr. Switzer—I don't know; I didn't wait; I have destroyed any that I have discovered, but I am satisfied they are not the common bee moth; they do not burrow through the combs like the other, but they work on the surface, on top, and they have a webby formation a good deal like a caterpillar, but it is all on the surface. I saw it in two or three hives that had become queenless and the bees had died out in the fall and left the combs; there was no honey of any kind left in them, but there was some pollen.

Mr. Best—The suggestion of Mr. Holtermann would certainly settle that to the satisfaction of all.

Mr. McKnight—Is there anybody present that has ever suffered the loss of one sect-

ion of honey in one year from the bee moth?

Mr. Holtermann—I have.

Mr. Gemmell—I never did.

Mr. Heise—I have seen it this year with not a particle of honey in the section.

Mr. Armstrong—I have seen this pinkish worm as much as ten years ago.

Mr. Evans—I have the idea that the moth was the one that burrowed in the comb, but that this other was simply a wax worm.

Question: Is the action of the Government in sending out bureau lecturers beneficial or detrimental financially to us?

Mr. McKnight—I don't think it is of any advantage.

Mr. Holtermann—I have been out on farmers' institute work during the past week, and as you know, bee-keepers have had a good deal of difficulty in getting the public to understand that they should not spray during fruit growing. In the evening particularly it is largely customary in the majority of institutes to have the ladies and gentlemen appear and they have a generally good time.

Now, one of the subjects that I, as a rule, take up, is the relation of the bees to plant life; that subject can be brought forward every day we are finding more and more the very important part that the bee is playing in relation to horticulture.

Professor Fowler delivered a very able address in Kingston before the fruit growers' Association upon this subject. Take, for instance, the Northern Spy apple and plant it alone, and you cannot get a single Northern Spy apple. We know for years that the whole construction of flowers was such as to secure cross fertilization, but we did not know until investigations had been conducted, the greater importance of this question that pollen, although mature, from a Northern Spy apple could not fertilize the corresponding part of the flower, and the necessity of having these varieties mixed together. Now, one of the desirable things to advance the cause of the bee-keeping industry, is to bring that before the general public; then, to point out that the fruit grower and the bee-keeper are a class of men who should be united, who have a common interest; and then to point out that the Entomologist, whose duty it is to study the habits of the injurious insects, says you cannot reach these if you spray during the time the trees are in blossom; more than that, parts of the flowers are so delicate that you run the chance of injuring those parts and not alone have you lost your time, and your material but you are actually running the risk of injuring your flowers and you will not get the same amount of fruit.

Mr. McKnight—Do you mean to say that the Northern Spy Apple tree has not the power to fertilize its fruit.

Mr. Holtermann—Most assuredly.

Mr. McKnight—You have no authority to say that.

Mr. McEvoy—In my locality Prof. Shaw set out twelve acres of pure northern spies sixteen years ago, and this year, this great fruit year, there was not an apple on the twelve acres.

Mr. Gemmell—There are any amount of Northern Spy apple trees that do not bear till they are twenty years old.

Mr. Hoshal at this point answered some questions on wintering bees in shallow frames.

Mr. McEvoy—Mr. President, I think it was generally the opinion here last night that the keeping of the brood so close to the super that when the honey season ended there would be nothing in the brood chamber; and what is Mr. Hoshal going to do in the winter? Is he going to have to resort to feeding? On that ground the members here would imagine that would be a poor system to follow, but Mr. Hoshal did not explain how he provides for that.

Mr. Hoshal—There are two ways I provide for that. If you wish to winter upon natural stores, during the summer season we have one of those brood cases filled with honey which is our extracting super; the brood case and extracting super are the same thing; we simply set that aside and when the fall comes and the hive is stripped we put it on top and the bees go into it.

Mr. McEvoy—Do you put a half storey on, or do you winter on these shallow hives? Could you winter on a single Hedden Hive?

Mr. Hoshal—Certainly, we do it winter after winter and have done it since 1887, colonies up to 80, 90 100, right straight along both inside and out, but remember those sections are full of honey, all the honey the combs will carry, there is nothing left in them, what you might call vacant combs for the bees to stick their heads into; it is all filled. They are filled, whether they are full of natural stores or whether the bees are fed with syrup in the fall for them to fill them up.

