ANNUAL REPORT

OF THE

BEE-KEEPERS' ASSOCIATION

OF THE

PROVINCE OF ONTARIO

18th

1897.

(PUBLISHED BY THE ONTARIO DEPARTMENT OF AGRICULTURE, TORONTO.)

PRINTED BY ORDER OF

THE LEGISLATIVE ASSEMBLY OF ONTARIO.

TORONTO:
WARWICK BRO'S & RUTTER, PRINTERS, ETC., 68 AND 70 FRONT STREET WEST.
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FOR 1897.

To the Honorable the Minister of Agriculture :

DEAR SIR,—I have the honor to submit herewith the eighteenth Annual Report of the Ontario Bee-Keepers' Association, in which will be found the papers read at the Annual Meeting, held in the city of Hamilton, and a full report of the discussions thereon.

The report of the Inspector of Apiaries, and the audited statement of the finances, are submitted herewith.

Yours truly,

W. COUSE,
Secretary.

OFFICERS FOR 1898.

President, - - - - - - - - - M. B. HOLMES, Athens.

Vice-President, - - - - - - - - W. J. BROWN, Chard.

2nd Vice-President, - - - - - - - J. D. EVANS, Islington.

Secretary, - - - - - - - - - W. COUSE, Streetsville.

Treasurer, - - - - - - - - - MARTIN EMIGH, Holbrook.

Directors:

District No. 1 ..... W. J. BROWN, Chard.
" 2 ..... J. K. DARLING, Almonte.
" 3 ..... M. B. HOLMES, Athens.
" 4 ..... C. W. POST, Trenton.
" 5 ..... J. W. SPARLING, Bowmanville.
" 6 ..... J. D. EVANS, Islington.
" 7 ..... A. PICKETT, Nassagaweya.
" 8 ..... JAS. ARMSTRONG, Cheapside.
" 9 ..... JOHN NEWTON, Thamesford.
" 10 ..... F. A. GEMMELL, Stratford.
" 11 ..... W. A. CHRYSLER, Chatham.
" 12 ..... SAMUEL WOOD, Mattawa.

Ontario Agricultural College ..... R. F. HOLTERMANN, Brantford.

Auditors ..... A. E. HOSHAL, Beamsville, and JACOB ALPAUGH, Galt.

Inspectors of Apairies ..... WM. MCEVOY, Woodburn, and F. A. GEMMELL, Stratford, Ass'nt.

Representative to Industrial Exhibition, Toronto ..... A. PICKETT, Nassagaweya.

Representative to Western Fair, London ..... R. H. SMITH, St. Thomas.

Representative to Canada Central Exhibition, Ottawa .. J. K. DARLING, Almonte.

Next place of meeting, Guelph.

LIST OF MEMBERS FOR 1898.

Name.	P. O. Address.
Armstrong, James	Cheapside.
Armstrong, Hugh, jr	Rockton.
Alpaugh, Jacob	Galt.
Aiken, Wm	St. Marys.
Armstrong, John	Streetsville.
Brenton, F	Corbyville.
Brown, W. J	Chard.
Brown, Dennis	Chard.
Best, J. H	Balmoral.
Boomer, A	Lynwood.
Beaupre, M. C	Forestville.
Blanchard, Frank	Athens.
Brown, Charles	Drumquin.
Blais, Adolphe	Glen Sanfield.
Black, Alexander	Sonya.
Comire, A. O., M.D	St. Francois du Lac., Que
Cummer, D. N	Florence.
Calder, J. W	Lancaster.
Craig, Will J	Brantford.
Couse, W	Streetsville.
Calvert, John	Walsh.
Chrysler, W. A	Chatham.
Cox, Wm	Hamilton.
Couse, H	Cookstown.
Darling, J. K	Almonte.
Darling, S. F	Perth Road.
Dickson, Alexander	Lancaster.
Dickson, J	Dunvegan.
Dickerson, E	North Glanford.
Davison, J. F	Unionville.
Evans, J. D	Islington.
Edwards, Albert	Rockland.
Emigh, Martin	Holbrook.
Edmundson, C	Brantford.
Emerson, Wm	Tansley.
Fixture, John	Ottawa.
Farmer, Thos. W	Ancaster.
French, Augustine	North Glanford.
Frith, James E	Princeton.
Fisher, George E	Freeman.
Gamble, James P	Cumberland.
Gemmell, F. A	Stratford.
Gale, Henry E	Ormstown, Que.
Gemmell, John	Lanark.
Heise, D. W	Bethesda.
Holtermann, R. F	Brantford.
Holmes, M. B	Athens.
Hanlon, Geo	Hamilton.
Hall, J. B	Woodstock.
Hoshal, A. E	Beamsville.
Johnston, Thos. E	North Gower.
Kinder, Jos. Dr	Rockingham.
Kelly, Chas	Cathcart.
Kenderick, John	New Dublin.
Lockwood, Burgess	Melbourne.
Lowey, R	Woodrows.
Lemieux, P. E., M.D	Etchemin, Que.
Lepper, M	Picton.
Millen, F. J	London.
Minord, D. W	Martintown.
McLaughlin, Alex	Cumberland.
Mapes, L	Headford.
McKnight, R	Owen Sound.
McEvoy, Wm	Woodburn.
Marshall, J. A	Binbrook.
Newton, John	Thamesford.
Nolan, Wm	Holton, Que.
Overholt, Israel	South Cayuga.
Ortt, Francis	Darling Road.
Pierie, John	Drumquin.
Patterson, R. L	Lynden.
Post, C. W	Trenton.
Pickett, A	Nassagaweya.
Pickett, Mrs. A	Nassagaweya.
Pierce, Moses	Brinsley
Patton, Thos	Westover.
Ramage, Thos	Richview.
Ross, R. B	Montreal.
Robinson, G. E	Hatchley.
Sloan, W. H	Milford.
Shaw, James	Kemble.
Sheriff, G. G	Clarence.
Sparling, J. W	Bowmanville.
Smith, R. H	St. Thomas.
Switzer, J. F	Streetsville.
Stamford, G. H	Hamilton.
Shaver, J. H	Cainsville.
Smith, H. C	Athens.
Selwyn, P. H	Ottawa.
Smith, M. B	Grimsby.
Shultz, H. A	Clontarf.
Shantz, Aaron	Haysville.
Salten, John R	Wingham.
Sibbald, H	Cooksville.
Taylor, Alex	Paris.
Tombs, I	Alexandria.
Thomas, Joshua	Dracon.
Vansickle, Lafayette	Trinity.
Wood, Samuel	Nottawa.
Wismer, Isaac G	South Cayuga.
Watson, Charles	Brantford.
Will, Ramsay	Hamilton.
Wood, George	Erasmus.
Whetstone, Josiah	St. Marys.
Whiteside, R. F	Little Britain.

FINANCIAL STATEMENT.

Abstract statement of receipts and expenditure of Ontario Bee-keepers's Association to December 8th, 1897:

Receipts.	
Balance from last year	$56 17
Membership fees	122 00
Affiliated fees	45 00
Legislative grant	500 00
Total	$723 17

Expenditure.	
Grants to affiliated societies	$180 00
" Industrial Exhibition	25 00
" Western Fair	10 00
" Central Canada Fair	10 00
" Central Canada Fair for 1896	5 00
Periodicals to members	93 25
Executive, revising and freight rate, and other committee expenses	83 25
Printing, postage and stationery	54 05
Secretary's salary	50 00
Treasurer's salary	25 00
Directors' and officers' travelling expenses and allowance for board	136 19
Stenographic report last annual meeting	10 00
Engrossing resolution for family of the late Allen Pringle	5 00
Auditor's expenses	4 00
Miscellaneous	3 00
Balance on hand	29 43
Total	$723 17

We, the undersigned auditors, have examined the accounts and vouchers, as per above account, and report all correct.

JNO. NEWTON,
A. E HOSHAL, } Auditors.

HAMILTON, December 8th, 1897.

ONTARIO BEE-KEEPERS' ASSOCIATION.

ANNUAL MEETING

The eighteenth annual meeting of the Ontario Bee-keepers' Association was held in the Court House, in the city of Hamilton, on Tuesday, Wednesday and Thursday, December 7th, 8th and 9th, 1898.

The President, Mr. J. K. DARLING, called the meeting to order at two o'clock p.m.

The Secretary, Mr. Wm. COUSE, read the minutes of the last annual meeting, which, on motion, were confirmed as read, and signed by the President.

THE PRESIDENT'S ADDRESS.

BY J. K. DARLING, ALMONTE.

Another season has passed by and we are again met together to compare results and lay plans for the future. The past season has been a varied one, the bee-keepers in some localities securing a fairly good yield of first-class honey, while in others there was very little, and in some places none whatever of a first-class article, stored by the little workers.

In some sections there was a small flow of dark honey in the fall, and in others the bees secured barely enough for winter stores, and a good number of colonies have had to be fed. As a consequence prices are firm, and the surplus of last year is likely to disappear before another season opens.

As an Association we can congratulate ourselves on making progress. Some years this advance is not as pronounced as at other time, yet "Onward" is the word, and we are living fairly up to it. If we take a statement made by the President of the Dairymen's Association of Eastern Ontario, at their annual meeting held in Brockville last January, and compare our work with theirs, we will have no cause to feel disheartened. After referring to the vast amount of butter and cheese which Ontario exports to England, he says: "Now, how has this been brought about? In the first place, by organizing a dairymen's convention at Ingersoll thirty years ago this spring with the motto of 'Progress.' For the first fourteen years all that the Association did was to hold conventions, to teach cheese and butter makers while attending, and holding of cheese shows." Surely our record is as good as that, and while we cannot hope to accomplish as much as the dairymen can accomplish, or to increase the industry of bee-keeping to the magnitude of the butter and cheese trade, there is plenty of room for advancement. The work of the Association must be mainly along the line of education, and I think we ought to begin at once to push that branch of our work with more vigor than we have ever done in the past. It is that kind of work that has placed the dairy interest of the Dominion in the front rank as it stands to-day.

There have been no complaints of adulteration during the past year, owing no doubt to the efficient work done in the Inland Revenue Department at Ottawa; and it is my opinion that with the law as it is now, and a proper watchfulness on the part of honey

producers, we will not have much trouble with adulterated honey. It is a matter upon which we can congratulate ourselves that not one of the adulterated samples was traced to a bee-keeper, and that the most of the samples which were adulterated with glucose were traced directly or indirectly to one firm in Montreal, and further that the most of the adulterated samples secured were secured within a radius of that city. This is a matter that ought to be proclaimed from one end of the Dominion to the other, thus allaying the distrust that has arisen regarding pure honey. Only one sample in fifteen was found to be adulterated, and that in a limited area.

Regarding a standard for the specific gravity of honey, we are very much at a loss as yet how to proceed. The fact that the percentage of water in the samples analyzed at Ottawa ranged all the way from 12 to 33 per cent. would show at once that much more must be done before any definite conclusion can be reached. This work we now have before us.

The Foul Brood Inspector's report will be laid before you, and if it is taken up and discussed by this meeting, you will learn that there is a large amount of association work to be done in that field.

The educating of the masses in regard to the use of honey, and thereby increasing our home market, is a matter deserving the attention of this association quite as much as teaching those who wish to keep bees how to care for them.

The programme which is placed before you will provide an opportunity for each one present to contribute something to our store of bee knowledge.

I hope that the friends who looked forward after last year's meeting with the expectation that our meetings in future would be less turbulent and more harmonious and useful, will not be disappointed.

I thank you for the confidence placed in me a year ago in elevating me to the position I now occupy, and I trust that you will assist me in making these meetings both pleasant and useful during the few hours I shall remain in my present position.

ADULTERATION OF HONEY.

By Mr. R. F. Holtermann, Brantford.

A question was brought up at the last annual meeting by Dr. Macfarlane, of the Department of Inland Revenue, in regard to the percentage of water to be found in honey. That was a question of very vital importance to the bee-keeping industry. In travelling about the country I find that there is altogether too much honey which has been taken from the hive at a time when it is not properly ripened, and when it has too large a percentage of water. You remember last year a resolution was passed asking the Department of Inland Revenue to make some regulation, after consulting with the Executive Committee, in regard to that percentage of water.

Now, we know that if honey is taken from the hive before it is properly ripened, or before a proper percentage of moisture has been taken from it, it has not that flavor which is pleasing to the palate, and which it is absolutely necessary it should have, if we are going to develop our markets to the highest possible degree. We are living in a section of country which has perhaps been educated to a greater extent upon this subject than other portions of the Dominion You must remember that this is now a Dominion matter, and if we ask the Dominion Government to do a certain thing it will cover the entire Dominion. If you go into the stores of Ottawa, fall after fall, you find that the honey put upon the market by local men there is largely put up in pickle bottles and corked, and all you have to do is to turn that bottle upside down to see that it is exceedingly thin and there is a large percentage of water in it; and when the consumer puts

that upon the table the result is that he is not pleased with the honey as he should be. Many are not aware as to what the trouble is, and the result is that the consumption of honey is curtailed by putting such an article upon the market. These men who put their honey upon the market before it is properly ripened are simply feeding and living upon the good reputation which the better article has gained throughout the Dominion. The price of honey is reduced by putting such an article upon the market, for it costs more and is a greater expense to produce an article with a heavy specific gravity. I do not think that there are any two views upon that question. Now, it appears to me, it is not so exceedingly difficult. When I first brought this question up in the Department of Inland Revenue, Sir Henry Joly was there, and the Deputy Minister of Inland Revenue and Dr Macfarlane, and they seemed to think that it was quite possible to do that, and if we knew what we wanted they would be prepared to pass an Order-in-Council giving us what we wished There would be no expense; we do not propose incurring the expense of going to the House—it is simply passing the Order-in-Council giving us the Act. Let us ask for only a certain percentage of water to be found in honey; let us put that down upon a safe basis; let us fix a limit, and as we find that is workable, and if it is desirable, we can decrease that percentage, and the tendency will be to educate bee-keepers in regard to that fact; and if the consumer can be taught to judge honey better in that respect, and so be educated in that direction, we will accomplish something. I admit that we should be careful, but I am still of the view that we should work in that direction.

Mr. F A. GEMMELL: Is it that honey should not be allowed to be sold unless it has a certain specific gravity?

Mr. HOLTERMANN: Just as it is with regard to certain other products; there is in the Dominion Statutes an Act which allows the Department of Inland Revenue, by Order-in-Council, to see that there shall not be beyond a certain percentage of certain ingredients in certain things; that covers not only honey but foods generally. What we want is that the percentage of water shall be limited in honey, and let us fix it at such a rate that unless a person puts upon the market something which is absolutely good he will not come up to that law.

Mr. GEMMELL: The only way would be to class it.

Mr. HOLTERMANN: We had better keep it on the safe side.

Mr. J. D. EVANS: Unless there is some very great evil arising in this connection I think we ought to go slow, and I am a little afraid it would give consumers the idea that the bee-keepers were mixing water with their honey, and if that idea gets abroad it will probably injure the sales of honey. How many of the members of the Association find this practised to any great extent? Let us find that out, and if it is not a subject that is worth taking up, and if it is not injuring the sale of honey at the present time, I think I would go very slow in taking any action for fear we create another suspicion as to the honey we produce.

Mr. J. B. HALL: I find in my apiary—I do not know how it is in others—that some colonies of bees will not give heavy honey. I am speaking now of comb honey, not extracted; the extracted would be under our own control. Some races of bees will not give heavy honey, and how are we to get over this difficulty? As far as the percentage of water in our honey is concerned, I am afraid that we will have to kill a lot of our bees—and perhaps it is better that we should kill them. I find such a difference in stocks of bees sitting alongside of each other, feeding in the same field, and, we suppose, from the same food. One gives a heavy, smooth, oily production, and the other is a very thin, watery production. One will keep and the other will not. The watery honey has just as fine a flavor as the other but it deteriorates. It is rather a difficult matter for us to get over.

Mr. HOLTERMANN: Does Mr. Hall ever find that the products that he speaks of is as thin as some of that which he finds upon the market? I am admitting that there is a great difference in the ripeness of honey; that is, one class of bees will ripen honey and it will

not have anything like the specific gravity, while the percentage of water will be much more than in another. But I am talking of an article which goes beyond that and which has a great deal more water in it, and it is that article we want to try and prohibit.

Mr. HALL: That is what we commonly term green. The trouble is to get the specific gravity of water in the green honey. I am speaking of comb honey. I do not know what percentage of water there is in this honey which I have spoken about, but I know that it is not as thick as I would like it.

Mr. HOLTERMANN: The proposition is not at all to deal with comb honey.

Mr. SHUTT was asked for an opinion on the subject, and said: From what I remember of the subject, however, the English analysts have said that the percentage of water in honey is subject to certain fluctuations, within certain small limits, and that usually the percentage of water in genuine honey varies between eighteen and twenty per cent. There have been examples in which the water has far exceeded that amount, however, and I believe there are genuine honeys with as much as twenty-five per cent. of water. So that I presume what Mr. Holtermann is speaking of, and what he wants legislation for, is to prevent the sale of honey when the percentage of water it contains exceeds, say, the latter quantity, twenty-five per cent. I should judge twenty-five per cent. as an outside limit, because I know in England that twenty per cent. is looked upon as a good average percentage of water in honey. You would be quite safe I should say in putting it at twenty-five per cent., and consider honey containing more than that as adulterated. The law you refer to is an adulteration law. When the law comes to treat of the matter it will call additional water, whether left in or added, an adulteration; it could not speak of it by any other term.

Mr. FRITH: I understand from certain experiments which were made at Ottawa that the percentage ranges from twelve to thirty per cent.

Mr. SHUTT: We at the Experimental Farm have done nothing with regard to estimating the percentage of water in honey. The Inland Revenue Department conducted the test. When I quoted eighteen to twenty per cent. I said those figures were the limits, usually, of the percentage of water in honey, but samples of honey had been analyzed that went as high as twenty-five per cent.

Mr. FRITH: There do seem to be some difficulties in regard to fixing the percentage of water; as Mr. Hall has said, he finds some honey with a great deal more water or very much thinner, the consistency is not as great; and as another speaker suggested, if we commence to legislate along this line perhaps it may augment ideas which are now existing against honey in the way of adulteration; and it does seem to me, it would be very hard or somewhat difficult for bee-keepers throughout the country, especially small bee-keepers. They would need to have this honey analyzed in order to find the specific gravity before they could sell it. I think there was something done along this line, or was talked of being done, in the butter business. If there was anything ever done in regard to the butter business we might find out from them how it works.

Mr. R. F. HOLTERMANN: I am very much pleased to have heard Mr. Shutt's remarks. He is a practical chemist, and I think from the view he has expressed that there will be no difficulty in fixing a percentage which would be entirely safe. In regard to the idea that we might arouse certain suspicions in the consumers' minds, I think that can be said of every piece of useful legislation, especially every Act in connection with adulteration. And more than that, that is what we want to do. We want to arouse the consumer's ideas upon the subject. I spoke at the Pure Food Exposition in Toronto the other day, and I made a point of telling them exactly how to judge good honey. The sooner we can do that the sooner we will put bee-keeping upon the right basis—where bee-keepers must produce a good article to get rid of it—and the sooner will we have an article sold upon its merits; so that when a man produces a good article he is going to get the benefit of it, and when a man tries to sell a poor article to a consumer he will get only the benefit of that. It appears to me it is quite within the bounds of practicability. Let us fix that percentage upon such a basis that the honest bee-keeper—the

man who is anxious to produce a well ripened product—will not need to fear the Act one particle, and the rest will have to come to time.

Mr. J. B. HALL: You need not test it; if you get a honey that will weigh twelve pounds to the wine gallon you need not have any analysis. I think Mr. Holtermann will buy that honey for any market he may have to supply; but, I was speaking about the killing of the bees themselves. Of course, in taking extracted honey, you can double the quantity of honey per colony if you take it unripe. I have suffered considerable from these unripe people, for they are very unripe in judgment, otherwise they would not do such a thing. But, there is the greatest difficulty in the bees themselves. This much we know, if you take the comb honey of two hives of bees alongside of each other, gathering from the same field, one will be a beautiful waxy honey and the other will be very thin; if you put a pin into the cappings of the comb it will empty every cell. That is something I can't account for, unless it is the race or stock of bees that does the trick.

Mr. WILLIAM COUSE: What race of bees do that?

Mr. HALL: I was simply talking of the stock, not the breed. Some of them do not ripen their honey, and you cannot get them to ripen it early.

Mr. COUSE: Is there any difference between Blacks, Italians and Cyprians?

Mr. HALL: I am speaking about the bees that we raise from our own Italians, mating with some other outside brands; we find an occasional stock of bees that give us a lot of honey that is not fit to sell and will not keep.

The PRESIDENT: I would like to know how many of the members present have seen the report from the Inland Revenue Department.

Mr. HALL: I found it useful in several cases, so useful that one man has appropriated it.

The PRESIDENT: I think that if the percentage of water as mentioned by Mr. Shutt should be established, a great many persons who supplied samples to the Inland Revenue Department, will have to take them back and ripen them over. We have shown there, and it is pronounced genuine honey, such percentages as the following: 23.50, 25, 21.40, 26.20, 22.80, 26.90, 21.30, 24.90, 24, 21, 25.30, 27.40, not clear; sediment observed, adulterated with starch glucose. That is one of the samples that was traced indirectly to a Montreal firm. As stated there, I think with two exceptions, all the samples adulterated with glucose were traced directly or indirectly to one firm in Montreal. 27.50 from the same city was obtained from another man, but they had obtained their supply from the same men that the other supply was obtained from, and this man obtained his supplies wholesale from the Montreal firm. 27.20, genuine; that was obtained from T. R. Davies; it does not give the name of the producer: crystals; brownish yellow. 23.7 clear; yellow, thick, grossly adulterated with starch glucose; that was obtained from a man in Ottawa who supplied the retailers, and he himself obtained his supply from the Montreal firm. 15.56, 15.68, 15.18 and 17.08.

Mr. HALL: Is that a different analyst, or the same analysis?

The PRESIDENT: It may be a different analyst. The way they did it was to secure the samples and have them analyzed by the analyst that was appointed. If there was any dispute or doubt about it, it was re-analyzed at Ottawa.

Mr. GEMMELL: Are you giving all those samples as tested by the one analyst?

The PRESIDENT: Yes. 15.56, pollen grains; honey mixed with cane sugar. 15.68, 15.18, 15.19, no pollen grains; adulterated by admixture with starch syrup, or glucose. That was a sample obtained in Toronto; it was manufactured or furnished by the West Virginia Preserving Co., Wheeling, West Va. 16.93 genuine; 16.15 pollen grains; genuine; 14 73, 15.21, 16.43, pollen grains; honey mixed with cane sugar. Second analysis, probably adulterated with cane sugar. What I read from this down was all said to be genuine, 16 10, 17.39, 16.99, 16.28, 17 97, 16.94, 17.55, 17.15, 14.86, 15.20, 13.70, 15.20, 32.7, not adulterated; no foreign substance detected.

Mr. HALL: That might be; there is a lot of water in it.

The PRESIDENT: Both of these samples were obtained in Seaforth, Ontario. 27 6, 30.4, 26 8—those three samples were obtained from Woodstock, from Mr. J. B. Hall, bee-keeper; 27 6 was clover honey, 30.4 buckwheat honey, and 26.8 pure clover honey. When I glanced over this, and I well remember what we had been appointed to do as an executive committee, and when I saw men's names connected with it who had a large percentage of water in their honey, I calculated that we had a good deal to do yet before we could arrive at any definite conclusion. 27.2, 26 2, 28.7, 23 8, 30 8, 27 5; the last three samples were obtained from Ingersoll. 25.4 is from Mr. John Newton of Thamesford. 28 2, from Turville Bros., London; the producer was W. Fulton, Brewster P. O. 24.2. I wish to say just here that these all passed as genuine honeys, and there is no disparagement in my reading those names, but I am giving these points just to show that we have a difficult problem before us. 27.5, 25 06; these two are from Stratford, A. Beattie & Co.; they were not the producers. The next three samples are from Tilsonburg, 29.1, 29 7 and 26 5; two from St. Thomas, H. H. Waddell and S. Pettit.

Mr. GEMMELL: The honey which you mentioned from Stratford was not my honey, but my honey was sold there.

The PRESIDENT: Then there was one sample obtained from Winnipeg that had 14 62 percentage, adulterated with cane sugar. Down towards the bottom, after getting through with Winnipeg, there is R. F. Holtermann, Brantford, from thistle and basswood, 20.28, crystalized.

Mr. HOLTERMANN: I sent to Dr. Macfarlane two samples of honey, one, the thinnest, that I thought ought to be allowed upon the market and the other one better ripened; he got them from me and he knew that I sent them, and I sent them purposely.

The PRESIDENT: From clover honey, from the same gentleman, 27.10; this is marked as though it was crystallized.

Mr. HOLTERMANN: Yes, it was granulated. The crystallization has nothing to do with it, that is simply granulation.

The PRESIDENT: The first thing was to have those that had the matter at heart and wished to have a good pure article put upon the market, to have their honey tested. I tried last year when the matter was up to have it tested according to the specific gravity.

Mr. HOLTERMANN: Where does the marked distinction come in? You propose specific gravity and we propose a percentage of water.

The PRESIDENT: If we have to take the percentage of water, we cannot find it without having the honey analyzed.

Mr. HOLTERMANN: It is exactly the same thing; there is no difference between the two.

The PRESIDENT: If we take the specific gravity, any instrument that will test specific gravity for syrup will test the specific gravity of honey, and every man can test his own.

Mr. HOLTERMAN: We might ask Mr. Shutt if the two propositions are not identical.

Mr. SHUTT: There is only a little misunderstanding between Mr. Holtermann and Mr. Darling; of course, the results are identical, but the means of getting at it are different. Mr. Darling means to say that it is quite within the means of every bee-keeper to test his own honey by means of the specific gravity test, but it is not within his means and power to test by determining directly in honey the percentage of water. The results would be the same, but one the bee-keeper can do and the other he cannot.

Mr. HOLTERMANN: There is no difference, the result is exactly the same, and Mr. Shutt admits that. If he reaches a certain specific gravity, then he must reach a certain percentage of water. An Order-in-Council allows you to limit the percentage of certain matter, but an Order-in-Council could not be passed saying honey shall have a certain specific gravity. Dr. Macfarlane told me that. We want to catch these forty per cent. boys; that is what we are after.

The PRESIDENT: I was just saying that if we take the specific gravity test, every bee-keeper could test his own honey, and he could ascertain to his own satisfaction the amount of water that it contained. If we take a sample of honey that will test fourteen and a half pounds per gallon, imperial measure—I have an instrument and have tested it at home, and it is a pretty stiff sample of honey—and add twenty-eight pounds of water to it, we still have a mixture that will weigh thirteen and a quarter pounds per gallon. That is the result, and any person who has gone far enough in arithmetic can satisfy himself, if he tests his honey by the specific gravity test, as to the percentage of water it contains over and above what it ought to contain; if he cannot work it out, there are certain tables which he can get. The instrument which I spoke of registers just like a thermometer, and he knows whether his honey is heavy or not.

Mr. HOLTERMANN: Representatives from this Association should co-operate with the representatives appointed by the Department of Inland Revenue at Ottawa, the Dominion Experimental Farm and the Ontario Agricultural College at Guelph, and that that committee should try to secure a dozen or more samples of honey capped in the hive, and the percentage of water should be recorded, and that they report to this meeting a year from now. That will give us somewhat of a data to work upon, and I believe we will be acting in the right direction.

Mr. FRITH: In regard to this matter, it is going to be a very difficult one; in the first place, we have really no such a thing as honey. I do not know whether that is new to bee keepers or not, we have no element by the name of honey.

Mr. HOLTERMANN: We have no element by the name of pork or butter.

Mr. FRITH: But we have a compound made of different things, and that varies in different honeys in proportion; the proportion of these things mixed together varies in honey not only from year to year, but from locality to locality; these specific gravities all vary, it is greater in some and less in others. Water has one specific gravity, glucose has another, grape sugar has another and cane sugar has another; and these are all in honey. I do not see how we can arrive at this matter; by the report of the Inland Revenue Department the percentage of water varies from fifteen up to forty-two per cent.

The PRESIDENT: That is a mistake, thirty-three per cent. is the highest.

Mr. FRITH: I do not know how we are going to arrive at these figures; I am not a chemist.

The PRESIDENT: That forty-two per cent. is of glucose.

Mr. FRITH: There is honey that is produced by the best bee-keepers in this Province and perhaps in Canada, in which the percentage of water was high and the specific gravity low.

Mr. HOLTERMANN: That is a mistake. I find in all these tests here that the percentage of saccharine matter varies according to the specific gravity.

Mr. FRITH: Do these experiments which have been presented to us to-day vary in accordance with the water? Can you say fifteen per cent. of water will give a certain specific gravity?

Mr. HOLTERMANN: Very closely. I would like to ask Mr. Frith one question. That objection in regard to the percentages varying, holds good to even a greater extent in milk, and there is legislation in regard to milk and why shall we not have it in regard to honey?

Mr. FIRTH: We may get it; I hope we can.

Mr. M. B. HOLMES: Mr. Shutt has told us that the specific gravity test is the practical one, and the same thing as analyzation, and that being admitted it does seem to me, and I do not want to go on record as being opposed to everything good, that an Order-in-Council regulating the quantity of water admissible in honey might easily convey a wrong impression to the world. Would not people be inclined to question something like this: "Oh, we didn't know that you put any water in your honey, and we see

an Order-in-Council stating just how much water you will be allowed to put in your honey." Might there not come a danger just there? And then another point, inasmuch as it is pretty generally admitted that there is a very great difference in honey that has been sealed over, might there not be a danger of treating some one unjustly by an Order-in-Council?

Mr. SHUTT: The fact that the specific gravity test gives the same result as to the percentage of water needs some qualification. If the honey has had no sugar, glucose or syrup added to it, then the specific gravity test will give you the percentage of water, or the percentage of honey sugar in it; that is, supposing the only adulteration suspected is that of water; but, you can easily understand, that if such materials as I have mentioned had been added to honey to adulterate it, then the specific gravity would not necessarily give you the percentage of water in the honey. If you are not looking for the percentage of water only, and you can assume that the rest of the honey is genuine as prepared by the bees, then the specific gravity test will give you approximately the data that you wish, the same data that you would obtain by analyzing the honey and ascertaining the percentage of water. There were one or two remarks made by Mr. Darling that I should like to correct, for I must not go on these minutes as being misunderstood. When I was spoken to with regard to this question I do not speak as an authority, and I mentioned the fact that I was not quoting from memory, and that I had not come prepared to speak authoritively upon the subject. Mr. Darling misunderstands me when he thinks I suggested a standard. I am of opinion that we have not sufficient data as yet to establish a standard. I said that I believed in England they held that genuine honeys contain somewhere in the neighborhood of from 18 to 20 per cent. of water, but that there were genuine honeys on record which ran as high as 25 per cent. What I say is, that if there are sufficient data to show that genuine honey does not reach beyond a certain limit, then legislation may fix that limit by law. It is a question of chemistry entirely. It seems to me that the data that has been put forward in that bulletin constitute our only collection of Canadian data on this subject; it is an extremely valuable investigation, but it has not been taken up with the point in view that we are discussing, and it probably therefore will be highly desirable to have such a committee appointed as Mr. Holtermann has suggested, to secure samples of genuine honeys from various sources over large geographical areas, at points distinct from one another, and samples of honey elaborated by different races of bees, and from different kinds of flowers, basswood, clover, etc. The analysis of these samples would show if any conclusion can be arrived at, if any deduction can be made, as to this question of the percentage of water in genuine honey. Would there be any injustice if a limit were fixed? You must know that milk fluctuates much, and there are on record plenty of cases of genuine milk which would be accounted adulterated by law. If milk is sold in a city with two and a half per cent. butter-fat and eight per cent. solids not fat, the law says that is adulterated; the man swears that the milk is just as it came from the cow; the law says, we cannot help that, the law has fixed a standard and the milk falls below it. I mention such a case as an illustration. If you take the milk of the whole herd it would come up to three per cent. of fat, the limit, at least, but isolated cases might very occasionally fall below it. In regard to that word "genuine" in Mr. Macfarlane's report, I am not here to interpret it; I hesitate to do it. But I doubt if he used that word "genuine" with respect to the percentage of water in that honey. What I think he meant by that word was that it had not added to it glucose, syrup, cane sugar or other saccharine matter. I think the idea he wished to convey was that no extraneous sugars or sugar compounds had been added to that honey. I think when he comes here, and you ask him the question, he will say that was really the idea that was uppermost in his mind when he used the term.

Mr. J. B. HALL: It means that the honey is genuine; that it simply has water in it.

Mr. GEMMELL: I think that is generally understood, that it has no foreign admixture put in it.

Mr. SHUTT: If you read that bulletin you will see that Dr. Macfarlane covers this point of water. I am not insinuating anything, but I do say this: that Dr. Macfarlane

was very guarded, because in that bulletin you will see that he says he could not, from the data that was at hand, come to any conclusion as regards the percentage of water. He did not feel himself able, from the data on hand, just to say what percentage there should be, and if he had not come to any conclusion as to that, it is certain that he did not intend that to be included by the word "genuine."

Mr. GEMMELL: Does Mr. Holtermann think the honey he saw in Ottawa was adulterated with the addition of water by those retailing it, or was it the product of those who harvested it?

Mr. HOLTERMANN: I have seen it from year to year, and it is bottled and corked in pickle bottles, and I have every reason to believe that it was unripe when put upon the market, as received from the producers. Those samples were not taken particularly with a view to the percentage of water, but simply the foreign matter added. If we get these samples from all over the country, or wherever we see fit or wherever they see fit, then we will take only the capped honey, and in that way we will begin to get some sort of data in regard to that question, which will be something, I believe, which has never been done before.

Mr. GEMMELL: There is a great difference in the specific gravity of different honeys. In regard to 18 and 20 per cent., genuine honeys run from 18 up to sometimes 30 per cent., and if we can fix a standard of say 25 per cent., I do not know after all that there would be any particular harm in doing it. As far as the percentage of water is concerned, the public know that there must be water in honey.

Mr. SHUTT: If you wish to obtain a standard, samples of undoubted purity would have to to be analysed in comparatively large numbers. It is a first requisite that these should be reliable samples, and to get such they should be collected by thoroughly conscientious and expert men. The samples must then be handed over to the chemists. I might say with confidence that the Dominion Minister of Agriculture is anxious to assist you in any way possible, and for my own part we shall be very glad to co-operate with the Inland Revenue Department, and make such analyses conjointly. If you induce the Inland Revenue Department to take up this matter I think I might, without any hesitation, say we would do our part, providing the work was not too great.

Mr. HALL: There is one thing with regard to the difficulty of getting data. One year we get honey and the second day after it is gathered it is fit for consumption; another year we will have wet, drizzly, old country weather and we cannot get honey that is fit to put onto the market, it makes no difference what we do. If this honey is gathered and presented for analyzation in a wet season the percentage will be very different to what it would be in a dry season.

Mr. SHUTT: Are there any data to show that?

Mr. HALL: I am speaking as a practical apiarist; I know nothing about chemistry. As a practical apiarist I say that in a good basswood flow and a very hot dry season you get your honey two days from the time it is gathered, fit to go upon the market as a first-class article, and if you get a wet season you may keep it four weeks or six weeks and it is not good then. I do not know of any data. I will second Mr. Holtermann's motion.

The PRESIDENT put the motion which, on a vote having been taken, was declared carried.

MANAGEMENT OF BEES IN SPRING.

BY J. W. SPARLING, BOWMANVILLE.

The spring management of bees should commence the previous autumn. Though this may sound like a Hibernianism, yet it is true that upon the condition in which our bees go into winter quarters, and upon their wintering, depend the profit of the next season.

They should be strong in numbers, well supplied with stores, and have a young queen. These conditions being present, with reasonable care in wintering, spring dwindling need have few terrors, and necessary spring management is reduced to a minimum.

The matter of having young queens I am coming to regard as of the first importance; a failing queen at this time meaning an unprofitable colony for the season. I am aware that it is generally held as being the better plan to let the bees do their own superseding. This may possibly be correct where Italians are kept, but where the bees are of mixed blood, as is the case in most apiaries, there are too many failing queens, and consequently unproductive colonies when the superseding is left entirely to the bees, and I would be disposed to advise replacing all queens after their second season.

Setting out the bees in spring is something to which I find myself looking eagerly forward. While this may seem a simple matter yet it is fraught with some perplexities. For instance: Shall we return each colony to the stand occupied by it during the previous fall? Shall we set them out in irregular order and only part of them at a time? Or shall we put them out without regard to previous position, in regular order and all at once? I don't know that it is the best, but for me I find the last mentioned the most convenient way.

When shall we put them out? I do not deem it wise to defer putting out the bees until late in the spring; opinion seems to be veering around to early setting out. We used to be told to leave the bees in until the soft maples bloom, but that is usually too late, for if left in the ordinary cellar so late, they will suffer more loss of vitality and numbers than would be the case if they were set out at the end of March or beginning of April, as soon as the weather seems to promise to remain fine for a few days.

The bees being out, our first care is to see that they are well supplied with stores, as a shortage at this time means a heavy loss in the returns. I usually, in setting out the bees, mark the light hives with an entrance block, and later give them combs of honey saved over from the previous fall or from colonies that have died during the winter, and I will admit I usually have a few. Lacking the combs of honey I prefer to fill combs with extracted honey thinned with hot water. All the examination the heavy colonies receive at this time is generally limited to raising the front of the hive and glancing up between the combs.

As the bees are now on their summer stands the question arises: To pack or not to pack. I would say do not, as it will not pay for the labor. This conclusion I have arrived at from comparing results from my colonies wintered outside which are left packed until about time to put on supers, and cellar-wintered ones which are never packed at all.

Some eminent beekeepers have said that the bees by their clustering form a natural hive, and so retain the heat. This, I believe, is largely true; nor do I think we can aid them to any great extent by division boards or cushions. While I believe this to be so, in practice I endeavor to keep them as tight as possible on top. To aid in this direction I spread a newspaper or two on the thin board which is over the bees, and crowd down the cover. The covers telescope half an inch over the hives.

This is generally all I do until first bloom appears, during the season of which I like to clip my queens, as I consider it advantageous to have all queens clipped, and think this the best time—before the hives get too full of bees. Mr. Hutchinson says he was brought to favor clipping by having so many five dollar arguments in its favor, meaning absconding swarms.

If spring feeding is at any time profitable, it is between apple bloom and clover, and, to quote Dr. Miller, "I don't know," but think if one has any low-priced honey it can be used to advantage at this time.

Another matter which rightly comes under spring management is spreading brood to increase the colonies' strength. Although I fancy it is but little practised, yet by a careful person it may, I think, be done to some advantage. But the novice as a rule will be safer to leave it alone, and the beekeeper with many colonies has not usually the time to give to that which is at least a matter of doubt.

Mr. HALL: This is the nearest thing to the best method of spring management that I know of. I can endorse him in putting his bees on his old stand. I have put out, perhaps, twenty hives at a time on different stands, and in about an hour after we had set them out we found them locating themselves twenty-five or thirty feet from any other stand. What are they doing there unless you come to the conclusion that they are looking for a home? When I found that out I put my stock of bees on the stand it belongs to. They stand in blocks of four, and are all marked on the front of the hives, north-west, south-west or as the case may be. If you mix them all up you have lost all track of your bees. I believe in putting them on the old stands. As to the time of putting out I must say I have to go back on these soft maple bloom fellows, and I want to put them out on the first of March if they can fly.

Mr. SPARLING: The season with you is a couple of weeks earlier.

Mr. HALL: I am simply speaking of my own locality. A number of years ago I put out a lot on the first of March; the thermometer went down ten degrees below zero after that, and I pitied the poor things, and they laughed at me; and at the honey flow they were two or three weeks ahead of the other fellows. It does harm to put them back in again. As regards clipping the queens, I have kept bees since 1873 and I am a clipper, and the older I get the clippier I get. I cannot run and I cannot climb, and the bees have to come home. Mr. Sparling has got the right idea, too, in spreading brood. The bees know better about that than you do. Do not open a hive; it makes no difference if they have not any supplies. Do not open a hive until fruit bloom. Remember that; that is worth more than anything else in Mr. Sparling's paper.

Mr. GEMMELL: You said you numbered your hives; why do you not number your stands?

Mr. HALL: I do not number my hives. There is a peg put in the tree along side of the stand lettered A, B, C, and so on.

Mr. GEMMELL: I moved some bees from the country into my yard and I wanted to put those bees on the same stand, and I numbered the stand and I numbered the hive, and when I take them out in the spring there will be no trouble I wanted the old hive on the old stand. With regard to this spreading brood, Mr. McEvoy will tell you more about that if he is here. He has visited a great many apiaries throughout the Province and he has seen quite a bit of spreading brood. I have accompanied him on a great many occasions when looking out for foul brood, and I have seen some of the most awful messes you ever saw on account of spreading brood. If you do it be on the lookout. In nine cases out of ten you will do more harm than good.

Mr. DICKENSON: The mode I adopt is to draw a plan and mark the number of hives, 1, 2, 3, etc., and put them in the cellar in that shape, and the plan will direct where the hives should go. With regard to spring packing I like to have a large outside case to put over the hive.

Mr. HALL: Try a few next spring and let the sun get at them.

Mr. DICKENSON: The expense is just in once getting the cases. I have got two cases, one is black, it is double. I have got another, just simply a rough board case which goes over the hive in the spring. I would like to discard that system of spring packing, but I find that when I have any surplus honey that is not saleable I would like to feed it back at the proper time. I like to have them nice and comfortable on top, and, therefore, I find the spring case, or at least what I use, comes very acceptable. One cover is just made of rough boards and the other is a little more expensive, but there is one feature about it, that there is only the one expense; divide that up into ten years and the expense is small, and the case is as good at the end of ten years as the first year, and I think there is quite a benefit from spring packing.

Mr. GEMMELL: Why don't you pack in the fall?

Mr. DICKENSON: I have tried it, but I think I am more successful in the method I have adopted. I think likely that there are men who follow the business who are very

successful at out door wintering, but I have not been successful. I am very successful with cellar wintering, and therefore I follow what I am most successful with.

Mr. SPARLING: My observation would lead me to believe that the empty case put over as you speak of, in the spring, would be worse than useless.

Mr. DICKENSON: We all know that there are little features in connection with the business all through that a live man will be equal to. I simply go along on a nice sunny day and I take off the cover and let the sunshine in. They are kept covered when the thermometer drops so low that I think there is nothing beneficial to the colony to have it face that. Sometimes in the spring we will have a week of extra warm weather, surprisingly warm weather, and breeding is going on; and sometime after that we again have a low temperature, and it is to provide against that that I have the spring packing.

Mr. A. PICKET: The spring has much to do with the management of bees. I would ask what time in the fall do you usually put them in. I have learned from some bee-keepers that they have just recently put theirs in; and I would like to know whether any of you leave them out late, say to within a week of the present time, or put them in earlier?

Mr. SPARLING: Mine have not been in a week; they have only been in since last Thursday.

Mr. DICKENSON: I put mine in the cellar the first of November, and they have been very quiet ever since. I am south of Hamilton in latitude.

Mr. SPARLING: At this time of the year there is no brood in the hives; the bees cluster together closely and there is no danger of the brood being chilled, and they require very little protection. I am a little north of this section.

Mr. FRITH: Take the parallel of Toronto, and you have a great many more sunshiny days north of that, than you have south of it. South of this we only average about three sunshiny days out of twenty. North of it, in proportion to the distance, you average a great deal more, and the same with regard to the spring. It makes a great deal of difference.