I have better results where we use two cases or ten Langstroff frames; we have very strong colonies, and when those colonies winter well they certainly beat those that are wintered in single sections, but those colonies that are wintered in two sections vary a great deal. Some of them will be real strong, the same as they went into winter quarters, and some will be reduced until they are very weak

and they are in all degrees of strength from that up. Those wintered in single sections are more uniform throughout and pretty much the same as you put them into winter quarters. Another point I would like to emphasize and that is the feeding in the fall. It seems to me the Association looks upon it as a tremendous job to feed bees. To me this is one of the simplest things in the world; it would make very little difference in the work between supplying them with a case filled with honey or supplying them with liquid food to be taken up from the feeder. I use a bottom feeder; it is a Hedden feeder put underneath the hive and arranged with a rim so that it can be used there. It is simply a matter of lifting the single case from the bottom board and setting the feeder on it, and then in the evening, just about sundown weighing out the amount of syrup that your bees want.

Mr. Holtermann:—When you are putting that half storey in the cellar how do you prepare it, and how does it stand in the cellar? What is there on top and what underneath?

Mr. Hoshal.—I have tried that two or three ways. We have a couple of triangular blocks cut, in the winter time. There is a stand, first of all, in the cellar and the hives are piled four deep on top of that with the bottom board on; I have tried just letting them stay there without anything else; we have no cover on them, nothing but the regular outside cover and bee space between sealed down tight; the only difference outside of that is to take the front part of the hive from the bottom so as to lift the space between it and the bottom board up, simply prying it up and slipping under one of those entrance blocks, which will be about two inches.

Mr. Gemmell—Do you put any rim underneath them outside?

Mr. Hoshal—No.

Mr. Walton—When they are in the cellar will they not do with their natural entrance?

Mr. Hoshal—I have wintered the two ways, one with the full entrance to the hive, with the entrance block off; another way is, I raise it up from the bottom. I really could not see any difference one way or the other, and I have simply come back to the way I do in the summer.

Those wintered in the single sections were more uniform than those wintered in two.

Mr. Holtermann—I must confess that I have never quite accepted that theory. If bees wintered properly, and so long as they are wintered properly the queen bees will not want to breed, and if you have to use that means—that is, give them no empty

cells—it would be to me an indication of wrong wintering; and then your bees are beginning to consume and as they begin to breed there will be a larger number of cells becoming vacant and a greater amount of room. I would rather think that the strength of a hive lies in this, that your queen has not the desire to lay and does not lay for that reason; but your stores, in the condition in which Mr. Hoshal mentions are well covered by the bees; you know that if a portion of that hive is away from the bees, the bees throw off moisture and that becomes cool, and that moisture from the bees is absorbed by that honey that is not covered by the bees and the stores become sour and of course deterioration sets in. Isn't that the case?

Isn't this also the case that as the bees winter poorly they become restless. They consume more stores and at the same time there is a loss of vitality going on. The result is that the brood rearing sets in and that would appear to some to be an effort of nature to replace that lost vitality, and not being able to fly when they are brood rearing, that instinct is only intensified.

Mr. Hoshal—In stating what I have to say I am merely stating facts; I am advancing no theory, but, as it comes up, I might state that one of the things to be kept in view in wintering bees, no matter whether it is a Hedden hive or any other hive, is to make the hive of such a capacity that the bees that are wintered in it will fill it and entirely cover all the combs; that is, there is no space inside but what is occupied.

Mr. Gemmell—I think the question was asked last night, whether bees could be wintered on such shallow cases as five inches deep. Of course they can. If you don't believe it just try it. I have done it and I never had bees winter better.

The President—We have the honor of having with us His Worship Mayor Fleming of Toronto; we are certainly pleased to have him with us. I presume the time at his disposal is very limited, but I have no doubt he would like to say a few words to us and I am sure it would be a great pleasure to you to listen to whatever he may have to say. I have much pleasure in introducing his Worship Mayor Fleming to you. (Applause)

MAYOR FLEMING.