Mr. DICKENSON: I think some men will get wrong views unless the locality and latitude is mentioned in our journals when describing experiments. One man might have success in one locality, on one system, and another man may fail with it in a different locality.

Mr. J. D. EVANS: What is the reason attributed to the benefit of putting the bees out early? Do they breed quicker?

Mr. HALL: Winter bees in the cellar and open them in the spring, and you find they generally have no brood. There are exceptions to the rule. When they come out for a fly they get a drink, and when they get a drink they thin the honey, and when they thin the honey they feed the queen, and she deposits eggs, and when the larvæ comes to maturity you have bees. By putting them out on the first of March the eggs are laid, and the bees are kept in there for three weeks, and they cannot fly anymore; and by that time there is a race of young bees ready to take the place of those that fly, and they gather water and feed, and the colony goes on prospering, and that is why, as I told you at the commencement of the honey flow, they will be two or three weeks ahead of those that are kept in three weeks longer.

Mr. HOLTERMANN: This spring we did something which I never like to do. I examined the colonies, the brood chamber, from time to time during the spring. With regard to early setting out, year after year we have set out earlier, and earlier; and I am an advocate of setting the bees out just as quickly as they can get a good safe fly. We have kept examining. We set out so many colonies on March 1st, we set out so many a little later, so many a little later still, and so on; and when we went through those colonies without looking to see the dates they were set out, we could tell by the condition of the brood chamber just when those were set out. For instance, on the first of March, we set out ten colonies, they had a good fly and either through activity or getting water,

whichever you like or whatever the truth may be, the queen began depositing eggs. Then if they did not have a fly for a whole week she ceased brood rearing, she ceased producing eggs; and then when another sunshiny day came they had another fly, and she began laying again, and so on until the brood chamber was extended. I am not prepared to say as to whether spring packing is a good thing or not. I do not know, but I am inclined to believe that by giving top protection, and not side protection, the colony is more likely to be stimulated, and rise into activity more quickly than if there is much spring packing, but I do not know whether that is the case or not.

Mr. McEvoy: What about these that are out all the time? In this part of Ontario, south of this line, I think they ought to be out all the time. Now, for my part, I like the bees south of this line packed in summer stands; they come into spring stronger, and they will give a large yield of honey, taken on the whole, if properly done.

Mr. Holtermann: I am not prepared to say whether that is correct or not. Mr. Pettit used to winter outside, and Mr. Pettit winters inside now. I have no hesistancy in saying that there is no one who can beat him in wintering bees any way; and he says he gets better results from the inside wintering than from the outside. In regard to the outside wintering, very early in the season when we dare not set our bees out, the sunshine comes to arouse the bees, and they begin brood rearing much earlier.

Mr. McEvoy: We have a man here, that I know for a fact, winters his bees on summer stands, and from forty colonies he took eight thousand pounds of honey and increased to sixty-two colonies; if there are any here who can beat that, let us hear from them.

Mr. Dickinson: You save five pounds of honey on every colony by wintering inside. If I was going to winter out doors I would simply require my colonies to weigh five pounds more than what I can risk them safely at by putting them in the cellar. That is, at eight cents a pound, forty dollars on a hundred colonies.

Mr. McEvoy: Take it as a general thing, Mr. Dickenson is right, but you can pack these bees and put them into order for going through the winter, by giving them sealed stores, and they actually use just as little, if not less then if wintered in the cellar.

Mr. Holtermann: A great many put their bees out of the cellar too late as a rule, and it is not fair to compare that kind of wintering with outside wintering.

Mr. McEvoy: As a rule, yes; you are right.

Mr. Dickenson: I do not find the spring case gives much trouble; my man and myself can go over one hundred colonies in a very short time. I have two kinds of cases.

Mr. Gemmell: Try some without any case at all.

Mr. C. W. Post: I believe it is possible to pack a colony of bees in the spring, and make a perfect little refrigerator of the hive. However, it can be done intelligently, and I believe it is a good thing. I think your packing reuqires to be about two inches or three inches thick, and put on very solid and allowed to touch the top of the hive, and have the top lid painted red or some dark color, and it will store the heat of the sun and retain it through the night. I like, for top packing, to use dry forest leaves packed very tightly, and at the bottom old wollen cast off clothing or something of that kind, and I think when packed in that manner it is away ahead of not packing them at all or packing them loosely.

Mr. Hall: Are these cellar wintered?

Mr. Post: Or outside, either. I have a three inch cushion on mine that I winter outside, and the packing comes tight against the top of the lid, and the lids are painted red.

Mr. Hall: How many stocks of bees have you?

Mr. Post: Three hundred and twenty-five.

Mr. Hall: If your packing was loose all around, and not tight, you would find that they wintered better; you would have more honey than you get now, although you get a lot.

Mr. POST : The sun on bright days in the winter will warm them up.

Mr HALL : But there is sufficient warmth of themselves if you keep it there.

Mr. POST : It is too much like a refrigerator in my way of thinking.

Mr. HALL : Not if it is loose.

Mr. MCEVOY : These men come from different places. In warm weather, let the sun straight at them in the spring, and it is as Mr. Hall says.

Mr. J. ARMSTRONG : When would you take the bees out of the packing provided they wintered out doors ?

Mr. GEMMELL : I take mine out between the 24th May and the 1st June.

Mr. NEWTON : I take mine out between the 25th May and the 1st June, and I have a neighbor about fourteen miles from me who never takes his off, and he always has a good crop.

Mr. J. H. BEST : I am very much interested in the discussion that has taken place. In our locality we generally winter outside. I have never attempted cellar wintering, but I find as a rule that leaf packing, as was mentioned here by some, is superior to some other things that have been used. I have taken chaff and other different materials for packing, but I find forest leaves answers the purpose better than anything I have used.

Mr. ALPAUGH : After putting the bees out in the spring my experience is that it would be better to pack them from September until the time they are put in. What I have found is this : once the cold nights come on, the moisture of the bees will condense on the honey on the outside of the combs for instance, and it will thin it if there is any uncapped—in fact, it will thin that which is capped—and that honey, before the spring, will have time to sour and it will kill your bees. Now, packing in the spring is no good for that ; if your honey is all right your bees do not need any spring packing. If they have good honey, that has no moisture in connection with it, that is fairly thick and ripe, they will spring all right, almost surely, but the trouble comes in the honey getting damp in the fall before they are set away or before they are winter packed outside. When I pack bees outside I take them as early as I can get them in September. I packed my bees this year in September, and I have got leaves enough to pack another hundred colonies next year, that I can pack long before they fall. I could not use those leaves at all just then, but they were handy and I gathered them quite easily. It is an uncommon thing to look ahead, but sometimes you have got to do that in this country. There is another thing which is mentioned in the fore part of the paper. He says to have your colonies well stocked. I want to ask him how are you to do that, or what is the necessity for doing it ?

Mr. SPARLING : Do you object to have a strong colony of bees ? With me, we never fail to have a fall flow of honey.

Mr. ALPAUGH : My experience is the reverse of yours. The bees with me that have wintered the most successfully, have been those that have been rather weak, with a young queen and plenty of stores. I have removed my colonies in the fore part of September, taking off the top storey and setting it down on the old stand just to catch the bees that return from the old colony when it was removed ; and when I got them there I would destroy them. There was nothing left in the old colonies but young bees, and I found those colonies to grow into the finest colonies I have ever had.

Mr. HOLTERMANN : What about those in which there are no young bees. Would you do that if you had almost all the young bees in one and the old in the other ?

Mr. ALPAUGH : That does not occur very often. You will find in removing your hives at any time the bees will not all go back, there will be a sufficient number always left ; they seem to find out in time, that they are in a new place, and commence to mark the location after a number have gone.

Mr. HOLTERMANN : When you winter those colonies do you contract the brood chamber?

Mr. ALPAUGH : I never spread brood, and never contract a brood chamber.

Mr. HOLTERMANN: First be careful and have your stores well ripened in the fall of the year and not absorb moisture. You have not got the bees there to cover all those stores, and whatever moisture they expel is likely to be absorbed by the honey and prove injurious.

Mr. ALPAUGH: You reduce that if you pack your bees early enough before the frosty nights come.

Mr. MCEVOY: For years I have made it a rule to have strong colonies, and those that were not up to the mark I united them.. If they were not strong I would unite some of them, and I have come out with better stocks in the spring by going into winter quarters with good strong colonies.

Mr. GEMMELL: Just tell them now what you do with the bees when you double them up. How do you keep them from breeding when it comes toward spring?

Mr. MCEVOY: I go to a great deal more work. I make it a rule to remove the comb from the brood chambers, and to give them sealed stores from the top stories and crowd them so that the queen cannot lay until further on in the winter, and the bees are at rest; and there is no larvæ. These bees winter better, and there are more bees in the spring because they are not worn out by feeding larvæ during the winter.

Mr. ALPAUGH: In regard to these old bees, I find they keep dying off in wintering outside, if there is a chance at all; it is those bees that clog up your hives, and if the hives are wintered properly they ought to be thrown out. Very often good bees lose their lives in that way. I found that while some colonies went into the cellars strong in that way, they came out very weak, and I could account for it in no way, except that the good bees were lost with the dead ones, and that was what caused me to remove my hives to get rid of the old ones.

Mr. HALL: I concur in what Mr. Alpaugh says. In strong stocks, for instance, rather than winter them, we shake them off into the hive, and take their combs away and let them die. We simply do not want any more bees in the hive than what are there. If there are enough bees to take care of the queen through the winter, and enough to live on until they get another little start in the spring, we do not have to feed so much honey; and they do not have to die on the bottom board. Medium colonies of bees are the ones that give me the honey the following season. The large number of bees very often consume all the honey in the spring in the cellar and are no use at all. A small quantity of bees with a vigorous young queen cannot consume the honey, and therefore when they are put out there is food to feed on and multiply, and feed the babies. In the fall I never save any bees. If I want to destroy a stock of bees they are destroyed; I do not put them with any others.

Mr. FRITH: This question was pretty well threshed out in the *North American Bee Journal* some years ago, and the very best bee-keepers all over the northern part of the continent seemed to have agreed that what we require is young bees all through, the conditions being proper, and that old bees are useless. I found it in my experience as Mr. Alpaugh has. If you have below a certain number—if you have only a few dozen—you cannot expect them to keep up the heat nicely to supply vitality. If you have a good colony of young bees in going into winter quarters, and good stores, there is no difficulty in wintering either indoors or outdoors. I think that was a decision which was almost universal.

Mr. MCEVOY: I have no doubt if we took a vote on it here that nine out of ten would vote that the medium colonies would be the best. Now, it depends a good deal on how they are prepared. Mr. Hall said that the large ones did not do so well put in the cellar. I will agree with him. You take them just as they come in the fall; you take a rousing strong colony with plenty of room in the centre of the hive, and a young queen, and put them in the cellar, and that queen has got room to start laying, and there is abundance of bees to keep it warm and that will break the cluster; and just as soon as it breaks the cluster, brood rearing goes on, the old bees wear out rapidly and a medium colony will head that off. But have these combs sealed, stop the queen laying, and these colonies will come out ahead.

Mr. HOLTERMANN: Do you propose taking the younger bees and having a medium to even a weak colony, or would you say the same thing if you take a colony just as it is, old and young; would you then take a medium or fairly strong colony in preference to a weaker one.

Mr. ALPAUGH: I would just as soon have quite a weak colony as a very strong one. You know what it is like about the time you have removed your old hive; that is the kind of colony I am speaking of.

Mr. HOLTERMANN: Mr. Sparling suggests feeding back the honey to the bees in the spring under certain conditions. From what I know of what has been done in different parts of the Province, bee keepers want to be exceedingly careful about feeding back honey. There are many who think they have no foul brood in the yard; they feel reasonably sure about it; they think they are quite safe and sometimes they are not. If they take extracted honey from one or two colonies that have the slightest touch of that disease, through that honey which they are about to feed back they may affect a great many colonies in the apiary. I always think that feeding back should be done with a great deal of caution.

Mr. GEMMELL: If you do not feed honey you will have to feed sugar syrup, and somebody will kick up a row.

Mr. HOLMES: With regard to the matter of feeding back honey, Mr. Sparling quotes from Dr. Miller in support of it. In so far as my experience goes in feeding, I have never ventured to feed back the cheaper grades of honey to dispose of it in that way. There comes in a little bit of danger, in as much as the bees from the other colonies passing up along often get a smell of the honey, and they invite their fellows to come in and take something, and they go away without paying for it; and it seems to me there would be a danger of incentive to robbing; that is my experience in feeding. My experience is to feed a sugar syrup made from the best granulated sugar. You can then get a feed that is very cheap, as cheap as the cheaper grades of honey, and it seems to me to be a cheaper and better plan.

Mr. HOLTERMANN: I do not think it has the same stimulating effect as honey.

Mr. DICKENSON: What do you do with this unsaleable honey, if you have two or three hundred pounds of it? If this feeding is done at the right time in the evening you have no trouble.

Mr. GEMMELL: By boiling it?

Mr. DICKENSON: Certainly.

Mr. W, J. CRAIG: Do you encourage breeding late in the season in order to secure young bees for the winter?

Mr. ALPAUGH: I have never encouraged fall brooding. There are always plenty of young bees by the time the flowers shut down. I have kept bees in quite a few parts of the country now, and I have been where there is practically no fall flow at all and I always found there was plenty of brood in my hives up to September; there seemed to be plenty without breeding and without stimulation.

The PRESIDENT: Some years ago in preparing my bees for putting them away in the cellar—I think it was in October—there were three or four colonies I thought I would look at again, and I found patches of brood as large as my two hands. I made up my mind that those colonies would not be of much service in the spring; but the fact was, they came out the best and the strongest of any I put away. I put brood away that had not hatched out. I have heard it said that young bees must have a fly after they hatch out, or they will cause trouble in the hive. I know they had not hatched, because the brood was sealed over when the bees were put in the cellar, and they caused no trouble, whether they died or not, but they came out dry, clean and strong.

Mr. MCEVOY: In your case the queen had slackened up in laying, she had not continued in brood rearing right through.

The PRESIDENT: They had been breeding right through the fall.

Mr. McEvoy: They did not follow it up.

Mr. Shutt: I would like to ask information as to whether there is any difference noticed in the strength of bees that are fed on the one hand with honey, and on the other hand with sugar syrup made from ordinary cane sugar. There is a very interesting question involved there; bees, like all animals, require a certain amount of nitrogen to replace the waste of their tissues; that is absolutely necessary. Honey does not contain any nitrogen, but honey does contain a certain quantity of pollen, and I take it that the small but necessary quantity of nitrogen that the bees require to keep up the waste of their tissues they get from the pollen. Of course, the sugar of the honey is burned by the bee with the aid of the oxygen of the air they breath. The burning of it is similar to the burning of a piece of wood in the stove, and produces heat and energy within the bee. At the same time, there must be a small quantity of nitrogenous substance to keep up the waste of the tissues, and I wish to ask as to the source from which bees obtain this nitrogenous material.

Mr. Hall: This nitrogenous matter is deposited by the bees and protected with honey, with a cap over it to preserve it until the following spring, to use for the building up of the tissues of the old bee, and also for the raising of the young bee. One year we took more honey from our bees than we should have taken, and the following year we had to feed them bright and early, and we fed on West India sugar. I prefer common West India sugar for feeding up in the spring to any material I can find. Refined sugar is a very inferior article, it is not nearly so good as honey for that purpose, and honey is not so good as common West India sugar. I do not know the chemical analysis of sugar, but I know that is a fact. They do not need to have the pollen, although it is there; they put pounds of it away in the summer and reserve it for the spring, and they can mix this with the syrup that we give them, but I, for one, do not want to feed until after the fruit blossoms, I do not want to give them an ounce.

Mr. Gemmell: Of course there is pollen in the hive, and it makes no difference what you feed them, they use this pollen anyway.

The President: I think there is a misunderstanding about the position taken; in all honey there are more or less grains of pollen floating, and it is these floating grains that Mr. Shutt is supposing perhaps have a stimulating effect upon the bees, not that which they store in the cells for future use.

Mr. Shutt: I have already said that I am not here as a practical bee-keeper, but I am interested in this as a physiological question. Supposing the bees have access to no other feed; do you, as practical bee-keepers, notice any difference in the effect upon the strength of the bees, their vitality, in feeding on the one hand with honey, and on the other hand with sugar syrup?

Mr. Gemmell: They have this pollen in the hive, and they will utilize the pollen in order to supply nitrogenous material, no matter what they are fed with.

Mr. Hall: You cannot raise bees without nitrogenous food, and as they have a reserve they utilize it, so it makes no difference what you feed so far as that is concerned.

Prof. Shutt: That question cannot then of course be answered.

Mr. Hall: No. You can of course take all the pollen from them, but if you do they cannot breed.

The President: Sometimes the bees are short of stores and they are fed sugar stores. Bees will winter on stores made from granulated sugar without anything else, and they will come out clean in the spring, but it is impossible for them to raise brood without nitrogen in some form.

Mr. Frith: In regard to being fed separately on sugar syrup, there must be some pollen in the hives. A few years ago there was a terrible fatality among bees, and a great many bees died all over the country and throughout the United States, and the journals of the United States, and the best bee-keepers came to this conclusion, that the bees suffered for want of pollen. Pollen had been very scarce the autumn before,

and they had not stored sufficient to keep up their vitality, or this waste of tissue. Of course, my experience has been, and I think it is the experience of most bee-keepers where I have been, that if you have to feed anything at all, in a great many seasons, your bees will winter far better on granulated sugar. You must take into consideration that they must have had a certain amount of pollen in those hives before you feed the sugar.

Mr. McEvoy: I think what Mr. Shutt meant to ask was, what would the bees winter best on?

Mr. Shutt: I put the question as one in physiological chemistry. Admitting, and supposing that they had access to no pollen, would they not do better on honey than on cane sugar? If they did, I could account for it by the presence of pollen grains in the former, by the absence of nitrogen in the latter.

Mr. McEvoy: Yes, they do.

Mr. Holtermann: I do not think there is any data on that question, but it seems to be reasonable, and the theory is generally accepted by bee-keepers at the present time, so long as the bees winter quietly, and all they have to do practically is to keep up the heat of the hive, under those conditions almost hibernated but not hibernating proper; that there is no wear and tear of muscle, and under those conditions they do not require the nitrogenous food and do not require pollen, or at least, to a very slight extent. The question is, are the bees able to take up the honey, or is it the excrement that the pollen grains pass through? If that is the case, it would almost indicate that the bees are unable when they are in that quiet condition to take up the honey.

Mr. Gemmell: Personally I believe there is very little excrement on the bottom boards. I believe it is pollen grains that have been passed out after.

Mr. Hall: I think it is pollen grains that have already spoiled in cleaning the combs out.

QUESTION DRAWER.

Mr. W. A. Chrysler: Has any bee-keeper present found it profitable to save propolis to extract wax from?

Mr. Alpaugh: My experience is if it is just propolis there is no use saving it.

Mr. Post: That is my experience. If it is all propolis that is all it will ever be any way.

Mr. Chrysler: The reason I ask this question is, that a bee-keeper sent me twenty or more pounds of wax which he claimed was rendered entirely from propolis, and it is very nice wax. He is one of the best bee keepers in Canada.

Mr. Gemmell: And does not know propolis from wax?

Mr. Darling: How do you separate propolis from wax?

Mr. Post: By the steam wax extractor.

Mr. Darling: How, and why does it separate?

Mr. Smith: You put it all into the solar extractor.

Mr. Hall: The propolis stays on the tin of the extractor, and the sun melts the wax and it runs away.

Mr. Smith: It will run sufficiently to cake.

Mr. Darling: I find that where there is propolis and wax mixed together, no matter if it is in the comb I have taken, or whether it got mixed in the wax extractor, when it is placed in hot water it separates itself. They both melt. Propolis is heavier than water and goes to the bottom and forms in hard lumps.

Mr. FRITH: In getting wax from propolis there must be small quantities of wax on the frames.

Mr. CHRYSLER: Probably this man meant he had scraped the propolis off his frames and rendered the wax from it. A great many, I think, probably throw away too much propolis that contains wax.

Mr. SMITH: What is the best manner of preventing pollen in the section? Is it by the use of the thinnest foundation or some other means?

Mr. HOLTERMANN: I believe in the thinner foundation up to a certain stage at least, but I do not think the heavier foundation would give you any more pollen in the sections than the thinner.

Mr. HALL: I do not know that there is any information in what I am going to say, but we put in about six thousand sections this year and we took about 4,500 of honey, and I must say there was two supers out of the whole lot that had a quantity of pollen in them, and I do not think there is an average of one cell of pollen to the whole super. This was not taken off a shallow hive, it was taken off a hive 12¼ inches deep, and I used thick foundations. I never think of the pollen that is in it, I think of the honey that is in it. Last year, we had a lot of pollen in our sections, and it was heavy foundation; this year we used heavier foundation and we never had so little. I can not account for it; we used the same depth of hive.

Mr. GEMMELL: There is a great difference in the seasons in regard to pollen in sections. The depth of the frame would have a great deal to do with it.

Mr. SMITH: Last year we had very little pollen in the sections, and this year we had a great deal; I could not account for it. The foundation was as near the same as it could be. I thought it must be the season or the time of putting on the supers. The supers were put on after the bees swarmed.

Mr. HOLTERMANN: I think there is no doubt that this season had a great deal to do with that. In our own comb honey, we never had so much pollen in sections, and another man told me he had no pollen in sections, practically; I went through his comb honey, and I found he had more in it than he ever had before. A man at the Toronto Exhibition said to me: "I don't believe I have got a cell of pollen in that whole pile." The judges broke up a section, and they found in that very section two cells of pollen.

Mr. FRITH: My experience, as far as my experiments have gone, in regard to the deposit of pollen, is that 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 brood under the sections is 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 deposited 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 as mine, 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 re-filled, by 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 has been that you will have very little pollen in the supers.

Mr. F. ORTT: I would ask if the no-bee-way space is likely to come into general use in Canada?

Mr. GEMMELL: We want this honey to come within one-sixteenth of the wood all the way around; they ought to have veneering for two reasons We want this veneer there so that when the retailer sticks his fingers in to pull the section out he will not get his fingers into the honey. I am not here to advocate the thing or 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 that 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 them honey, 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 five-sixteenths of an inch between the surface of one 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. It looks very pretty to the purchaser, and I hope it will not be a very great annoyance to him in handling it.

Mr. GEMMELL: You spoke about the section and the space at the sides of the section. The honey at the top bar will just be the same in this new section as in the old one. 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: The honey in the present 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. Do not 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 a better article without the bee space than you can with it. There is a difficulty in connection with an untutored person handling that honey. I venture to predict that, if there is any permanent change, 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. The market at the present time demands 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 not 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 haven ever advocated it very strongly. I have always had the idea that a perforated separator with cleats on it, and no space in the section, 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 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 on that subject, and they have been investigating along this line. Now, the question is the best and quickest way, and I will 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 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 as other vinegars, and in order to do that you have to deal with the Inland Revenue Department.

Mr. SPARLING: Some man 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: Another question I would like to ask is, in the event of changing the 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; 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. FIRTH: I think years ago we took this subject up and it was intimated that we make a reversible not an invertible super; Mr. Hall has one and he uses it largely. Let us hear from him.

Mr. HALL: As far as the reversible or invertible or interchangeable super is concerned, I have had one hundred and fifty of them for twelve years, and I do not invert them and I do not interchange the sections from the outside to the end. I do not use those first-class qualities that the super possesses, but I use a super that I like better than them, the one that Mr. Newton was telling you about just now, a super that holds but twelve sections, and it 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. It is like this: (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 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. I just do the reverse; I put them on the strong ones. When I think they are active and willing to go up, and the honey is there for them to get, 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 top of the hive, taking twenty-four or twenty-eight sections, they would be pretty loth to leave home and go up in that garret. I find in my experience that they commence much sooner in these small supers

than they do in large ones, and they always commence towards the middle of the hive. When they have commenced nicely in those little supers, making it a sort of crescent shape just over 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 of them all full of honey, we take the two supers with the honey all in the centre, and it is all empty around the outside. 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 corners all filled, and as soon as they want an addition, if you choose, 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 then twelve more, and so on till we get up to perhaps 150 sections, and we give them a good rest at that. We mark on the end of the supers the date 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 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 hiving a prime swarm would you give them the twelve sections?

Mr. HALL: Forty-eight to fifty-six.

Mr. GEMMELL: Would you 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. Neither have I tried that bee space. 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 perforations 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 sections 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 outside 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. I use them and I find them a good thing. 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-six sections in the super instead of twenty-eight.

Mr. FRITH: You experimented?

Mr. GEMMELL: I took all my comb honey last year by that process.

Mr. HOLTERMANN: With regard to the question of the best super, if 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 which I do not think has been brought out in bee-keeping very much, and I think if you will 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 divider. As far as my experiments go with the perforation throughout the inner part of the hive, that is in the separator, I can see no great advantage in it. 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 if you take metal, which you can buy perforated accurately and exactly which is perfectly smooth, at much less money, it will answer the purpose fully as well as the wooden divider, and all you have to do at the end of the aeason is to throw it into hot water and add a little lye to it, and it is just as good one year as another; while if you use the wooden divider and you are anxious to produce a choice article you practically throw those seprators and dividers away every year, as it is difficult to clean them, you can never get them quite as nice again. The wooden ones are comparatively expensive, and you will find the iron answers quite as well.

Mr. HALL: I do not say the small super is the best. I do not say any super or hive is the 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 only.

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 must remember I am an old fashioned fellow, and I have hives in my possession seventeen and twenty-two years of age. We commenced taking comb honey about nineteen years ago in sections, and 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 will necessitate a rim.

Mr. HALL: No sir.

Mr. POST: When one end is built up one would be higner than the other.

Mr. HALL: Just lay a sun cap on and 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 there 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 as well as I can. 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."

FOUNDATIONS.

By F. T. SHUTT, CHEMIST, DOMINION EXPERIMENTAL FARM OTTAWA.

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, their object was to ascertain the relative values of certain brands of foundation combs that were in the market.

Before I relate to you how I conducted these 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. It is necessary to consider 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. A large number of organic substances fall into one or other of certain well-known classes. Thus there are waxes, fats, sugars, albuminoids, etc. The chemist, for instance, knows of a great many kinds of sugar, he knows of a great many kinds of fats; but the fats are nearly related to one another, so are the sugars, and so on. 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 true fat, such as we usually recognize, yet it is, as it were, a first cousin. Beeswax 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 that it is not collected, it is the natural outcome of certain glands. I must assume that you are conversant with the anatomy of the bee, as undoubtedly you are. You will remember there are certain glands consisting of cells which are set apart for the secretion of wax. 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. How, then, is it produced? It must be produced by the bees at the expense of the food which they eat.

That is an important point to recollect. The bees make the wax from the food that they cousume, 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 for a moment the production of honey and wax by the bee. Honey, I take it, 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 it collected as such. In a sense honey is a secretion, but, at the same time, in a measure, it is a material collected by the bee. If you examine chemically the sugar 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 a greater or less percentage, but in honey which is termed ripe there is but a very small percentage 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, due to some physiological functions of the bee, the sugar that it collects is changed, it is converted into another kind of sugar within the bee. I can very briefly explain to you how we know that. One way in which we distinguish different sugars is by their effect upon a ray of polarized light; if such a ray of polarized light is passed through a solution of sugar 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 has converted the sucrose of the nectar by what is known as a diastase or ferment into the two sugars which are known as laevulose and dextrose, so called because one sugar turns the ray of light to the left and the other turns it to the right. This conversion of one sugar into another is not at all difficult for us to understand, because we know that our own digestion is carried on by the secretion of diastases or 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 any food containing 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 the circulation. These are important points in connection with the production of honey that it would be well for us to remember, because they throw some light upon the work we have more particularly to consider to-day as we shall see later on. I do not propose, however, to say anything further with regard to honey production, because my work has been entirely confined to this question of wax and its production. 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 1,000, that of beeswax becomes 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, or, as it sometimes is called, paraffine wax, is not a wax really; it is not related to beeswax at all. Paraffine has a specific gravity of .999, it is, therefore, very much lighter than beeswax, and its melting point is 130 degrees Fahrenheit; its melting point is, therefore, fifteen degrees below that of beeswax. It thus comes about that much disaster results from the use of beeswax adulterated with paraffine, because our high summer temperatures cause the melting of the paraffine in the adulterated wax, and the whole comb collapses.

Now, a word or two with regard to the objects in furnishing our bees with foundation comb, and I expect now to be inviting criticism, which I shall be very glad to have. Briefly, as I said in 1894, in supplying foundation to the bees the object is to save much of the expenditure of food and tissue in the formation of wax, allowing the bees more time and energy and material for the production of honey. One of the chief objects of our investigation was to ascertain the relative ease with which bees could utilise the

different brands of foundations experimented with; that is to say, the relative ease with which they could be drawn out and built into cells. I argued that that foundation would be the most profitable to use which 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 would be the most economical.

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 ascertained accurately the weight of a two-inch square piece of each We did this by means of a stamp or die made exactly two inches square, stamping out of each of the foundations a piece or several pieces—ten pieces. From the weight of these the average weight of two inches square of the several brands of foundation was obtained. At the close of the season the caps of the cells were carefully removed, the honey was extracted by an extractor, and the combs 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 we got rid of the last traces of honey found in the comb. Then we took this very same dye and stamped out from the empty comb two inches square and weighed it. The results I will now read in detail; they are tabulated and show the weight of the foundation and resulting comb in grammes.

The tables show the original weight of two inches square of foundation, and also give the weight of the same area of empty comb at the close of the season. From these data I was able to calculate the percentage of wax that was added by the bees to these respective foundations. I found that such percentages varied greatly; in some foundations the bees added only 75 per cent. of wax, whereas in others the percentage went up to as high as 175 per cent. When we supplied a heavy foundation the percentage of wax added was the least, and when we furnished the bees with the lightest foundation the bees added the largest percentage of wax. Thus in "Foundation in general use," (the name of one brand foundation supplied to us) we found that the percentage of wax added, in round numbers, was 75 per cent.; in the "Patent process," twelve square feet per pound, the wax added was 175 per cent. We may consider one or two as examples or illustrations: The "Foundation in general use," two inches square, weighed 1.41; the wax that was added by the bees was 1.15; in the case of the "Patent process, twelve square feet per pound, the weight of the foundation furnished was 1.00; the weight of the wax added by the bees was 1.76. The first conclusion, therefore, I was able to draw from that work was that the weight of the wax added by the bees was inversely proportional to the wax supplied in the foundation. I do not mean to say by that statement that they all vary in the same proportion; such a deduction is not possible from our figures, but it is very evident from these three years' experiments, because the two following years corroborate what I am saying now, that to the lighest foundation the largest amount of wax has to be added. When we furnish a comb containing a larger quantity of beeswax then there is a less quantity of wax added to it by the bees. If our object, then, in furnishing foundation comb to the bees is to allow them time and energy for the production of honey which otherwise would be given to the production of beeswax, it will be more economical to furnish heavy foundation than a very light one. That is one of the deductions we were able to draw from the first year's experiments.

Acting on the supposition that that was the main object in furnishing beeswax, I said that it pointed to the economy of supplying the bees with a foundation of not more than seven and a half or eight feet to the pound. That was what our results showed. In other words, when you employed a foundation which occupied an area of fifteen square feet to the pound then the bees had to supply a very much greater amount of wax in building the cells than they did when you supplied a wax foundation of eight or nine square feet to the pound. There were several other points noted and which are of some importance to you. For instance, when we started with a darkly colored foundation we found that the dark color remained and that there was a heavy and unsightly "fishbone," as it is known, in the resulting comb, and I suppose that that materially affects, if not the quality, at any rate the sale of the comb honey.

Another matter we wished to find out was what differences, if any, existed between these foundations in the ease with which they could be drawn out by the bees. Thus, supposing we were to take two waxes of different brands, but of the same weight, could the bees utilise more of one than they could of the other? Several of these foundations that were submitted to us were milled at different temperatures, and the object was to ascertain if the milling temperature had any effect upon what I might term their ductility, or the ease with which they might be drawn out by the bees. There were certain data to support the theory that there was a difference in the ductility of these foundations, but in going through the data more carefully that apparent favor, that apparent balance in favor of certain foundations, did not seem to hold. However, there are, as I say, certain data to show that there is something in the view that the milling temperature has an effect upon the relative ductility or ease with which it may be drawn out by the bees. I am now rather of the impression that it is a question of denseness or compactness rather than one of temperature in milling that affects the ductility of the foundation. Probably we shall find that the harder they are pressed in milling the less ductile they are.

If it is true, as I have said, that the wax furnished by the bees is inversely proportional to the wax furnished them in foundation comb, are we justified in carrying that argument out to its logical conclusion? Should we endeavor to furnish all the wax for the comb? Now, I do not think that possible, and to bring before you my reasons for thinking so, I should like to recall to your mind what I said with regard to the production of wax, viz., that it is not collected by the bees, it is a normal function of certain cells in the bees, and I doubt very much if we could so alter the constitution of bees so as to direct all their energies towards honey making, and to entirely give up and abandon wax production. I believe, therefore, that there is a limit wherein it will be economical for us to supply the amount of wax, but we should not go beyond that limit. So much for our first year's work; I was not altogether dissatisfied with it because it left certain points in doubt. You can readily understand that this work was fraught with many difficulties. The differences between the brands tested naturally were small. The weights were all taken with great care, but nevertheless the errors of experiment must necessarily be there, and guard against them as you will it would be very rash for anyone on one or two years' experiments, unless the data were most pronounced to draw final conclusions.

I should have mentioned that in the first year's experiments we opened the cells at the close of the season by shaving off the top of the cells. The following year I thought I could improve on that method. Because of the unevenness it naturally resulted that a little more of the cell wall came off in certain places than it did in others; and so in the following year when we repeated this experiment, instead of shaving off the caps we carefully picked each each one out with a penknife. Then we did not extract the honey in an extractor, but the sections were placed in water and the honey was dissolved out. They were placed in successive quantities of pure water until all the honey had disappeared, and then the honey comb was allowed to dry in the atmosphere. Two inches square were then stamped out as formerly. Comparing those results with the results we had obtained the year previously, we found that in nearly every case the amount of wax added by the bees was somewhat more, and I accounted for this apparent extra deposition of wax by the fact that we had not removed any of the cell wall, that we had only removed the cap. I believe there are beekeepers who have considered these results and who consider that this explanation is not correct, that it is rather due to an extra production of wax by the bees that season. I know it is held by many of you that the production of wax, and I think there is something in the theory, is in a measure relative to the production of honey. However, it seemed to me that at any rate our latter method was more accurate, and that it would in a large measure account for that apparent extra deposition of wax by the bees.

Then, another object in the second year's investigation, was to ascertain the relative amount of wax added by the bees in the outer and inner sections, it being held by some that there was a greater wax deposition in the outer sections than there was in the inner

sections. However, to dismiss that point at once, I might say that the data for that year did not allow me to draw any conclusion on that point, because, although there were many instances in which the wax added by the bees in the outer section was somewhat greater, there were almost as many instances in which there is a slight increase of wax deposited in the inner section. Therefore I did not feel that we had sufficient proof to allow me to draw any conclusion on that matter. However, we did receive corroboration on one point of the previous year's progress, and that was that the percentage of wax produced by the bees was inversely proportional to the weight of the wax furnished in the foundation. Then, another point that was brought out during the second year's experiments was that the deposition of wax varied according as to whether clover or buckwheat honey were stored. This is a matter that I have not seen noticed anywhere; it probably has not hitherto received the attention of any scientific investigation. We found invariably that the comb which stored buckwheat honey was heavier than that which stored clover honey. When we take the same brand of foundation and supply it to bees gathering clover honey and to bees gathering buckwheat honey we found invariably that there was a very much larger amount of added wax in the case of the buckwheat than in the case of the clover. I do not know what is the true explanation I presume, however, that it has something to do with some physiological function in the production of wax. I do not think it is a mere accident, because our work of 1896 corroborates the previous year's results in this particular, and it is impressed upon my mind more firmly the conclusion I stated sometime ago, namely, that I do not think it is possible to furnish all the wax that is necessary for the bees. Wax is what I might call a natural concomitant of honey; producing the one only proceeds with the production of the other. I think it is rather to be explained by such a statement than to say that the buckwheat honey requires a stronger cell than clover honey. That, of course, is a point that is open for further work, for discussion and investigation. We again remarked upon the unsightly "fishbone" where an inferior wax was supplied. I drew out a table of averages which is to be found in my report of that year, to show concisely the different points and I very much regret, owing to lack of the necessary time, that I was not able to prepare a large chart so that I could have pointed to them while I am speaking. The same problem as to the relative ductility was considered, but we again met with considerable difficulty. There are again, I must admit, certain data which point to certain brands of foundation being more easily drawn out than others, but yet I have not results sufficient to draw any definite conclusion; that is to say, I should not like to put myself on record as saying that the milling temperature of the wax has any great effect upon the relative ductility or relative ease with which the bees can utilise it. There are certain data, however, to which I might draw your attention in connection with this point. We invariably found that the "Choice wax by the Root mill" which was milled at 89 degrees, was apparently used to a greater extent than that milled at 120 degrees. This we found to be the case in each year, and those are the data which go to support the view that there is something that effects the ductibilty in the milling temperature of the wax. The data of the other brands of foundation were not sufficiently complete; that is to say, we only had a few instances in which the same wax was milled at different temperatures, and therefore under such conditions we could not draw a strict comparison. However, from the results obtained from the "Choice wax of the Root mill" we found invariably that there was a larger percentage of the wax furnished utilised which was milled at 89 degrees than there was of that which had been milled at 120 degrees Fahrenheit.

To sum up what we found out by the second year's experiments. First of all, a very noticeable increase in the addition of wax furnished by the bees in the case of storing buckwheat honey; then, our results of the previous year were corroborated as to the larger percentage of wax added by the bees when only a very light foundation, such as twelve or fifteen feet to the pound, was supplied in comparison with the small quantity of wax added when a heavier foundation was furnished to the bees. That brings us to 1896. The same line of investigation, with certain alterations, was continued in our third year. Some correspondence that I have had with members of the Association led me to think that there were other reasons in supplying foundation than those that I have stated.

From this correspondence I was led to conclude that there were other grounds besides those of economy in furnishing wax for the cells, and so I wrote to Mr. Holtermann, the editor of the *Canadian Bee Journal*, to give me his views as to what he thought were the objects in furnishing foundation comb, and if you will allow me I will quote from his letter. He says: "As to the object of using comb foundation, brood foundation is used to save the bees time and material, to get all worker cells, and to secure straight comb. The foundation in the sections is first of all to aid in enticing bees into the supers, to save them material by the giving of wax, to save time, as they can begin storing more quickly in the supers; also to get an evenly filled section, and to have it attached to the sides and bottom of section. Bees are much less likely to do this well when they build the comb themselves. Again, it is desirable to have the cells of a uniform size; by giving them the foundation that is secured."

Admitting this we notice that there are other objects besides this economy in furnishing wax, objects which are important from a commercial standpoint; these I had not fully realised before. I take it, if I have gathered aright the meaning of this information, that one of the principal objects is to have an evenly filled section, and to have a perfect alignment of cells and not an irregular comb. Of course, as stated by my correspondent here, it is partly to furnish material for comb building and thus save time and energy which the bees could utilise in the production and storing of honey. But you see this makes the question a very much broader one, and with regard to those points, it is not one upon which chemistry can throw any light. The only solution to the problem, as far as chemistry is concerned, must be in regard to the economy of furnishing material, and in ascertaining if there are any differences in the ductility of the different waxes. I wish to state this matter fully and plainly to show you what our position is in this investigation, and also that I may, just at the close of these brief remarks, have a discussion which will assist me in prosecuting this study in the future. If our work is to be of any value to you it is necessary I should be put in possession of all facts and theories in regard to the matter, so that the investigation may be carried on upon correct lines.

The details of the third year's work are tabulated in our report for 1896, and in the main they corrborate those of the two previous years. We found again that those foundations which were, as I may term them, extremely light, required a larger amount of wax to be added to them by the bees; and we found those foundations which were heavier required the least amount to be added. There are one or two further points in this connection to which I might draw your attention. We wished to ascertain if when a heavy foundation was supplied to the bees they continued to build it heavy or if they utilized that extra amount of wax that they were furnished with to build up the cell walls. It seemed from our previous work, that after a certain height in the cell was reached the bees do not touch the bottom wax at all. They continue building the cell walls moderately heavy, if a heavy foundation comb has been furnished them; but I make this deduction, that after a certain height in a cell wall is reached they no longer can utilize the wax that is furnished to them. That is very well brought out by using one of these inferior and darkly colored foundation combs. One can very readily trace in the empty comb which has been carefully cleared, where new wax begins to be added; the height of the cell wall to which the original foundation has been drawn can readily be discovered. A practical deduction can be drawn from that fact, that there would be no object in supplying a very large amount of wax, because it could not be utilized by the bees and it would only render a hard thick fishbone in the finished comb. There is a limit, therefore, to the amount of wax it is well to supply. You must understand that although our result points to the advantage and economy and the profit of supplying a moderately heavy foundation comb, yet that conclusion must not be pushed too far. There are limits beyond which it is no longer economical or advantageous to supply wax for the reason that it cannot possibly be utilized by the bees, and only remains there and destroys the saleability of the finished product.

In the third year of the investigation we carefully removed each cap separately, and then placed the full honey comb in successive quantities of water until we had completely dissolved out all the honey. The comb was then allowed to dry in the air. Further, I

thought it probable we could arrive at some useful data with regard to the relative ductility of the wax if we could shave off all the superstructure and leave what remained of the foundation, and then weighing the resulting comb base as compared with the same area of foundations which was supplied to the bees. Such a method should give data which would allow us to draw a conclusion as to the relative ductility of different foundations. I confess I met here with great difficulties, because the foundation was not all on one plane, and consequently it was almost impossible to so cut the foundation as to leave nothing but the foundation and none of the cell walls. If we shaved off all the cell walls in one part we ran the danger of cutting through the foundation in another. The matter was done, however, with the greatest care and all possible accuracy, and the results have been obtained and are tabulated. This gave us not only the weight in grammes of the foundation supplied, but also the amount in grammes of the foundation which has been removed by the bees into building the cells. From these data we calculate the percentages of wax that were utilized by the bees from these various brands. They afforded a very interesting table of percentages. We found that some waxes were utilized to the extent of fifty per cent. ; that is to say, one-half the wax supplied them in the foundation was utilized in cell wall structure ; we found in other foundations that only seven per cent. of the wax furnished them in the foundation was utilized in building cell walls.

Mr. HOLTERMANN : Were those specimens drawn out during the same honey flow ?

Mr. SHUTT : Personally I cannot vouch for that, but I can tell you this, they were taken out of the same hive the same year at the same time, being put in at the same time. The differences that I here refer to lie in the weight of the foundation submitted. For instance, in those of "12 feet square" and "15 feet square" per pound we found very small percentages of the wax utilized by the bee ; the bees did not weaken the base of the cell ; there was not the extra amount of wax for them to utilize in building cell walls. In the "choice wax of the Root mill," and to a certain extent in a number of others, we found 49.54 per cent. of that foundation wax utilized in this way by the bees. The same is true of the "Choice wax by the Given process" ; in that as much as 45 per cent of this wax was drawn, However, as a matter of fact, on an average we found somewhere between 30 and 38 per cent was the percentage of wax that the bees ordinarily utilized from the foundation. Practically, in round numbers, that from all foundations of ordinary weights there was in the neighborhood of one-third drawn out and utilized in comb foundation, while in what I may term excessively heavy foundations there was utilized in the neighborhood of 50 per cent. When we supplied the bees with only a light foundation, such as the "patent process," the percentage that was so utilized was less than ten per cent. If the main object in furnishing the bees with wax is to provide them with material for comb building, the economy of supplying them with foundations of not less than 8, 9 or 10 square feet to the pound is evident. I doubt very much when you exceed that if you are really furnishing the bees with anything they make use of. That is the deduction I make from these results. There is a tendency on the part of the bees to build up a cell which is fairly uniform in weight ; that is to say, storing the same kind of honey. If the bees do not find it furnished them in foundation then they supply it ; when you furnish it the bees use it as far as they can. Further, I think I have shown how it is that they cannot use more than a certain amount. We cannot furnish enough to build the whole cell. Again, we find this very large difference in connection with the storage of buckwheat honey. There is at least fifty per cent. more wax in the comb in which buckwheat honey is stored over that in cells containing clover honey.