Mr. President:—I have more sense than to intrude upon your time with making any lengthy remarks. I regret very much that I had not an earlier opportunity of dropping in to listen to your discussions here, but I am an extremely busy man, and scarcely know what to do first. I have read with a great deal of pleasure the reports of

your proceeding in the public press. Toronto has become noted as a City of Conventions; I know of no convention that the people are more pleased to have in the City of Toronto than the one represented by the sweetness that you represent here to day. I have read, as I have stated, with a great deal of pleasure of your proceedings and I have been glad to see the way you have conducted your meetings. I thought several times, while I peered in the door and saw some of you sitting in those chairs, that you would make splendid aldermen for the City of Toronto, and if any of you have any notion of leaving the part of the world in which you reside at the present time I don't think there would be the slightest difficulty in making an opening for you and securing for you some of those seats. Those seats may not always be comfortable but I can assure you that the seats you occupy there are a great deal more comfortable than the seat I occupy.

On behalf of the citizens of Toronto I thank you for gathering here. The City Hall will be always open to you if you desire to meet here again, all you have to do is to ask for this building and you will get it with a very great deal of pleasure.

Mr. McKnight—I wish to do what I know will be heartily responded to by the members of this Association; I wish to tender to the Mayor of Toronto a vote of thanks for his condescension in coming here as the representative of the largest and most important city in this province. The city has put a spacious and comfortable hall at our disposal and we feel truly grateful for it. The only grievance I have against the city of Toronto as a bee-keeper is that there is not, within the corporate limits of this great city, one person who is a member of the Ontario Bee Keepers' Association. I hope Mayor Fleming will go down to the Secretary and pay his dollar (Applause)

Mayor Fleming—Do any of your Association vote in Toronto? (Applause)

Mr. McKnight—We as bee-keepers appreciate, Mr. Mayor, the good wishes of the city of Toronto in putting at our disposal the use of this council chamber for three days; perhaps we have not valued the privilege as highly as we ought to. The Mayor says that Toronto is a city of conventions. I want to tell Mayor Fleming that amongst all the conventions that come to this city and have the use of this council chamber, there is not one the personell of which is higher in intelligence, good looks, morality and everything that goes to make the man than the bee-keepers of Ontario. We deal with a very small creature the little busy bee, but there is in that little busy bee a very great deal to call out admiration.

We look upon ourselves, whatever you may think of us, as being a very important body in this province.

Mr. Evans—I have great pleasure in seconding a vote of thanks to the Mayor for his presence here, and also for the use of the hall. I placed at the disposal of the Association the county council chamber, and I don't know why it is, but they preferred to come here. We in the County of York have to meet pretty often with the aldermen and mayor and we find they are not bad fellows. We occasionally find, (and I think the bee business has one peculiarity which is somewhat in the line of the municipal men) that they are great stingers. But I can assure you the Mayor is perfectly harmless that way.

We are under great obligations to the city for allowing us to meet here and I trust the members have had such a good time that it will not be long before they come back to the city of Toronto.

The President—It is certainly a pleasure to put this motion to this association.

The motion was received and carried with applause.

The President:—Please accept, sir, the feeling of this meeting; the action is but the indication of the thought of our hearts.

Mayor Fleming—I am thankful to the mover and seconder of this resolution. The city of Toronto did no more than it felt a great deal of pleasure in doing; we are always anxious and desirous of encouraging to come to our city those from other parts of the Province of Ontario and we feel it a pleasure to do so; we feel it a pleasure to accommodate those who are part and parcel of ourselves. The prosperity of the city of Toronto depends very largely on the prosperity of Ontario; if the province is not prosperous we cannot expect the city to be prosperous.

I shall be glad if you can see your way clear to come back to the city of Toronto again and occupy this building.

I did read with a little regret that you were going up to Hamilton, but after all Hamilton is part of Toronto, or it will be soon. It will not be long before the people of Hamilton are doing their business largely in the city of Toronto and if in the course of a few years you should decide to go to Hamilton you will only be deciding to go to one of the wards of the city of Toronto. (Applause)

Mr Evans moved, seconded by Mr. Gemmell, that a vote of thanks be tendered to the Press of Toronto for their very excellent reports of the sittings of this convention. Carried.

This concluded the business and the President declared the Convention closed. 12.30 o'clock P. M.



## REPORT OF THE PROCEEDINGS...

of the Twenty-Seventh Annual Convention  
of the

## North American Bee-Keepers' Association

Held at

Lincoln, Nebraska, October, 7th and 8th, 1896.

By Dr. A. B. Mason, Secretary.

(Continued)



A commission man in Chicago told me that one-half more pure honey could be sold in Chicago if it were not for adulteration. Think what a market we would have then, while even to-day it is considered the best market in the world. In 1895, 1,200,000 pounds of honey were sold in Chicago.