Mr. HOLTERMANN : Do you happen to know if the flow from buckwheat is greater than that from clover ?

Mr. SHUTT : I cannot answer that question. The more honey they make the more wax they must make. I think probably we shall have more data in time to come to bear out that statement.

With regard to the milling temperature as exercising an influence on the ease with which wax can be drawn out, again we found that wax milled at 89° Fahrenheit was more easy to draw out than that milled at 105° Fahrenheit. When we obtain the same

results in three consecutive years I think there is something in them. There are instances which do not lend any corroboration to that view, and it may be, in fact I am inclined to think, that there is importance to be attached to the state of compression of the wax that you furnished the bees rather than to the temperature at which it is milled. However, these data stand on record in the matter. The results of that third year, on being calculated, show that the percentage of wax added by the bees in seventy per cent. of the trials made, was thirty and forty per cent. Roughly, we may suppose, from our ordinary foundations about one-third of the wax is utilized in comb cell building. In five instances there were less than thirty per cent., and those were a very light wax. Now, the average weight of the foundation after the removal of the cells is considered is fairly constant. That is another important point. It cannot be constant; because, as I have shown, the bees can only utilize the wax to a certain stage in the building of the cell, and yet with very light wax they do not wish to weaken the base of the cell. But, there is a tendency on the part of the bees to build up a cell of a constant weight, and that plainly implies that the weight of the foundation after the removal of the cells is a fairly constant one. The greatest weight of foundation, after the removal of the cells, was in the "Choice wax by the Given process"—one of the heaviest foundations that we employed in our tests. The lightest one was not the one we might have supposed, with its 15 square feet to the pound, but the "Choice wax of the Root mill" milled at 89° Fahrenheit. There is in this something that lends corroboration to the view that wax milled at 89° is more ductile and more easily drawn out by the bees than wax milled at a higher temperature. I think that this is an important point. This "Choice wax by the Root mill" process was by no means the lighest employed in the trials. With regard to the others, I have not been able to see that there is any very great difference. I imagine that the bees do not work with that regularity that some of our poets have supposed them to, and the season and the flow of honey and many other circumstances have an effect upon this matter of wax and its production. Consequently I am not surprised at finding that we are not able to draw conclusions showing that there are great differences between waxes somewhat similar in weight.

I think I have brought before you practically the lines of the work that we have been engaged in and the results that we have obtained. I do not expect that these results will solve the question as to the relative usefulness of various foundations to the beekeepers, because I am fully aware that there are other considerations that must be thought of besides that of furnishing wax for material in comb building; but I think that we have arrived at conclusions as far as that point itself is concerned, which are of some importance and value to beekeepers. I trust that there will be some little discussion on this point, so that if we find it possible to continue this work we may start it with more information than we have had in the past. (Applause)

Mr. HOLTERMANN: With regard to the milling point of wax at 145° and paraffine at 130°, I understand some of these paraffine products have different melting points. I also understand that the melting point of some is so high that in Germany—I remember particularly Germany being mentioned in the European bee journals—they utilized a certain percentage of these paraffine products and not wax alone in the production of foundation.

Mr. SHUTT: I just mentioned the fact to show our work at the Experimental Farm had been of immediate usefulness to bee-keepers. Beeswax can be adulterated with vegetable waxes which have as high a melting point as beeswax proper; then of course we cannot arrive at the nature or extent of that adulteration by a mere determination of the melting point. We must then go to chemistry; it would be necessary to make a complete analysis to detect and determine foreign waxes.

Mr. HOLTERMANN: You think it is possible that that statement is correct in Germany, that they do utilize these cheaper products in the place of wax?

Mr. SHUTT: I would not like to say anything about the German practice, because I really do not know. I think it is possible. It is something which I think is within the bounds of possibility.

Mr. HOLTERMANN: They simply state that such is the case, but we in this country have felt inclined to doubt the possibility of it. I am very much pleased to hear Mr. Shutt's opinion that he thinks it is possible. In regard to these experiments, I believe that the first experiments that were conducted with various weights of comb foundation were carried on by the Experimental Union of the Ontario Agricultural College, Guelph, and at that time I suggested these experiments and the different weights that were taken were rather extreme; that is, we took as heavy a brand as we could get hold of, and we took the lightest we could get hold of and then one grade between and something like twenty specimens were sent in which had been put into sections. Now, in every case by holding up to the light, and even by pressing on it with a dull knife, we could detect without looking at the side of the section, which way the foundation had been put into that section. Following those experiments, as far as I know, this line of work was taken up by the Michigan State Agricultural College and they wrote me at that time and sent me a full set of combs saying that as I had been the first one to do anything in that line, they would like me to carry on some experiments in the same line, and, if I can remember correctly, they corroborated those experiments; that is, that as a rule, with few exceptions, that it was in proportion to the weight of foundation supplied to the bees. I know a great deal about Mr. Shutt. He has the reputation of being exceedingly careful in all his experiments, and all the work he has shown we can depend upon it has been done in the most painstaking way, and the only criticism we can offer is that Mr. Shutt does not profess to be a practical bee-keeper, and a point which is lost sight of and which is of great value to the practical bee-keeper is the amount of what we call fish-bone left in that foundation. We want to supply a certain amount of wax, but we dare not go beyond a certain weight of foundation, if we do so, we get a certain amount of fish-bone. Now, some of us claim, and I think justly, that under favorable conditions a good deal of comb foundation is utilized by the bees, but if a heavy flow comes on suddenly, then the bees do not utilize the wax in that foundation to the same extent; they begin adding to the wall of the foundation. I think as practical bee-keepers we may supply them with an article which under the most favorable conditions is not going to be too heavy. This is the only point which I think in those experiments, and in giving the results, has been lost sight of to a very great extent. I know there are many who profess that they use a heavy comb foundation, but let us try that comb foundation; I believe there are samples here on the table; let us test it and send it around and see the amount of base there is in that comb. If there is not much fish-bone in it that will be strong evidence that it is a good article. The first year in the Ontario Agricultural College experiments we carried on work in that line, and we went altogether perhaps in the other direction. We had a very fine instrument for detecting the thickness of any substance, and we took these combs, shaved them down, and put them upon ice to make them offer the greatest possible resistance and then tested them and we found a very material difference, and that difference almost I think in every case varied in proportion to the weight of foundation given to the bees. And, more than that, just to see how far they did utilize the wax given, we not only took a dark colored foundation, but we colored it absolutely black, then we filled the empty comb with plaster of Paris, that made a solid comb, and then we shaved it off, and you could just see the inside of that with the naked eye the difference in the thickness of the comb foundation given in the first place, and you could see how high up on the side of the wall that black foundation was used; it was up as high as over one-third of the height of the finished cell. In all comb foundation at the present time, if you look at it, you will find that it has quite a thick side, while if you shave it off, after the bees have utilized that and built the comb, you will find in every case there is a certain amount immediately adjoining the base that is never touched by the bees, and the thicker the side wall is to begin with the thicker you will find it. These are points of interest that are of exceedingly great practical value to the bee-keeper.

Mr. SHUTT: In every one of our reports I have pointed out the fact that it is the heavy comb foundation that has always resulted in leaving a heavy septum or fish-bone. We have two contending motives: we do not wish on the one hand to supply such a heavy

wax as will leave a heavy septum, at the same time we want to furnish, as far as possible, all the wax that can be utilized by the bees; it is in the middle course that we are going to find our salvation.

Mr. HOLTERMANN: I went to one extreme, and you went to the other.

Mr. HALL: If you want us to give you our honest opinion, in my case, the main desire is not to keep the bees from utilizing their time and energy to make wax, but it is to get all the worker comb in our hives. That is the main point. We then raise a host of laborers, not consumers or idlers. If we can get it with a small quantity just as well as we can with a large quantity, so much the better, but we have what we call sagging of the comb, and that sagging of the comb puts cells out of shape which the queen does not utilize, and therefore there is no brood raised in them, either drone or worker. As far as your thin foundation and your thick foundation and your temperature are concerned, when you crush the wax you break the grains, as some of the ladies do in working the butter; they almost work it to death. By breaking the grains, my humble opinion is, the bees couldn't get hold of them to utilize them. Wax is crumbly and if you ever break wax you will see it looks grainy. The bees can get hold of this grain and pull it out and stretch it, and if it is all worked up so that there is nothing for them to get hold of, they cannot utilize it. They cannot get hold of the skin of the fruit because it is smooth. They cannot get hold of the patent process because it is squeezed to death. The bees say, "Look how tough it is, we do not want it; we want something full of grain that we can utilize and pull out and make comb and make it quickly." I have reference to comb honey or to the brood; I do not trouble which it is. We want it heavy in the brood nest, not because the bees utilize it, but simply to keep that comb from sagging. And then these manufacturers tell us to put wire in it. They do not have the job of doing it, they simply stay in their factory, but they say that will get over all the difficulty and save you so much for foundation. I would rather pay $100 for foundation that suits me than $50 for foundation that does not. I had to get my own machine to make a certain make of foundation that the bees utilize. Put it alongside of this process that makes it so shiny, and so that there is nothing left but back-bone, and they cannot utilize it. As regards the fish-bone, I have sold honey for thirty-two years, and I take comb honey principally, and I have had but one solitary complaint about fish-bone in comb honey. It sometimes takes first prize. I have had one small complaint and that was from a man that was a farmer; on one occasion he had a stock or two of bees, and he sold his farm or rented it and went to town and started a grocery. I sold him some honey and he said, "Don't you know that there is fish-bone in your honey?" That man did not know what he was talking about. That is the only time in thirty-two years we have had a complaint; we have sold tons upon tons of it, and we have never received a complaint. This fish-bone business is only a bugaboo. The manufacturers get up these beautiful things They say, "Look at that, see how beautiful it is," but the bees do not think it beautiful and they do not use it because they cannot. The main object of using foundation is to get all worker cells and not drone—straight comb.

Mr. HOLTERMANN: Let us test this thing; there is a section of Mr. Hall's on the table; send it around and abide by the decision as to fish-bone. In regard to the question of brood comb foundation, Mr. Hall says the less there the better as long as it does not sag, and at the same time he says he has no use for the patent process. Evidently he has never tried it, because what we call medium brood comb foundation in the patent process is as strong as the heavy is in the other, if that is what you want.

Mr. HALL: The bees cannot work it.

Mr. HOLTERMANN: They do. Mr. Post has over 300 colonies.

Mr. POST: It gave the best satisfaction for me.

Mr. MCKNIGHT: In your work, along the lines that you did work you found that the amount of wax added was in inverse proportion to the weight of the foundation?

Mr. SHUTT: Yes. It does not work all through

Mr. McKNIGHT: That being the case, the bees must have of course secreted more wax and added it to the lighter foundation than they did to the heavy. When that foundation was drawn out and a given proportion shaved away along the septum, as you refer to it, do you think that the cell walls thus drawn out would be about equal in weight for an equal size, say two inches square; that is to say, taking for granted the cells are uniform, would the uniform thickness of the cell walls be alike or nearly alike in each case.

Mr. SHUTT: That would depend. After a certain height was reached they would, but it was not so in the first part of the cell, near the septum. There was a tendency at first to continue in the same relation of weight as that supplied in the foundation, but as the cell walls got higher there was a tendency to make them a constant weight; taking the same kind of honey, there was a tendency to make the cell walls approximately all of the same thickness.

Mr. McKNIGHT: Would you deduce from your experiments that bees left to their own instinct—and even when they are not left to their own instinct, when foundation is supplied them—would put about the same amount of wax into a number of cells of a like size?

Mr. SHUTT: Yes.

Mr. McKNIGHT: Then the practical deduction to be drawn from the experiments I think is that the foundation comb supplied should come as near the weight which the bees naturally make it as possible.

Mr. SHUTT: If the weight of the foundation that you supplied the bees was only of the same weight as the natural septum or a basal plate, then you would not be furnishing them with any material to build cell walls.

Mr. McKNIGHT: I am not sure that it is an advantage to supply them with material to build cell walls.

Mr. SHUTT: That is another question.

Mr. McKNIGHT: As to that additional weight of comb in the case of buckwheat honey being supplied, you can scarcely arrive at any reasonable conjecture as to the cause. I think it is reasonable to believe that it is not needed, because buckwheat honey is more difficult to contain, or exercises a greater pressure on the cell walls than honey derived from other sources. Might it not be that there is something in buckwheat honey itself, some principle that enables the bees to secrete more wax from the consumption of a given quantity of it, and thus having a supply more abundant, putting more wax into the cells? We know that if you feed a cow upon a given quantity of one kind of food and a given quantity of another kind of food that one kind will enable her to secrete a great deal more milk than the other. Might there not be something of that in buckwheat honey?

Mr. SHUTT: As I said a moment ago, in some way this question is wrapped in mystery, but I think the solution of it is in some such way as you suggest. It is evidently due to a physiological function. Whether it acts as a stimulating agent upon the wax in the secreting glands I do not know, but this seems probable. I do not think that the honey requires any stronger cell walls.

Mr. McEVOY: What time did you test that for the clover, was it at the beginning or middle, or near the end of the flow?

Mr. SHUTT: I could not answer that question.

Mr. McEVOY: If that was tested at the beginning of the flow the bees were thin and poor, they were not in condition to make it, while with a heavy flow of buckwheat honey it would be different.

Mr. SHUTT: These tests have been made three years in succession. I do not think there is any strength in that argument.

Mr. GEMMELL: You touched upon the point that the nectar had something added to it in order to convert the cane sugar into grape sugar, would you properly call that honey?

Mr. SHUTT: I told you it was very difficult to speak without scientific terms of recording chemical changes in ordinary language. That term is correct if it is perfectly understood. There is nothing added to it. Let me give you an illustration: When starch or cane sugar is boiled with acid, or merely submitted to a high pressure of steam, it is converted into different sugars; nothing has been added to it save water; one molecule has been broken up into two molecules. So that it would not be strictly correct to say that the bees had added something to it, for the process is a similar one. There is present in the bees a principle or diastase (ferment) which effects the conversion of the cane sugar; it breaks down the constitution of it and converts it into a new compound.

Mr. HALL: I find that during the latter part of the season, no matter what they are gathering from, they make a heavier comb and put heavier capping on than they do earlier in the season. I mean that the comb all through is heavier.

Mr. SHUTT: We have taken our results from three years in succession.

Mr. HALL: Buckwheat comes in the latter part of the season.

Mr. SHUTT: I am aware of that. I do not know that we have any flowers that come in at the same time with buckwheat, allowing us to compare them. We might take comb honey formed in the early part of the season, and take it as late on as possible with clover; I cannot say what the result would be; I do not think the difference would be as much as between clover and buckwheat.

Mr. FRITH: In regard to the ductility, did you not use the term "elasticity?"

Mr. SHUTT: No, I used the term ductility to indicate the relative ease with which the bees could draw out the foundation. Elasticity means going back to the same form again.

Mr. FRITH: A number of practical bee-keepers have found, as Mr. Hall has said, that if in pure wax the grains are destroyed and worked up until broken, that is, leaving out foreign matter, it will break very easily. My experience was that the bees would draw that out much thinner and make far nicer comb honey. I am speaking strictly of the producing of comb honey, but where it is worked in milling or in any other process these grains are destroyed and the bees do not seem to draw that out and utilise that.

Mr. HEISE: It is possible to get the comb foundation so brittle that you dare not handle it; and the bees know it, and they won't touch it.

Mr. MCKNIGHT: Have you ever had submitted to you for analysis a sample of what is popularly known amongst bee keepers as sugar honey? What we popularly understand by sugar honey is sugar syrup made from cane sugar fed to the bees and stored in their combs.

Mr. SHUTT: The Inland Revenue Department look after that matter. Our province is not to look after adulteration in food products or fraudulent properties, but it is to carry on, in the interests of agriculture, in its various branches, any investigations such as I have detailed, and necessarily and naturally the matter you speak of would not be submitted to me for examination.

REPORT OF AFFILIATED SOCIETIES.

There have been nine societies in affiliation during the present season as follows: Glengarry, Western Ontario, Brant, Norfolk, Oxford, Russell, Halton, York and Haldimand.

Each society has sent in a financial report, which gives an account of receipts and expenditures, and with very few exceptions the moneys have been expended as directed by by-laws.

The reports of the production of comb and extracted honey, and the increase of bees is not full, as this seems to be a hard report to get; nevertheless, the information is somewhat valuable, as there are reports from all quarters of the Province. Reports

from the east are very poor, there being little or no honey or increase in bees, but from the west and southern parts reports are good, and when averaged up the increase of bees is about 47 per cent. The average pound of comb honey taken per colony is 12 lbs., and the average of extracted 35 lbs.

We believe that there has been a fairly profitable season, and the honey produced has been of a very fine quality.

Mr. ORTT moved, seconded by Mr. FRITH that the reports of the affiliated societies be received and adopted, which, on a vote being taken, was declared carried.

REPORT OF INSPECTOR OF APIARIES.

During 1897 I visited bee yards in the counties of Welland, Lincoln, Wentworth, Brant, Norfolk, Kent, Huron, Grey, Perth, Oxford, Waterloo, Cardwell, York, Ontario and Simcoe. I examined sixty apiaries, and found foul brood in thirty-four of them. I found several of the largest and best apiaries in the Province very badly diseased through bees robbing foul brood colonies that had been brought from other parts of Ontario, and placed near them. Some of the owners of these fine apiaries had invested from five to eight hundred dollars in bees—one man over one thousand dollars—and to get their good apiaries badly diseased through foul brood colonies being shipped into their localities was pretty hard to bear with. But I am satisfied that none of the parties that either bought or sold the diseased colonies that had been shipped knew that they had foul brood at the time of the sale. I also found many colonies very badly diseased through the owners using old combs that they got from parties who had lost all of their bees with foul brood. None of these men knew that the old combs were diseased, or were able to tell the stain mark of foul brood on the lower side of the cells. Comb foundation is a very safe and very valuable thing to use, and those who need combs should use plenty of it, and not run any risk by using the old combs from apiaries where all the bees had died.

When going through examining every colony in a diseased apiary I marked them according to the condition I found them in, putting one pencil cross on the front of one hive, two crosses on another, and three on all the very bad ones. After we got through examining all the colonies we knew the true condition of things by the number of crosses on the front of hives. Some of the colonies I advised to be doubled the same evening, and the combs made into wax, and when the work was done in the honey season I had a considerable increase made from those least diseased, and as a rule ended the season with more colonies then I began with, and in grand condition. At our annual meeting held in London in 1892, I said that my method of curing diseased apiaries of foul brood would in the near future be followed by the bee keepers of Canada and the United States. It is all the go in far off Australia, and for this nice state of affairs I thank the editors of all the bee journals. Wherever I went in the past season to inspect the apiaries I found every bee keeper pleased to have me examine his colonies, and for the very nice way that I was treated by every person I return to them my most heartfelt thanks. I burned two colonies in one apiary, two in another, and two in a third place, and a number of diseased combs, and three in a fourth locality. The owners helped to burn some of the diseased colonies, and the other bee keepers were consenting parties to have the few worthless colonies burned. I am also pleased with the way the other bee keepers took hold and cured their diseased colonies that had foul brood in the summer. While examining their colonies to see if the bees had enough honey for winter some people found things not right; I found it to be pure foul brood. I explained how to cure it, and the most profitable way, and put everything in order. My time, car fare, and livery hire was $525.

WOODBURN, December 6th, 1897.

WM MCEVOY,
Inspector.

The PRESIDENT: There were one or two things I would like to call attention to one was with regard to the fact that some large apiaries had been badly damaged by parties bringing diseased colonies into the neighborhood when that neighborhood was clean. You remember I referred to those in the address I read yesterday. I think, perhaps, if you would exchange ideas on that point it might be beneficial.

Mr. FRITH: Did you find those colonies in diseased apiaries in new localities from former years, or were they on the same grounds?

Mr. MCEVOY: Some in new places and some in old.

Mr. FRITH: What I would like to find out is this, is the disease becoming suppressed at all?

Mr. MCEVOY: Yes, but it came from parts, as a rule, where it had never been.

Mr. EVANS: I would like to know if Mr. McEvoy finds, in going around one year after another, that where he has found foul brood one year and given the necessary directions, it has disappeared the next year? My experience of this is, and I think the weak point in the foul brood treatment is, that the cure is left to the owners of apiaries, and they do not exercise sufficient care and they do not cure it. I know that was the case in a few apiaries within a few miles of me that Mr. McEvoy had seen and given instructions with regard to, but in no case was the foul brood cured; it did not disappear. The parties did not carry out the instructions. I would like to know if he finds from experience, after he has given directions, if they really carry them out, and does the foul brood disappear under his instructions?

Mr. MCEVOY: As a rule it does; but you will once in a while come across a man that will make a failure of anything. He is not exact enough; he will do part to-day and part next week, and he is going to attend to the rest some other time. You have got to watch a man like that closely; he may be ever so honest, but he is careless, and he gives other people trouble. There are some men that you depend most upon, you know their intentions are all right, but they will not carry out the work exactly. We have men here who have made perfect work of it.

Mr. FRITH: How is it with these colonies that have been brought in, that come from a distance, and come by ignorant people? I was burned out by foul brood being introduced from Michigan. A neighbor of mine, one of the most successful bee keepers in this Province, contrary to the resolution of the Oxford Bee-keepers' Association, sent to Michigan and got a queen in a little card, I think, and a section of honey and some bees with it, and before I knew where I was he had lost fifty colonies of bees and had exposed his hives. About a year after I found I was "in the soup," and then I looked around and found this foul brood. Now, I am going into the business again, and I would like to know if there is any possible way of getting at these fellows. Some neighbors bought bees last spring, and I did not know it for months. They came almost to my own door; they brought them up in the night and I saw the bees, and I knew there had been no bees very close by; and I found the trees in bloom covered with bees, and I looked around and I found they had been brought from down in Norfolk county.

Mr. MCEVOY: In looking over the members of the Convention, I could call eleven witnesses if anyone has any doubt as to the cure. As Mr. Evans says, one careless party in a locality causes the trouble; the trouble is they hang on to the comb; they are not exact enough. Once in a while someone will not carry out the instructions exactly, and you have got to watch that one closely. Perhaps one man in fifty will not carry it out exactly. Where a man is doing pretty well with his bees, he thinks he ought to go and get a few hives for his own use; he will go down the country sometimes; some man has got discouraged with his bees, and he is going to sell them cheap; this man buys them and brings them near a man that has a large bee-yard. When a man has got $1,000 invested in bees he ought to have his locality around him inspected. He is all right himself, but what has the other fellow got? It is his business to see to that. In going through a large bee-yard, no matter who the man is, if his bees are valuable I am going to look after that fellow, because the loss would be very heavy.

Mr. HALL; If I understand it rightly, we have a law that empowers the inspector to burn on the second visitation if he finds his instructions are not carried out. I think our good-natured inspector, as efficient as he is and as wise as he is, lacks a little in that respect. I am, I think, in a very clean location, and as far as our neighborhood is concerned, I think he has acted in a very wise way, but I have just got a hint since I have been in this meeting that it is within seven miles of me and that is too close to me. I want them burned up, if the inspector has called more than once. I think I will ask that the law be enforced with regard to these men who do not or will not or cannot clean up their apiaries.

Mr. McEVOY: I agree with Mr. Hall. I have burned more this summer than before, but there will have to be a little more severe burning done.

Mr. HOLTERMANN: The inspector inspected our yard, and there was firing done after he had been there. One of the members mentioned about getting bees from the other side in the hive or in nucleus form. There is no necessity for that kind of thing at the present day in Ontario If you want to get new blood, get queens; and, if you want to be exceedingly particular and quite sure—there is no danger as far as we know at the present time from a queen—there is a danger in the food that is in the cage. If the queen breeder is not exceedingly careful, and there are germs of foul brood in that food in the queen cage, there is the danger of a portion of those germs being stored in the hive, and in that way a danger of giving the disease to the colony. If he wants to be exceedingly careful, I say, let him take that food out when the queen comes.

Mr. GEMMELL: Put the queen in another cage with candy and sugar.

Mr. HOLTERMANN: There is no excuse at the present time for buying bees in a country where they have no foul brood Act, and bringing them into this country. The first time I had the foul brood inspector come to the county of Brant there was a man in my own vicinity who was constantly buying these bees from the other side, and I was pretty suspicious; I began to be afraid of those bees. I had the inspector come there, and he found the disease in an apiary. He went to other apiaries where they had not the least idea they had foul brood, but they found they had it, and they were exceedingly thankful I had the inspector come to that part of the country. Now, in regard to the cure, I had Mr. McEvoy come to our apiary this last spring and inspect it, and in the very last colony he found something like four or five cells which contained what he took to be foul brood.

Mr. McEVOY: It was, straight.

Mr. HOLTERMANN: He says, just treat that, that will be all right.

Mr. McEVOY: Because it was a good colony.

Mr. HOLTERMANN: I said I would not for one minute, with 100 or more colonies in the apiary, hesitate about destroying them. I went and got the coal oil, poured it on the hives; my wife came out, and Mr. McEvoy says, "This is none of my doings, I am not telling him to do this." (Laughter) I just took it to one side, set fire to it and burned it right to the ground.

DIRECTORS' REPORT.

Your directors are pleased to report that the finances of the Association show a small balance in the hands of the Treasurer. We have endeavoured to expend the moneys in a way to benefit the members of the Association and bee keepers of the Province generally.

Each member of the Association has received the *Canadian Bee Journal* during the year.

There were grants given to the Toronto Industrial Exhibition Association of $25, to the Western Fair Association at London of $10, to the Canada Central Fair at Ottawa of $10.

These grants were given for honey prizes, for bee keepers' supplies, and for the different uses of honey. There was an appropriation of $200 to the affiliated societies.

The bee-keepers of the Association and of the Province have also been supplied by the Provincial Government with our annual report.

Mr. HOLTERMANN moved, seconded by Mr. CHRYSLER, that the report be adopted. Carried.

OUT APIARIES.

BY W. L. COGGSHELL, WEST GRATON, N. Y.

These few words in regard to "Out Aparies" are sent at the request of Mr. Couse. I have partaken of your hospitality and good advice in bee-keeping since 1882, at Toronto, and so feel it to be my duty to respond to the request of your secretary.

My first out-yard was established in 1878. I have now three, ranging from three to twenty-six miles from home. I take entire charge of them myself from home with the help of a man and my thirteen year old boy, except during the extracting season, when I have more.

To accomplish this I get everything ready at home when there is no work to be done at the out yards. Then the first trips in the spring sees every yard supplied with their supplies for the season. These includes fuel for smokers, and even the matches to light them with. The kegs for the honey are taken direct from the factory to each of the yards just before the season opens. Of course I sometimes make a mistake in estimating the amount of store room required, but it is an easy matter to equalize them when occasion requires. Each yard also has its regular lot of tools and furniture, which stays there the year through. This includes the extractor, store can, capping dish and knife, strainer and plenty of tin pails for water, etc. There is a supply of nails, screws, racks, wire cloth, and of course the hammer and screwdriver, two bellows, one automatic smoker, and long wisp brooms, and a wheelbarrow, make us a part of the outdoor equipment. In fact, each yard has about everything that is likely to be needed there except the bee veils, which always go with the man who does the work. The spring-locks which are on the houses are all alike, so that one key fits them all. I always try to get as protected a location as possible when locating a new yard. This is usually in the edge of a piece of woods where a space can be cleared off and levelled down sufficiently for the purpose. I always try to get them at least twenty rods from the road so as to have no trouble with passing teams.

When I make the lease for the location I include the right of way to and from it, and the right to move off the building, which I put up when I go away. This building is usually 12 x 16 feet, and eight feet high at the eaves. Tbis will accommodate from eighty to one hundred colonies, which is as many as the location will support in this section of New York. The bees are all wintered out of doors, either in chaff packed hives or in large packing boxes, holding eight colonies. Those in the chaff hives remain packed the year round, but those in the large boxes are unpacked at the time of apple bloom, and are used as single walled hives during the summer, being packed again in October for the winter.

Mr. COUSE: I supposed this paper might bring up a very good discussion on out apiaries. He is a man that does not say very much unless you pick it out of him. I understand is that his production of honey is very large, but he does this work pretty nearly all himself, with the aid of his boy and a hired man, and there is very little expense in handling 1,200 colonies of bees. I suppose he has come to the conclusion, like a good many more, that the price of honey is so low that unless we produce an immense amount of honey our returns are very small; therefore we must increase our aparies if we are going to stay in the honey business. That is his position, I understand. The price of honey now has dropped so low that a man with 100 colonies of bees dare not depend on it for a living. There were a good many complaints in Buffalo of people

going into the business who were not specialists. The question was brought up as to who were, and they asked all those who made a business of bee keeping, and bee keeping only, to stand up, and there were only some three or four out of fifty or more.

Mr. McEvoy: Did Mr. Coggshell stand up?

Mr. Couse: No; he has a farm. So that you see the bee keeping industry is usually connected with something else. If a man thinks of going into the business to make a living out of it, he has now got to be an expert bee keeper and handle an immense number of colonies to make a reasonable living. Therefore we must, if we are going to go on in bee keeping, find a market for our honey, and I think a matter that ought to receive a good deal of attention at the present time is how many colonies a man can handle and how much honey he is going to produce and what he is going to do with it.

Mr. Hall: I think the market question is the most difficult one to come at. What are we going to do with it? As far as a specialist is concerned, I would reckon a specialist a man who went into raising anything, no matter if he has twenty side occupations, if that is his main occupation. If he goes into bee keeping, and bee-keeping is his main object, I should call him a specialist in the apiary business. Mr. Coggshell's farm is a side issue, but other men have to do the work; he may be the head. If he has 1,200 colonies of bees I should call him an apiarist and a specialist at that. I think specialists in every line are the men who are going to work the cheapest and best.

Mr. McEvoy: I think Mr. Coggshall is a specialist, for although he had this large farm he did not work it. I was in the honey building at the Toronto exhibition when he sold there one day 23,000 pounds to an American from Wisconsin whom he met in Toronto. So that while he produces largely he makes some very large sales. I count him as one of the best bee-keepers in America.

Mr. Couse: He says he sells most of his honey to a baker in New York city.

Mr. Gemmell: The confectioners do not object to dark honey.

Mr. Dickenson: I would like to say a few words with regard to what we shall do with our honey. I took the trouble to write to a friend in Liverpool who is a commission merchant and sells a great deal of honey. The reason I did so was because I saw that it would not be long before we would be looking around for a market. It was the year before the hard frost. I had a thousand pounds over after the winter sale I anticipated a very large yield the next year, but it was a blank; nevertheless I have the information that I had written for. He sent me three samples of California honey, graded, with a very lengthy letter explaining the whole situation as to what I would have to do in order to compete against that honey, and figuring it up I found that the honey would have to be put on the Liverpool market at seven cents net. Since that year there has been the year with the hard frost, which made it a blank with me and I expect it did with a great many bee-keepers. I know that there were some apiarists in this meeting who are worse off than I was. Generally speaking, it was a hard year for bee-keepers, and therefore it made a scarcity of honey, and left it in that shape that we did not need to look for a market till we got a large flow again. I think we have had a large yield this last year, and I would just say that there is the difficulty. If next year the clover and basswood should give an ordinary yield we would have an enormous quantity of honey to dispose of in some way. The Liverpool market is in that shape, and I think we will have to compete with sage honey from California. I should judge that possibly that market might fluctuate—that is, the California supply. The most of the quotations that this gentleman gave me were from shipments that came round from Cape Horn in vessels. When the California honey came by the overland route, which made the freights very high and expensive, there was a little better price paid for it, but the bulk of the honey we have to compete against now is honey that goes around by Cape Horn in sailing vessels, netting seven cents a pound.

Mr. Gemmell: Can anyone give us some idea as to what it would cost us to lay it down in Liverpool? While in California I was told by quite a number of bee keepers

that they could deliver honey in Great Britain just as cheap as we could. If they can produce large quantities and can afford to lay it down for less money than we can it is going to be against us.

Mr. HOLTERMANN: The subject we are on is perhaps a little foreign to the paper, but it is one of very great importance. I will give you an experience we have had in connection with the British market. A Brantford firm have, within the last three months, since the 15th August, between what they have produced, purchased and resold, handled at least 60,000 pounds of honey. Now, you must remember that we have to buy that honey from the bee keepers and we have to wholesale it again. Our last experiment was to go to Toronto to the Pure Food Show; we thought it would be a good opportunity there to introduce honey to the public of Toronto. There we dropped $75 at least, so that it is not all profit. But as long as the business can stand experimenting we will occasionally drop a little money and will not kick too hard at it. A great many say, "If I get six cents net for my honey and sell my entire crop I will keep more bees." We are not properly organized in Canada, and proper efforts have not been made to distribute honey in centres where it is scarcer. In regard to the British market I remember meeting a gentleman in Ottawa who said he had made a special study of honey there and its values, and I have yet to see the man who says that we cannot get a large market in Great Britain and a better or as good a price as we are securing here. A man who has a diploma as an expert in Great Britain, and has been at a great many of the honey shows, and knows just exactly what the quality of British honey is, and what it is worth there, went back to England from Canada after the Toronto exhibition, and is now arranging to take orders and sell honey in Great Britain, and he is satisfied and convinced that that price can be secured. Mr. Holtermann then related some experiences which showed the difficulty of getting British firms to handle honey according to instructions as to grading, etc. We are thinking of again sending a small shipment of honey there. We think it will be successful, and the freight rate I got from Brantford to Liverpool the day I came down here was 58 cents, that is from Brantford. So you see that the freight rate is not so high, and, in addition to what I am telling you, I met a gentleman who lives in Hamburg the greater part of the year; they sell smoked salmon and other goods and have an extensive company in Quebec or Montreal. One of the partners is in the city of Hamburg; he understands the market there, and he says that he is satisfied that in Germany we can get an opening for Canadian honey. I did not believe that and I questioned him pretty strongly, but he is a solid business man. They sell a great deal of produce, and he says even there there is a good opening he is satisfied. That is just what there is before us at the present time, and the report of nearly all these men are that there is a very large opening in Great Britain. It is not a matter of how many pounds are sent to Great Britain, but they want a good article. What is sent from Australia and these other countries is not to be compared with our clover honey. If you take our clover honey and the British clover honey in a great many instances you could not tell any difference, and if we are prepared to put such an article on the British market we will develop a market, just as has been done in other lines. We are not discouraged. I do not think bee keepers have any reason to be discouraged; it is a matter of taking hold of this thing in a special way, let it be someone's special business to look after it, and I think the results will come.

Mr. DICKENSON: I think it is a mistake for any bee-keeper to put anything but No. 1 honey on the English market. It is sage honey in California. These samples of sage honey that I had sent to me from Liverpool came from California.

Mr. GEMMELL: That is white.

Mr. HOLTERMANN: In regard to California honey what they say is, first of all, it has a bad reputation there as to purity, and in the next place, what they get of California honey has what they call a minty flavor; our honey, I do not think, will need to come down to that level at all.

Mr. DICKENSON: Honey for exportation should be a No. 1 Clover. This honey I had sent me was first-class honey; it was of a nice flavor.

Mr. GEMMELL: Sage honey is.

Mr. McKNIGHT: Heather honey is as dark as golden syrup. It is a very peculiar article; there is no other honey like it. It cannot be extracted; there is that peculiarity about it; and notwithstanding that, it commands the highest price in the British market of any other honey. I am very much interested in this discussion, for the simple reason that over ten years ago a like discussion took place, both inside and outside of this Association. I am, perhaps, the only man here that has a personal knowledge of the British honey market, or at least, I had. At that time it was very strongly urged by some of our members that we should export our honey; and it was not only urged that we should export it, but that we should contribute a certain amount of our Government grant for that purpose. I opposed that, as some of you will remember, because I knew it would not be in the interests of honey producers of Ontario, knowing as I did what they might expect for their honey over there. I saw it would be a fatal thing indeed for them to undertake that. I was getting from 12½ to 15 cents a pound; I knew very well then, and I know it now, and my opinion expressed then is borne out by the evidence Mr. Holtermann gives you to day, what you can get for your honey in Great Britain—that you can sell all the honey that you want to send there. I knew then and I know now, that you cannot expect to get a return of more than seven cents a pound for it; you could not get it then and you cannot get it at the present day. Is it advisable under the present conditions to send your honey over there and take all the risk of sending it, take the risk of losing it entirely through a dishonest commission man, take the risk of b eakage and all the rest of it? Far better for you to sell your honey in Canada. I may add that there is an unlimited market in this country as far as our production goes. We are selling honey to the public to day and we sell them two pounds of honey for what they can get one pound of butter for, and if the matter is properly pushed you will find a sale for your honey. Everybody knows that the general consumption of honey in Canada is one hundred fold more than it was fifteen years ago, and I believe it will still go on My advice to you is, so long as you can find a satisfactory market at home sell your honey at home. I said I knew more about the condition of the British honey market than any man here. It is from personal experience Some of you know I was one of your representatives over there when we sent over that magnificent display, the finest that has ever been made in the world, the finest and the best that ever will be made in the world again in our day. I visited all the principal cities in England, Ireland and Scotland. When I was there I made it a special object to enquire as to the probability of an opening there for our honey. American honey at that time was sold, to my knowledge, on Market Lane by auction at twopence a pound, when we with our Canadian honey, after expending $2,000 in expenses returned to every man who sent a pound of it, ten cents a pound for their extracted honey, and paid them for their package as well. Not only that, but I went to the largest departmental store in Britain, (Lewis & Co. of Liverpool,) perhaps the largest in the world, and talked honey to the foreman He brought me down a two pound tin of California honey very nicely put up and it was very nice honey. I don't know whether it was sage honey or not. He told me he had bought that honey, and could get all of it that he wished to have at three pence halfpenny a pound, or about seven cents. I say again, and I repeat it to emphasize it, if you send honey to England you cannot, and you could not within the last ten years at any rate, expect to realize more than seven cents a pound on an average for it. Will it pay you to do that and take the risk of it? I think not. I never knew a pound of honey sold in this country under seven cents a pound.

Mr. HALL: You do not live in our district; we give them twenty pounds of buckwheat honey for the dollar.

Mr. McKNIGHT: That is the only return you have given to the public for all the money that has been contributed to help you along in your industry, that is the only advantage that the public has got for the public money that this Association has received, and they have been well paid for all they have contributed. They are entitled to something and they are getting it now in cheap honey and in good honey.

Mr. HOLTERMANN: We know perfectly well there are any amount of men in the room who are selling their honey and are very pleased if they can get wholesale, seven

cents, to sell it at that; and even in those days I know that honey was selling at six and seven cents, so I am right with Mr. McKnight in saying we have not begun to develop our Canadian market. We have paid too much attention entirely to producing, and we have let that part of the question take care of itself. We want to do more on that line, and I am with him right there, but at the same time do not let us ignore the British market or underestimate its value.

Mr. PICKETT: I think the first thing for us to do is to establish a character at home, let us get the confidence of our own people: When we have a very large surplus we can well afford to take a smaller sum for it. But under existing circumstance, I find the great difficulty is with the individual producers. Many of them have no character in the eyes of the public; not that they are not honest men, but they have not gone to the necessary trouble to establish a character for the article they have, and hence they cannot get the price. I do not sell one pound of honey under nine cents in bulk. I could not sell 12,000 at that, I do not suppose. I try among my neighbors and friends and sell to them at what I sell to others. Some sell to their neighbors for more than they can get from others; if that is the right way to treat a neighbor, and get his confidence I do not know it. I treat my neighbors as I do others, and they come to me for it and I get rid of the crop I have.

Mr. COUSE: Is the merchant in your village a neighbor as well as the farmer is?

Mr. PICKETT: My neighbor merchant in the village does not handle it at all.

Mr. COUSE: He would not handle it under those circumstances.

Mr. NEWTON: My thoughts agree with Mr. Pickett's. Although I do not go very extensively into extracted honey, I have not sold any less than nine cents. I have made an aim to establish that market, and to produce a good article and to satisfy all my customers, and I never sold any below nine cents in bulk; I always get ten cents retail for all the extracted honey I produce. I do not go into it very extensively, because I can turn over my comb honey into money far faster. I think we ought to start at home and educate all consumers round about us, and get them to eat it. I was speaking to a man and he was saying he got only seven cents for his honey. I sell it in twenty pound pails at $2.20, can and all; if they return the can I return them twenty cents; and most of my customers take it in twenty pound lots. Up to two years ago I never had a ten pound can in my yard. I educated them to buy by the twenty pound lots; but within the last two years some of them have been driven to ten pound lots. I suppose it will go down, but as long as people start at two pound jars it will continue that way, but if you try to educate them in the start to use twenty pounds, and put in their winter stores, I think they will keep on. Some of them order twenty, some forty and some fifty pounds at a time, and they pay me ten cents a pound for it; and as long as I am in business there I think I will have no trouble in getting the prices I have established. Outsiders will come in and sell for eight cents, but it does not affect me one particle, I can get rid of my crop at ten cents a pound.

Mr. HOSHAL: The discussion has drifted somewhat away from the question of the British market. Last season I had rather a surplus of extracted honey on hand. As an experiment of my own, and without any view of ever saying anything much to anybody about it, I sent some off to the old country market, to Liverpool, with the result that it netted me just about what it would bring here wholesale, somewhere between seven and eight cents; the honey I sent was basswood. I thought since in my own mind that that is a mistake, it should have been clover. Now, concerning our home market, there is one point I would like to emphasize about honey, and it is a point I carry out myself. When we place it in the stores, and expect a storekeeper to sell it for us or any other merchandise, we should be willing to pay him something for it. I really think when we do not do that we are cutting our own throats, and cutting our own prices. We should set the price ourselves on the honey, whatever it is, and then whenever we ask anybody to handle honey for us give them a trade discount, and hold rigidly to that.

Mr. BEST: Down east they put the market down, and they placed it at five and six cents. I did not wish to take that, and I am holding till the market comes up to

what I think I will take. I have some very good honey; and they sold good honey at five and six cents. The market is spoiled until there is a demand again. There has to be a demand to raise it again, either through scarcity or education, as Mr. Newton has said. I am aware that what these gentlemen state is correct in reference to the butter business; we have established a market, and we only sell what is ordered and we receive a good price for it. I have now considerable good extracted honey for sale, but I am not willing to take the prices that are offered.

Mr. Evans: I think one of the main points in selling honey is not to have any small packages; if a man gets one pound or two pounds it is eaten up at once, and he thinks it is precious stuff and he cannot afford to buy it. When he takes a good lot before he gets through he does not find it is quite so expensive, and he is satisfied to buy more. I think we have to thank ourselves very largely for the prices we have to take; I think the great difficulty is that bee keepers do not cultivate their own markets. I sell about a ton of honey every year within about three miles of my own place, and I get one dollar a pail for ten pound pails. I sell the stores some, but I find they sell very little; the people come to me. I am seven miles out of Toronto, but I cannot afford to sell it in Toronto. There is no doubt it is sold there at seven cents a pound. I was in a store at Toronto Junction a short time ago, and I asked the storekeeper eight cents a pound for it; he rushed around the counter and said, "Let us see what the quotation is in the papers." I knew the quotation in the Toronto papers was six cents a pound. I do not think it has ever been changed. I said, "Never mind the newspaper. You will find those quotations have been there for the last few years." If every bee keeper would sell around home, there would be very little to rush into the big cities, and then those low prices would not be quoted in the papers. I think the bee keepers made a big mistake when they agitated a few years ago that there should be quotations of the prices of honey published in the papors. I remember that being brought up in the Association. It would have been very much better for us if it never had come up; it injures us in selling our honey around home.