Pres. Root—It is now 10 o'clock, the time for the chapel exercises of the University. In accordance with the agreement last night, we will now go to the chapel, where Dr. Miller will deliver an address to the University students.

The regular devotional exercises of the students were conducted by Rev. E. T. Abbott, at the close of which Chancellor MacLean said to the students: "We are favored this morning by the attendance of the North American Bee-Keepers' Association. We will now listen to an address by Dr. C. C. Miller, of Marengo, Ill., a man famous as a musician, bee keeper, humorist and orator."

## DR. MILLER'S ADDRESS TO THE STUDENTS.

As I look over the bright and earnest faces before me, a feeling of envy comes into my heart, to think that I cannot have the place the Chancellor has here. [Laughter.] And, then, I think if I had that place, I would be glad to exchange it for the place of one of those under his care. Dear friends, I wonder if you know what you have these opportunities, these professors and this Chancellor for.

When I look upon you, I go back—as I sometimes go back in dreams—to the time when I was in college. And when I wake from those dreams I wish it was true. My mind goes back this morning just 45 years. I go back to the time when, for two years—the last two years of my college course—for the sake of being able to write A. B. after my name, I kept house myself. I will give you an inventory of my China closet: One plate, one tablespoon—I didn't

need a teaspoon; one fork; one knife; one kettle. I lived on corn-meal—I could get that for less than anything else. I boarded myself for 35 cents a week. I would not advise any of you try it. I nearly ruined my health, but I am not sorry for the experience I had in those days. But, it seems to me, you ought to be thankful that you have a better chance than I had.

What did I work so hard for? I wanted a degree. If I could only write A. B. after my name, I would be one of the happiest men in the world. I don't know where the diploma is that has that on it. It didn't bring me the happiness that I supposed it would. When you get through your course, you will find that alone will not make you happy. You are here with advantages that will prepare you to have an influence over your fellow-beings, that you could not have without the training that you get here. It is valuable to you. I hope you will prepare for usefulness and happiness. Some of you are thinking only of what will make you happy. Advancement in study will not make you happy. There will be a vacancy left. Dear friends, I hope God will give me the grace and power this morning to impress upon your minds that the thing that will make you happy is to be useful to your fellowmen. To try to get some one to live a better life, to get a little nearer to the road that will lead him up to the life where all is joy and happiness.

Some of you may be thinking that you are to fill some great place in this world. I used to think about that. "Oh, if I could be a great man!" One of the greatest disappointments of my life was that I was not appreciated, and elected President. I thought I was made up for President of these United States.

The Chancellor—You must be a Nebraskan. [Laughter.]

And there were other things; nobody appreciated me. But I found after awhile

that there was One who could measure me, and know exactly what I was fitted for. The God that made me knows me through and through, better than I do. He placed me in a certain point, and then I found that I was to do his work joyfully, wherever he put me. Whenever you are ready to do that, you are going to be the happiest people in the world. I am the happiest man in our family, which consists of myself and two other women. [Laughter.] I am a happy man because I think I am doing the work that has been given me to do from day to day. I don't want to go away to foreign shores. I don't want to step into the Chancellor's place. I just want to do from day to day what the Lord wants me to do.

Now if you forget everything else, I want you to remember what I am going to sing to you. It is this sort of feeling that makes life worth a great deal to me. I want you to be happy in the just same way. The Lord bless you, and lead you for the betterment of the world and the salvation of souls. C. C. MILLER.

The Doctor then sang his song in a most acceptable manner.

At 10.30 the Association returned to Union Hall.

Pres. Root—Dr. Bessey informs me that owing to other engagements, the only time in which he will be able to address us is within the next five minutes. Are there any questions at present?

#### WINTERING AND FOUL BROOD QUESTIONS.

A Member—My bees have 50 pounds of capped honey in the brood-nest with 10 frames, chaff hives. Shall I contract to 6 frames for winter?

Dr. Miller—Let them alone.

A Member—That depends upon whether he winters them out-door or in the cellar.

Asker of Question—Out-of-doors

General cries—"Let them alone!"

Dr. Mason—What can be done by bee-keepers towards securing legislation in the various States for the eradication of foul brood?

Dr. Miller—I would write to me of those States that have been successful in securing legislation, and see how they have done it.