Mr. Newton: I omitted saying anything when I was speaking with regard to my retail trade at home. I may say that the stores in our village handle as much honey as my customers do. I allow them ten per cent. for selling; that is, I sell for nine cents instead of ten to them. We all know that there are people in the community who would not come to us to buy because they expect to pay cash for it; they go to the storekeeper and they expect to get it on credit. The men in the village have dealt with me ever since I have been in the business, and I have supplied them at nine cents and they have not kicked yet.

Mr. Brown: I have been shipping honey this last four or five years to Edinburgh, Scotland; we got seven cents a pound for it; but this year they could get California honey for a great deal less, so we have sold all our honey at home this year.

OUTLINE OF WORK DURING THE EXTRACTING SEASON.

By John Newton, Thamesford.

In running an apiary as I do part for comb and part for extracted honey, I usually select the strongest and best colonies for comb honey, and the rest are run for extracted honey. When the spring work has been done, such as clipping queens' wings, etc., and before the honey season opens, I see that my extracting combs and supers are clean and in proper shape for the honey season. My supers are the same size as my brood chambers, only one comb less is used. Eight combs $8\frac{1}{4}$" X $16\frac{1}{4}$" comprise my extracting super.

As the season opens, my supers and queen excluder are brought from the store room, the smoker is lighted, and the bees smoked, the excluder placed over the brood chamber and one super is put over the excluder on all colonies to be run for extracted honey and are strong enough to need room. After the honey flow fairly opens, I make it a rule to

see what is being done in the supers or colonies not yet having extra room, so that if more room is needed it may be given at once. Never allow a shortage of room for storing. In doing so two objects are desired: one is to discourage swarming from over crowding, and the other is to secure the greatest amount of surplus honey. I run all colonies two stories high. When super No. 1 is about $\frac{2}{3}$ full, it is raised and super No. 2 placed under it. I might say here for those who have not so many spare combs that it can be worked by extracting one-half of the combs at a time, always placing the combs with the most honey to the centre of the hives. By doing this, you will get well ripened honey, and it does not allow the bees to be over crowded, or in need of storing room. As the season advances, and in four or five days after you have placed on your second super, super No. 1 will be ready for extracting; but here let us be sure that our honey is well ripened before extracting. You all know the nectar which the bees collect from the flowers is thin and watery, and must be fully evaporated to make the best honey. The bee keeper should be equally wise, and not extract his honey until it is capped over. This requires a little more labor of uncapping, but then we get far superior honey and the wax for our trouble. We do not want honey that has been ripened artificially. All honey should be allowed to ripen in the hives; the honey will have a better body, and is superior in flavor.

Now we must see that our extracting and store-rooms are in good order, everything clean and tidy. When visitors come to see me, I never feel ashamed to show them into my extracting room; I know it won't disgust them, and have them go away saying, "I do not want to eat any extracted honey if every beekeeper is as dirty as Newton; it is not fit to eat". I have seen extracting rooms all daubed and sticky, and the bee keeper also. Let us put a good clean article on the market and command a good price. Have your extracting and store-rooms in good order, the extractor placed in position on a box or bench in good order and high enough to let a pail under the tap, the honey can the same in the store-room with your strainer screwed around the top, uncapping can placed in position, knife in good order, dish of warm water to place your knife in when not in use uncapping which will assist much with your work. My uncapping can is just an oblong box with a bent tin so as to drain the honey to one end and run it in a dish. My screen for holding the cappings is one of the screens of my solar wax extractor. When the screen is full, it is placed in the solar and another one put in its place, and if it is a nice sunny day the same night we will have no cappings to wash for vinegar, but they will be into nice yellow wax, and the honey which was in them can be placed in your store can none the worse for going through the solar. Now when everything is ready—the comb box, wheelbarrow, smoker going good—I proceed to the beeyard, and go around to those hives I wish to extract, placing the entrance blocks on, and giving a few puffs of smoke. This will cause an excitement and warm up the honey, and will greatly aid you in your extracting. We must be cautious not to give too much smoke, which injures the flavor of the honey. Now proceed to that part of the yard which you wish to start at, and after giving a few more puffs of smoke in the top, tear off your quilt, and take out one comb, placing it at the entrance so as to give you more room in the hive to shake and brush the bees from the combs, and prevent killing and making the bees angry, placing each comb as the bees are cleaned from them into your comb box. After all combs are out, close down hive, remove entrance blocks, and proceed to your extracting room, uncap and extract. A little caution must be taken in turning the extractor. Start slow, gradually getting up speed, and there is not much danger of breaking the combs.

After extracting, place the combs to one side until evening then replace them on the hives. If I was working as I mentioned before, extracting the half super at a time. I would carry a set of combs with me and replace them as soon as the full ones are taken out. After your day's extracting is over, and all honey is run into your store cans, cover up your extractor, uncapping dish, etc., so as to keep them clean, until you want them again, and thus I work on until the honey season is over. During the last extracting the bee tent is usually brought into use to prevent robbing. After the extracting season is finally over and all combs extraced, they are piled three high on hives with a quilt between the brood chamber and supers, with a corner turned back to allow the

bees to clean them up, or if placed in the yard some distance from bees, tiered up, and combs spaced to allow bees access to them, they will soon clean them up. But I prefer the former way, as it does not cause the same excitment. After combs are clean and sweet they are again placed in the store-room with a sheet of paper between each, until they are needed again the following spring.

Mr. EVANS: I would like to ask the object of putting blocks in the front of the hives when you are extracting.

Mr. NEWTON: I mentioned in my paper it was because it warmed up the honey somewhat, and greatly assisted us in extracting.

Mr. EVANS: Do you keep them there while you are shaking the bees off the other combs?

Mr. NEWTON: It is not necessary to remove them till I go to shut down my hives. When I shut down my hives, I just throw my blocks to one side. It could be done just as well before, but I shake my bees in my super and let them run down the combs; I do not shake them outside as some do.

Mr. COUSE: What about moths in your combs in setting them away?

Mr. NEWTON: I am not troubled with that.

Mr. HOLTERMAN: When do you set them away?

Mr. NEWTON: My combs were only put away about three weeks ago.

Mr. COUSE: But, provided you had set them away in August?

Mr. NEWTON: I would not like to do that; that is too early. They are generally piled up on the hives till after that, to be fully cleaned out.

Mr. COUSE: They could be cleaned out in a day.

Mr. NEWTON: You can, but that season of the year comes on when we are getting our honey ready for the market, and they are piled up and generally left there till after the fairs are over.

Mr. HOLTERMANN: Is not one object in keeping the combs on the hives so long that you avoid moths in that way?

Mr. NEWTON: Yes.

Mr. PICKETT: I think I noticed in the reading of the paper that he had sometimes replaced the combs with others in his extracting. Is it wise in these perilous times?

Mr. NEWTON: Of course, that is a mater of opinion between each of us in this room; as regards the foul brood question, it has been said that there may be a chance of spreading the disease through the yard in that way.

Mr. PICKETT: In 1884 I made the acquaintance more particularly of our now foul brood inspector, and since that time you do not catch me changing combs in a hive from one to another.

Mr. GEMMELL: It is a bad plan unless you know you are safe.

Mr. HOLMES: I have always practiced the interchange of combs throughout the whole yard. If it is the sense of this meeting that it is advisable to discontinue that sort of thing I am perfectly willing to fall in line.

Mr. NEWTON: When I was with Mr. Hall—I suppose I have gone in the same rut that he has in that line—we never opened a hive but what almost our first thought was, is there any foul brood here, (hear, hear,) and that has followed me to this day, I never open a hive but if I see a cell of dead brood I am anxious to see what it is.

Mr. PICKETT: Mr. Newton tells us that that he has two supers on the top of each of those hives. I suppose he does not go to the bottom of those every week, perhaps not oftener than once a month, and from the remarks that have been dropped here this morning about people bringing in bees into the vicinity and all around us, who knows but the very honey that is extracted from those frames is infected, and he is not the wiser for it. He may have escaped ten years, but he may not escape another year.

Mr. HALL: Time, with you, I expect, is valuable. Your plan is a good plan for safety, but it takes double the amount of labor, and if you had two hundred stocks of bees and no one to help you I guess you would not do it.

Mr. PICKETT: Sometimes I have one hundred and seventy-five and I do it. That is not the point at issue. A number of young men have joined our Association, and they are here listening to the remarks that are dropped; and some of the older members here are well acquainted with this foul brood. I am sorry I know it so well.

Mr. FRITH: The year I supposed I got foul brood was a year that I had taken a great deal of honey. In going around extracting you make the circle nearly every time; and I verily believe that I carried that foul brood from one colony alone into thirty others; I would go to this colony and take out the combs and put in a new set of combs, and do just the same as Mr. Newton does, and I would go and extract those and put them on to the next hives.

Mr. COUSE: What about bees that go from one hive to another, is there not as much danger?

Mr. FRITH: I believe that the contagion is carried in different ways; but I think the great medium through which contagion takes place is through the honey; the spores get in the honey.

Mr. MCEVOY: There is perhaps nine-tenths of the honey in colonies that is not diseased. Honey to get diseased must be stored in a stain marked cell, and in the time of a honey flow they move this honey to other parts and thus they spread it.

Mr. EDMONSON: How often do you examine the frames during the extracting season?

Mr. NEWTON: Never through the extracting season. But I have been thinking while Mr Pickett was speaking of this: Do you keep track of them from one fall to the next spring, and put them on the same hives again?

Mr. PICKETT: I have my hives labelled with a large label, and I have a small number put on with a pencil besides, and in the winter I lay the large label down on the stands where I take the hive off, and when I put them back in the spring I have only to look at the hive, and when I come to the label I get the right place.

Mr. NEWTON: It is the extracting combs I have reference to.

Mr. POST: When the season has closed do you allow each colony to clean its own combs?

Mr. PICKETT: They do largely; in a sense they clean them.

Mr. POST: If you have buckwheat honey you must have them thoroughly cleaned.

Mr. PICKETT: They are often left on the hive until they are taken out and put away, and then they are spread a certain distance apart, where they are stored.

Mr. SPARLING: Do you scald your extractor after extracting each super?

Mr. PICKETT: No, I do not. Someone has said the further he could keep away from danger the better; I try to keep away.

Mr. POST: If I allow my extracting frames to remain till I take them off in the fall the bees will cluster, and then there is sure to be honey in around the bees as late as that in the fall. How do you clean yours?

Mr. PICKETT: I have a stove in my honey room. They are left there for a few hours.

Mr. NEWTON: If you do not clean up those combs after they are extracted, what little is left in them will granulate, and that will go into the next season.

Mr. GEMMELL: He extracts them and puts them back on the hives to be cleaned up again. In leaving the supers on till late in the fall Mr. Post had a difficulty with the bees clustering in the upper storeys. Have you the same difficulty?

Mr. PICKETT: No.

Mr. DARLING: Do you have any trouble in inducing the bees to work in a super? If so how do you overcome the difficulty?

Mr. NEWTON: In some cases we do; I think we are all troubled with it once in a while. Of course, as I told you in my paper, I never put a super on until I think they need it. I mentioned that in my paper particularly. I do not go around my yard and put it on everyone at once. I put it on those that I think really need it; then, the rest are left until I think they are in proper condition to need it, and I think when they are left that way there is not much doubt that the bees will enter them quite readily.

Mr. COUSE: Do you put a card of brood up?

Mr. NEWTON: No.

Mr. MCEVOY: Mr. Newton works mostly for comb honey, and his uncapping box is arge enough for that, and the way he drains it all right, but if he had a hundred or more colonies of bees the uncapping arrangement is altogether too small.

Mr. HALL: Mr. Newton has given it to you very intelligently; it is the fault of you gentlemen that do not do as we do. Mr. Newton does not use any comb for extracting purposes that he uses in his brood nest; and all that Mr. Newton is connected with do not do it; they keep extracting combs for extracting purposes. Mr Newton does not want to put up the brood to coax his bees up, because he would have pollen there and his combs would not keep after he laid them aside. Mr. Newton's combs, when he does not use them, will be clean and free from moths; the only thing that will eat them is the mice.

Mr. DICKENSON: Mr. Newton says he goes to the hive and takes out the comb When I go to the hive I take off the super. I make sure that it is ready before I take it off and set it down; I turn over the cover and throw it upside down. My covers have flanges on, and I let it stay there and strip off the blanket. That, remember, is the first extracting. That rule does not apply when you are extracting for the last time. The bees will commence to leave that; sometimes they leave it sooner than others. Some strains of bees will leave quicker than others, but as a rule if you come back in about an hour you will find the bees are pretty well out. I come along with a wheelbarrow, and I put on three of those crates; if the bees have not all gone out I take them out, but I find frequently I can pick up ones that I do not have to take any bees out of.

Mr. NEWTON: With regard to your method, I would not like to do that. I think if I set down my honey and left it standing for an hour, and then took it to the extracting room and tried to throw it out, it would be like what I mentioned, sticky bee keepers and sticky honeymakers, because it would come out in strings. Mr. McEvoy sai t that if I had a couple of hundred hives for extracting, the way I used my cappings, my method would not answer. I would just have so many more solar wax extractors, and so many more screens and I would work it just the same if I had 200 as I would the way I am doing now. If you leave your cappings to the end of the season they get granulated, and if you wash them for vinegar you know what a work it is. Before night comes on my cappings are into wax, and there is no washing for vinegar.

Mr. DARLING: Do you not find that the heat of the solar extractor darkens the honey?

Mr. NEWTON: I do not—nothing that you could notice—if it is the right solar extractor and rightly fixed. The only difference I can see is that it is a little thicker.

Mr. COUSE: How do you do it?

Nr. NEWTON: My extractor is the same as Mr. McEvoy's. I think it should be shaded.

Mr. MCEVOY: Shift the tin under.

Mr. NEWTON: You cannot do it that way exactly.

Mr. DICKENSON: With regard to warming up those combs, that does not concern me at all; it is so warm in my honey house that I can hardly stand it.

Mr. HALL: That is in a warm day. We have to take our honey in October.

Mr. DICKENSON: I do not extract in October. I extract when my honey is ripe, when it is all capped. I have taken off five crates of well capped honey from one colony, but, of course, not at one time.

Mr. BEST: This paper reminds me very much of a man's orchard; he found a great number of sticks and stones under the best apple trees. I think this paper has brought out a great deal of discussion, and I am pleased to see that it has. The picking at the paper, I think, shows the good quality of it; and I think if the writer has a chance to express himself he will show the course that he has pursued has not been far astray.

Mr. DARLING: How do you shade the honey receptacle?

Mr. NEWTON: With a small piece of board, right on the dish or whatever it may be you are running your wax into; I just leave space enough for the drip to run into, and that is all that is seen.

Mr. DARLING: That is an idea that I had not thought of. I have the same extractor and it is a good one.

Mr. HALL: It saves you from doing any cooking.

Mr. MCEVOY: Do you get it colored?

Mr. DARLING: I have found the heat of the sun darkens my good honey. The heat of the solar extractor is the best antidote for the rank tast of buckwheat honey. If you take buckwheat honey cappings that have laid until they were granulated and put them in the solar extractor, the honey that comes down is of a nice mild flavor, but it is dark.

Mr. ALPAUGH: As I am the inventor of that extractor probably I can say something about it. If you run honey through it time and again without cleaning your screen or pan, it is going to color your honey more or less. You have got to keep the pan and screen perfectly clean, because every time you melt there is a kind of dark sediment or matter there; the next day that will heat up again, and honey passing over that will become discolored. You want your pan just as short as it can be made to catch the drip, so as not to allow it to pass over the dark metal that is under the screen. When I first made them I made them too long, and I have eventually shortened them up, and maybe those that some of the members have are still too long. I think Mr. Newton has given us a fine paper and something that may be of benefit. Keep everything clean round about your place; have a place for extracting in that your bees cannot get into and buzz around when you are working, and drop into the cans when you are filling them out of the tank, and so on. I called on a storekeeper in St. Thomas once to sell him some honey, and I was only asking eight cents wholesale. "Oh," said he, "I bought some honey the other day at seven." I said that I would like, out of curiosity, to see the quality of it. He brought out a can. He had just got them the day before and had not opened them. When I looked in I could not see the honey for drowned bees. There is one exhibition of carelessness in putting honey on the market in that state, that would disgust any consumer. People would not think of looking at any honey if they always got it like that. With regard to putting the extracting combs back, I have done both ways. I have kept them off till evening, which I always do in robbing time, if there is any inclination to rob. If I am scant of supers I put them back when extracting; if I have plenty I take two top stories off each hive, or three off the small ones. I believe it is better to leave them off till evening. If you do not put them back they will go on with their work just as soon as you close the hive, and they can do this work at night when they cannot gather.

Mr. DARLING: With regard to darkening the honey, Mr. Alpaugh said if we do not keep our wax basket or screen clean and if we do not keep the Russian iron screen clean, we will have darkened honey. I do not like Russian iron, and I will tell you why: I do not care how careful you are with it, there is a certain amount of acid in honey, and when it gets on the iron it has an effect upon it. The first thing you know, there is some darkened honey coming from that, and it has an irony taste, just the same as if you store honey in a tin can with the tin off in some places.

Mr. ALPAUGH: Did you ever try painting your drip pan where the honey drops on it? Give it a coat of dark paint such as they paint buggies with.

Mr. DARLING: I thought of trying tin in the place of iron. There is this difficulty about it, the tin throws back the heat and it is naturally colder, and the wax will cool on that tin wherever the sun does not strike fairly on it. The iron takes the heat, and holds it and it becomes so hot that it will burn your hand. We have to use the sheet iron, but we have to be extremely careful with it. My extractor, which is made after Mr. Alpaugh's invention, has the bottom edge of it cut off in order to prevent a large space that is in the shade, and my pan is made to slant at the top. It is just wide enough so that when I bring it from under one point of the pan I can lift it up at the other. I only shove it far enough under that pan to catch the drip; I just have room enough to draw it back in order to pass this point easily. The idea of putting a cover on to keep the heat out of the pan had never occurred to me. I think that is a good idea, and I shall adopt it in the future, thanking Mr. Newton for the information. If we wish to have our honey clean and good, and do not wish to have an irony taste, we have got to not only be careful about dirt and propolis that comes more or less from the wax, but we have got to keep the pan clean.

Mr. HALL: Mr. Darling, I presume, has a wife and family, and they put down preserves. When he goes home let him make it flat on the bottom so that his wife can make her preserves on that extractor. If she once makes him a lot of preserves in the wax extractor instead of using her cooking stove he will have all the neighbors around saying, "How do you do it?" Your wax extractor is the best thing for making preserves.

Mr. DARLING: My extractor is flat on the bottom, and it is square on the bottom. There is just about ten inches cut off the corner.

Mr. HALL: Is there room to put in a dozen jars of fruit?

Mr. DARLING: Yes.

Mr. HALL: You don't need to alter it then.

Mr. MCKNIGHT: Have you found that honey taken from cappings is as a rule thinner than the general average of honey in the supers?

Mr. HALL: Yes, until after it passes through the solar, and then it is thicker.

Mr. ALPAUGH: If you use a honey knife dropped in water it will be thinner: if you do not it will be just as thick if not thicker.

Mr. DARLING: I have never used a knife dropped in water.

Mr. ALPAUGH: I invariably use a knife dry.

Mr. NEWTON: I would like to stand in with Mr. Alpaugh. I did not think to mention it as regards having the extractor perfectly clean. Mr. Chrysler is behind me, and he whispers in my ear about solar wax extractors coloring the wax. It will be just the same as Mr. Alpaugh spoke of if you do not keep your screen clean. I always have a rag underneath my extractor, and I never turn it to the sun without rubbing the tin and also the glass at the same time, and then everything is perfectly clean. After melting my wax I throw my screen down and pour water on it to clean the screen.

Mr. CHRYSLER: If your wax is not shaded, and it is allowed to remain from day to day in the receptable, and the sun gets at it, it will turn the wax dark.

Mr. NEWTON: I hope there are no bee keepers who do that. We need our solar to put it in use instead of leaving the wax in there day after day.

Mr. CHRYSLER: It will make it a grey color.

Mr. DARLING: It looks as though a man had stirred it up and put a little lamp black in it.

HARVESTING COMB HONEY.

By J. B. Hall, Woodstock.

I will make a few statements of facts as I find them in the apiary.

1st. For the production or harvesting honey, be it comb or extracted, we must have bees, and for producing comb honey in sections the right strain of bees must be kept. By the right strain I mean bees that are great gatherers of honey, and are not afraid to leave the brood nest to store it; that will fill the brood combs to the top bar with brood; that will build combs without the use of brace combs; that will fill the sections to the wood all around, and are not afraid to cap it when full. The above qualities can be and are kept, but it requires constant culling out of undesirable stock.

2nd. The hive has not much to do with the securing of a large and choice crop of section honey. I do not want a small hive, except the bees swarm; in that case I want it contracted for seven days. Our friends the manufacturers and patentees tell us great things about the choice of dwellings for our bees, and most likely say what they think is true, but we must not forget that they are making their bread and butter, not from the production of honey, and we must take their advice with a deal of caution.

3rd. See that the bees have an abundance of stores to last them until the main honey flow, and be sure and do this in September and give them a good letting alone until fruit bloom. This is the right time to unite any stocks that will not be strong enough for the honey flow, always keeping the best of the queens when uniting.