Pres. Root then introduced Prof. Chas. E. Bessey, who spoke on

#### A BOTANIST AMONG THE BEES.

Mr. President, I have brought here for distribution a few copies of the bulletin which I have published—a preliminary list of the honey-producing plants of Nebraska.

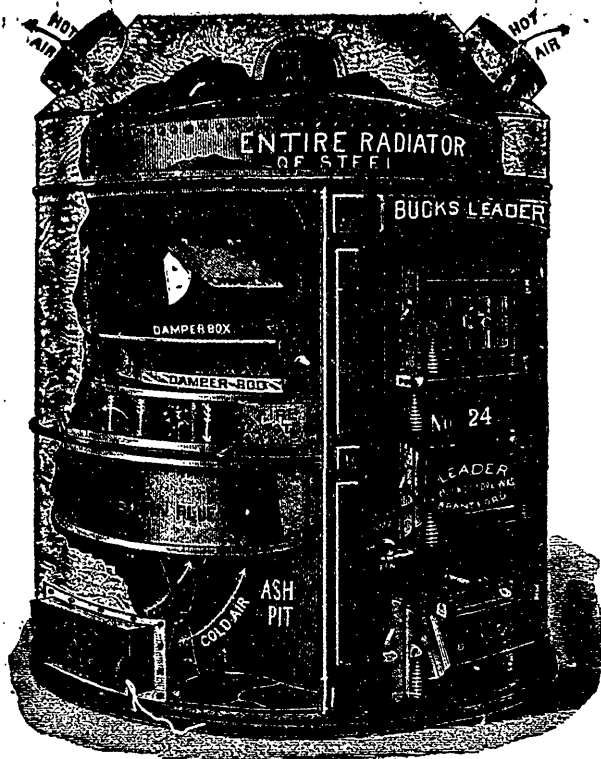
Now, the subject which I have is "A Botanist Among the Bees." I suggested to the Secretary that I should prefer to have it read this way, because I am merely a botanist. I am sorry that I am not a bee-keeper. I was once for a little while. But the cares of this world and other brambles sprang up—and you carry out the parable. The bee-keeping was choked off. So my knowledge of bee-keeping is merely a reminiscence. I am a botanist, but I have never been able to get away from the bee-keepers. They have been after me from year to year just as the bees used to get after me.

What can a botanist do among the bees? What can he bring to a company of men like you, that will be of any service? My business is to know plants; not merely to know them by name, for that idea of botany, which is the prevalent one, is not the idea that is held by botanists. Not merely to know the names of plants—that is a minor matter; but to know what plants are, how they live and get on in the world. Right here is where the botanist may be of use to the bee-keeper, and, through the bee-keeper, may be of use to the bees, which are domesticated, and under the control of the bee-keeper.

Among the matters that have come to the botanist these later years, are such things as the investigation of the relations existing between insects and plants. Now, these relations that the botanist discusses are not those that the entomologist takes up. The botanist investigates the use which plants make of insects; the entomologist studies the manner in which insects use the plants. The plants use insects, as was suggested last evening in one of the addresses. It is a fact that very many plants are almost entirely, and some of them entirely, dependent upon the presence of insects in order that they may propagate themselves. We have learned that the higher insects have these relations to plants in a very large degree. And the bees are among the most important of these insects, which aid in the fertilization, carrying the pollen from plant to plant, in order that there may be seed.

A plant is a good, honest thing, and always renders an equivalent. Instead of beguiling the insects to come and do some work, and then rendering no equivalent, these plants furnish something which the bees want. Now, there is where the nectar comes in. I may forget myself and call it "honey," but you will understand what I mean.

(TO BE CONTINUED.)



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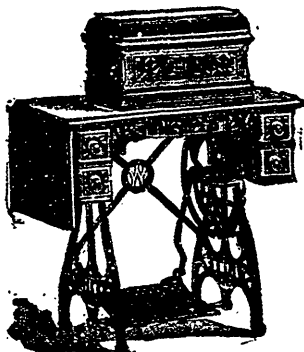
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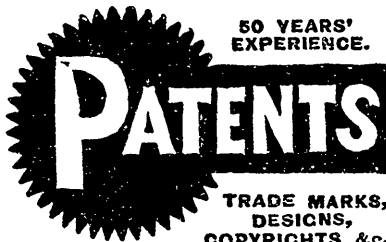
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