4th. Fill the sections with suitable foundation. Here again it becomes us to go very cautiously, and it will be well that we read the report given to the Ontario Association at Toronto, in 1896, of experiments made at the Dominion Experimental Farm, Ottawa. Certain kinds of foundation are lauded so profusely, and we are told by those interested that we make a great mistake if we do not use the patent or other makes. Do not use tough foundation, as the bees will not accept or work it out as readily as that which is more brittle. Perhaps they cannot get hold of the wax, the grain being broken by the stretching or kneading it gets passing through the process of making.

5th. To secure a crop there must be a honey flow, and we must know about what time or date it will commence, and its duration and govern ourselves accordingly. Now is the time to use our judgment aright. Give the supers as soon as the bees will occupy them, and as fast as needed, and not before or faster; just keeping a little in advance of the storing by the bees, and if you want the cappings to be fancy white, take supers off as soon as the honey is capped.

Neatness and cleanliness will be great factors in producing choice comb honey.

Mr Holtermann: We want to see the section with the fishbone. We do not want to educate the bee keepers wrongly about the thickness of foundation.

Mr. Hall: This is simply to show that they thin it down: it is not to show it is thinner than anything else, or it is not to show it is as thin as the natural comb, because it is not. The grain is not broken and they can get hold of it.

Mr. Smith: Is that the usual weight of foundation that is used?

Mr. Hall: Some of it is lighter and some of it is heavier. I have no special arrangement for dipping the wax. It passes through the mill, and if one sheet happens to be a little heavier than another it gets into the walls. It is the machine that makes it, it is not pressed out of all countenance; it is not like butter that some women work and work over till it is killed, and it is nothing but grease. I am not puffing up that machine, I am simply making my own foundation, because these other fellows will not make it to please me.

Mr. Holtermann: When you melt the wax you have destroyed the natural granule of it already, just as when you melt butter you have destroyed the natural granules of the butter.

Mr. HALL: If you take the wax and break it open it looks like a piece of maple sugar—full of grains.

Mr. GEMMELL: I think anyone breaking a cake of wax will find that. Would it not be a good idea to take a vote as to who use thick and thin foundation?

Mr. HALL: It is not that, it is the mode of making it. The Ottawa tests just fall in line with my experience. I had no idea Mr. Shutt was to be here last night or was to speak upon that subject.

Mr. HOLTERMANN: Mr. Shutt admits that they ignored in their tests whatever advantage or disadvantage there is in thin or thick septums. I can very well understand that.

Mr. HALL: Mr. Shutt did not know that we had a more important part to fill with foundation than getting the bees to use it all. He has not taken that into consideration at all. He was studying on an entirely different line. He was quite right as far as he went. I was a little surprised he did not kick about the size of the hive. I told you I did not want a small hive. There are eight of these in a hive (Mr. Hall produces frame). Eight very often are not big enough for all the bees. Eight of these are equal to eleven Langstroth frames. We want to get the frames full of brood, and those that have kept bees will perhaps understand it.

Mr. HOSHAL: How deep is this?

Mr. HALL: Ten inches by eighteen and a quarter inside. The hive has but precious e to do with it.

Mr. HOSHAL: If that was turned up the other way would the hive have anything o do with the taking of the honey?

Mr. HALL: No, only I would have to take it off the sides instead of the top.

Mr. HOSHAL: I generally take it off the top.

Mr. HALL: So do I.

Mr. FRITH: Doolittle takes just as nice honey off the sides.

Mr. SPARLING: Not now, I think.

Mr. HALL: I have fifty hives such as Mr. Hoshal uses.

Mr. HOSHAL: That frame shows plainly enough that it has been full of brood right to the top bar.

Mr. HALL: I can't keep bees that will not do that. I want them to fill the brood frame full to the top with brood. Some of you might doubt it, and that is why I brought it down.

Mr HOSHAL: In the production of honey there are two important things, one is the bees; there is no two ways about it, there is as much difference in the working qualities of bees as in the milking qualities of cows. There are strains of bees that will crowd their brood chambers; and other strains again will go up into the sections and work there; but, on the other hand, the shape of your hive has something to do with the amount of honey that is stored above the brood. If you take honey from a super above the brood chamber your hive has something to do with the honey that is stored. I contend that if Mr. Hall builds two hives, one broad and shallow, and the other narrow and deep, that the deeper hive will be more likely to have honey stored at the top than the shallow one will, all other things being equal. If he has bees that are liable to store honey in the brood chamber, those that are in shallow hives will have less of it about the top than those that are in the deep hives. One important feature I do contend is, with that so shaped there is a tendency to throw the brood to the top of the hive. Another thing about the top of the hive is this, as far as hives have anything to do with it, you take a broad shallow hive and you will get more surface on top for storing.

Mr. DARLING: I use two hives; I use the Jones hive and what they call the Combination hive; the Jones hive has the frame deep and narrow; the Combination hive has the same sized frame but it hangs the other way.

Mr. HALL: It is in the strain of bees, as I tell you. I want a strain of bees that will fill it up to the top, and fill it full. I want a strain of bees that will not put all the honey below. And I want a strain of bees that will gather a lot of it. That frame has been used for five or six years; look at the brace combs on it.

Mr. DARLING: There is another thing connected with brace combs that is just about as bad as that, and that is propolis.

Mr. HALL: Kill the bees that gather propolis.

Mr. DARLING: Some years ago Mr. Hall made me a present of a queen from a good colony. She was a fine looking specimen, and she produced fine looking progeny while she came from a colony that had very little to do with propolis; when they got into my yard they propolized so bad I have had to take a knife and scrape it off.

Mr. SMITH: I would like to ask Mr. Hall if he considers that frame a very good size?

Mr. HALL: I said nothing about it.

Mr. SMITH: Do you not think if there was about an inch or two cut off the bottom of that hive that the comb would be brought down and fastened to the bottom better?

Mr. HALL: I use a frame with four inches cut off the bottom.

Mr. SMITH: You use these, too.

Mr. HALL: Yes. I am going to use some new hives and they are to be new Heddens. I have got enough bees, but I cannot work without some empty vessels. I find the new Hedden hive a good hive, but I think there is a better hive than mine. Mr. Emigh has a better hive, according to my judgment, than either of what I use.

Mr. MCEVOY: Suppose you had a lot of Jones' hives, the old make, with large brood chambers. and there was about four inches of honey at the top, what would you do in a case of that kind?

Mr. HALL: I go through them in fruit bloom for clipping the queens. I have clipped my queens since 1873. I did it then because I was not at home to look after the swarms when they came out. And when I am looking after that I look after every other prosperity of the hive. The first thing, even before the queen is hunted for, is a search for foul brood. I turn every comb right over to look to see if there is any dead brood of any kind. I was so scorched in 1875, that it has left an impression on me, and I cannot open a hive without looking at it. If I live to be a thousand years old I will not forget it. When I get through with that and find frames with honey at the top I have a large knife I call an uncapping knife, and I give it a shave on each side, and I put that right in the middle of the brood nest, and if you go there a few minutes after that you will find it all cleaned out, and you will find it full of eggs. Having got it full of eggs, you can keep it all season.

Mr. HOSHAL: There is another little point in connection with hives; I do not know whether I am put down as the advocate of any particular hive or not; but I suppose a am. I agree with Mr. Hall that the hive has nothing to do with the securing of our crop of honey in a sense. The system he follows, as far as it takes up the year's work in an apiary, is exactly the same as I do myself. He accomplishes the same result; that is, getting the brood chamber filled with brood. Ido exactly the same thing. But with respect to the hives there is just this about it, I do put my management first. There is a certain system of management which I map out, as there are certain results I want to accomplish with my bees; there are certain conditions Iwant to put them in, in order to have them do their best work. There are two systems, either by manipulating our frames or manipulating our cases. We can get at it both ways; but my choice is for that system of management by which we manipulate our bees through cases instead of frames. In carrying out that management the Hedden hive works the best.

Mr. HALL: As a bee keeper I have something else to do in the apiary besides arranging the hives for honey. I have to take the honey and the swarms. I have to see that the young queens are laying, and I have to clip them. I have to pile the hives up and lift them, and various other things. These must all be considered. I have fifty of the Hedden hives, and I like them so well that I am going to get some more. They are standing side by side with these large hives. I suppose you call them large; they do not look large to me; I have used them all my bee life, and they please me exceedingly. That frame simply has an inch plump top bar, and to get stiffness we have a tongue on it to keep it from settling; and now that I have got a top bar to that Hedden hive to keep it from settling I can get rid of the brace combs. That is the second addition I made to the Hedden hives. The first addition I made—merely putting the metal with the wood—caused a fight all over the continent of America, and I just kept mum and let them fight about it.

Mr. GEMMELL: That is the honey board?

Mr. HALL: Yes. But the Hedden hive is a very nice hive. I do not say that any hive is the best in the world, but I stick to what I said formerly in my paper, that the hive has very little to do with it; it is mainly your management. Some people ride in a waggon without springs all their lives and think it is delightful; others are not satisfied with that, they want to have springs. Let them please themselves. When I was young and supple I could get around, and it made very little difference how much work there was; but now I don't want much work.

Mr. GEMMELL: I am going to ask Mr. Hall if the reason he like Hedden hives is because he can get the brood at the top bar with less manipulation than he can with the others; is that the reason why he prefers it?

Mr. HALL: I do not prefer it.

Mr. GEMMELL: Is that one reason why you like it?

Mr. HALL: That is one of the reasons; but it is no harder for me to get the brood up to the top bar of the large one than the small one if you take into consideration the clipping of the queen. It is all done at the same time.

Mr. MCEVOY: Why are you going to order some more new Hedden hives?

Mr. HALL: Because I want more to work with. In other words, I could work them together as nicely as possible, although one is two and a half inches longer than the other, but I want something to work with; I do not want any increase, but I want something that will give me less labor so that I can attend to them when I have time. I am not young, and I cannot get around twenty hours out of the twenty-four.

Mr. HOLTERMANN: I think Mr. Hall advocates a certain hive quite as much as anybody else I have heard of, and I will say quite candidly, as far as I am concerned, I do not know what is the best hive. There is only this particular feature about it, by having a standard hive you can get fittings and appliances for it from almost anyone; you can buy or sell that certain hive more readily than any other, and along those lines and for those reasons, if that is a hive within reason, and if it does not matter what kind of a hive you have, I certainly would take that hive that is used to the greatest extent. I care a great deal more for the super appliances and the equipment than the body of the hive.

FINANCIAL STATEMENT.

The financial statement, which appears on page 6, was then read.

Mr. PICKETT moved, seconded by Mr. MCKNIGHT, that the report be adopted. Carried.

REPORT OF COMMITTEE ON FREIGHT RATES.

Mr. GEMMELL reported for the Committee on Freight Rates as follows: I waited on Mr. Earles, the general freight agent, and I gave him all the suggestions I could with regard to having the frieght rates reduced and the reasons for it, and Mr. Holtermann did the same thing, and the result was that we had the rates lowered.

Mr. HOLTERMANN: With regard to boxed honey, which covers a large proportion of our shipments, in the sixty pound cans, the classification was reduced one. We did not succeed in getting the classification reduced on honey in barrels, but I think there is still some hope of doing something. I may add to that that I wrote to Prof. Robertson, who is the Commissioner of Agriculture of the Dominion, and I understand that it is probable that a committee may be appointed to take up this entire question of freight rates by the Dominion Government, and if you see fit to re-appoint your committee to try and do something further there, as far as I am concerned I will be pleased to do what I can. I do not think we should relax our efforts in that direction, because it is exceedingly important in the marketing of honey.

Mr. GEMMELL: I might say that Mr. Earles was quite pleased to receive us, and said he would do all in his power to have the thing done. He said he was very anxious that we should be placed in the same position as any other class of people shipping over the road.

Mr. SHAVER moved, seconded by Mr. POST, that the verbal report of the Committee on Freight Rates be received and adopted. Carried.

ELECTION OF OFFICERS.

The election of officers was then proceeded with, and resulted as given on page 3.

THE CANADIAN BEE JOURNAL.

Mr. J. D. EVANS moved, seconded by Mr. C. W. POST, that it be a recommendation to the directors to supply each member with a copy of the *Canadian Bee Journal*.

President HOLMES put the motion, which, on a vote having been taken, was declared carried.

DISCUSSION ON HOW TO MAKE THE ASSOCIATION MORE USEFUL.

Mr. DARLING: In starting a discussion of this nature, the field is so wide and the subjects so varied that we might take up nearly half a day, perhaps a whole day, and then not exhaust the subject. I will mention a few things that it would be better not to do, and which might bring up discussion. Prominent among these things is one which has cropped up incidentally this afternoon; I refer to the election of officers to fill certain positions. You know as well as I do there are institutions that are permanent in their character, whether moneyed institutions or otherwise, and when they get hold of a good man they keep him in the place in which they put him. I have heard it stated in this Association time after time, "pass the honors around." I do not consider we have any right to do it unless our abilities give us the right. I say it is a suicidal policy for this Association, or any association or society, to put men into responsible positions simply because somebody else wishes to see them there. Another thing, we ought not to allow our personal feelings to influence whatever we may take in hand for the benefit of the Association at large; we should be, as it were, one fragment of the whole and not an individual personality. Just as soon as I begin to look forward to my own personal

advancement, and try to get my own position bettered by climbing upon others and pulling them down, just so soon I am working against others. We should not take up the time of men who have travelled a greater or less distance at a greater or less expense by telling them simply about some theory that is going to make none of us any better. It is a waste of time and waste of the funds that have been placed at our disposal by the Government of this Province. I believe the work of this Association, as I stated in my address yesterday, lies very largely along the lines of education. There has been considerable discussion at times with regard to suppressing certain things for fear the public will get hold of the wrong end of the argument. I say the more we can enlighten the public and educate them with regard to any of these things the more we are going to help the bee-keeping industry. The more we can enlighten the public with regard to the profits there are in beekeeping the better for those engaged in the pursuit. Too many persons go in and lose all they put into it. I do not wish to keep the business to myself, and if I did I would have to make more than I have in the past or I would not get rich. The sooner nine out of ten of those persons who like to eat honey find out that they can buy it cheaper than they can raise it, the sooner we will get something for what we sell. We have got before us a vast amount of work ; we are just entering upon our usefulness to the Province. If we can manage to maintain the hold that we have we must increase our membership very much ; it ought to be doubled or tripled or quadrupled, and I think it would be if every one of us took hold of it in a right spirit and did what we could for it, but we have to begin at the bottom. Too many people are unwilling to spend a single dollar in membership fees to help along the work of this Association or of the affiliated societies.

Mr. FRITH : I like the idea of the suggestion as to how to make the Association more useful. I hold that when we become members of any corporation, that corporation becomes an individual, so to speak, and our being constituent members of that corporation, we are bound to carry out the objects as far as lies in our power, and to make it useful. We have in the Dominion of Canada five hundred thousand colonies of bees. This year we have produced twenty-nine million pounds of honey in the Dominion of Canada—six pounds to every boy, woman, child and man in this Province—and it is necessary that when new men and boys and girls intend going into bee-keeping to get them as well informed in regard to the industry as possible, because I know we are in dangerous circumstances in regard to foul brood. If everybody got foul brood and suffered from it as much as I did, you would wish you had never seen it ; you would wish it was beyond the seas, beyond the northern seas at that, and I feel along this one line that we as members of this Association are bound to disseminate this knowledge as far as we can. Another thing would be the development of our markets—to establish a home market—and this can only be done by distributing our own honey and selling it at the best prices we can get. I base our total yield upon our average for the Province of Ontario, forty-seven pounds per colony. In the last census for this country we produced five and three-quarter million pounds, and it was the worst year we have had, in my knowledge. The average was only ten pounds, both comb and extracted, throughout the Dominion. Then, holding that we have as many colonies of bees to-day as we had that year, and I know we have a great many more, we have twenty-nine million pounds of honey to-day. If the census is taken to-day I believe it will be thirty-five millions. When we were down at Ottawa in 1893, we went early in the morning to the statistician's office. Next day I met Mr. Carpenter, and he had a little paper in his hand, and he says, " Frith, guess how many pounds of honey we have produced in the Dominion of Canada ? " I said, somewhere between three or five millions, basing it upon the production of honey in Oxford county. He then told me that they had placed the total yield of honey at five and three-quarter million pounds, an average of ten pounds to the colony, both comb and extracted. We are nominally the Ontario Bee-Keepers' Association, but I am commencing to find out that intrinsically we are the Dominion Association. Since we have been at Ottawa I find that in different parts of the Province, out through Manitoba and in a great part of the North-West Territories, this Association is spoken of almost as if it were the Dominion Association. We must bear the responsibility. We do a good deal of work that is done for the Dominion in initiating any-

thing that will be for the good of the society, or for the good of the industry, and we d it for the Dominion. The Dominion Government to-day is looking to this Association for suggestions. They want suggestions to carry out experiments. They come to this Association more than to the bee keepers of any other Province, and hence we must feel our responsibility.

QUESTION DRAWER.

Q What is the experience of the members with Carniolans as compared with Italians?

Mr. POST: This is the first season I ever tried Carniolan bees, and it is the poorest year I ever had. My experience with them was that they had more good qualities, and fewer bad qualities, than any race of bees I ever tried; they made more honey and built up stronger, and were more satisfactory to me than any bees I have ever tried.

Mr. EVANS: I would like to know from those who have had experience if they are easily distinguished from the ordinary black bee?

Mr. POST: They certainly are. Mine are quite distinctly banded, but it is a sort of chocolate colored band. You can mix them with black bees and readily pick them out again.

Mr. HALL: There is about the same difference as between the horse worth $700 and the horse worth $70—$70 for the Italians, and $700 for the Carniolans. I have had four importations from Munich. Even what I have stated is under-estimated. What I like is a Carniolan lady and an Italian gentleman, and the offspring from them.

Mr. CHRYSLER: I have had experience with Carniolans, and somebody has stated there was very little difference between the markings of the Carniolans and black bees. There is a great deal of difference, but there are black bees that look a great deal like Carniolans. There are different markings in black bees, as I have found in my locality, unless they should have been Carniolans imported a great many years ago. As to the honey gathering qualities of the Carniolans, I can speak well of them, also as to their long life and good wintering qualities. Their swarming propensities are a little more so than the Italians, but by regulating their entrance and giving them plenty of air in warm weather and several other discouragements to swarming, it can be reduced equal to any of the Italians that I have had. I have had them this year, and they have n swarmed at all; and I have had hives full of bees and they have given a good crop of honey—I will not say an extra crop, because I am not in an extra good locality for a very heavy crop. They have done well with me.

Mr. HALL: I may state that they are not all good. The lot I got the year before last were $50 worse than nothing; they were very lazy, did not breed up fast, did not gather honey; they were just as pretty bees as any I had received previously, but they were of no use. It is not so much in the breed of the bee as it is in the strain. I think the strain of the bee has more to do with it than the breed. I think we make a great mistake if we do not select our own best stocks to raise our increase from. I had a queen in the spring which I marked last fall for raising queens in 1897. They swarmed about the 4th June. I calculated to save all the cells I could from this queen, and when I went into it about four days after swarming I found I could save eleven cells. Eight frames will not take eleven cells, so I went to another worthless stock of bees and took all its brood from it. I grafted cells into eleven combs intending to make eleven nuclei of them. A few days after that I found one queen had hatched out and destroyed all her sisters; and that of course upset all my calculations. We shook the bees off the top one and made some other use of it. I put on two of these little supers to start with, and before we got finished we got tens and twelves on. I may say they gave us 120 sections. The queen that I had laid aside for queen raising was four years old. I am unning the risk of wintering her, and if she lives I will raise some more. She is a mix ure of Carniolan and Italian as far as I know. If there is any other mixture it has

come from the drones of my neighbors. But I prefer for my own beekeeping a mixture of Carniolan and Italian, and I may say that I have had a number of imported Italian queens, and none of them satisfactory. I may also state that I have never been satisfied with but two of the imported queens—one was pure Carniolan and the other hybrid. My first queen only lived six weeks. I saved some forty queens from her, and I think seventy-five per cent. of those queens took after their mother; they were gentle, prolific, great honey gatherers and beautiful comb builders, not propolizers. I was so well pleased that I was very sorry the old queen had died, and on her strength I ordered another one from across the ocean, and there is light tinge of yellow blood in it. I think it must have been Cyprian, because they are nasty stinging things. The next year I got another one and it turned out about the same.

Mr. FRITH: Still you are satisfied with thoroughbred Carniolans.

Mr. HALL: I am satisfied with the mixtures; I do not want them thoroughbred of either.

Mr. PICKETT: If I were going to you for advice to purchase bees, with what knowledge you are possessed of would you advise me to buy pure Carniolans, or would you advise me to buy hybrids, or would you advise me to take Italians?

Mr. HALL: That all depends upon what race of bees you had. If you had pure Italians, or even other grades, at home I should advise you to buy pure Carniolans, and raise drones from those Carniolans, and queens from what you knew was your choicest stock in the yard. I would not advise you to buy Italian under any consideration. I am only speaking of my experience. It is the hybrid cross I want.

Mr. FRITH: You have found that equal to any cross you have ever had?

Mr. HALL: With the exception of this one I got from a man in Michigan. I got two, and I pinched the head off one as soon as I got it; another turned out to be a choice queen; she was worth fifty dollars to any one who wanted to breed queens for themselves.

Mr. DARLING: If you had a yard filled with hybrids, some Carniolan, some Italian, and a good deal of Black, and you were going to change those queens, what race would you put in to start with?

Mr. HALL: I would import one of each kind and raise 'drones from them. You should raise queens from your own stock because you cannot control the drones, they go out to camp meetings, etc.

Mr. CRAIG: Have you noticed anything peculiar in the comb-building propensities of the Carniolan?

Mr. HALL: I must say all the Carniolans, even the last miserable thing I got, are beautiful comb builders, but I am not satisfied with half an hour's work for a day's work; that is the objection I had; they wouldn't give me decent sections of honey within a reasonable time.

Mr. DARLING: Do they cap the honey with an air space under the capping?

Mr. HALL: It is beautiful capping. I have not a genuine Black; I have never kept a pure breed of bees in my apiary. I started with hybrids between Blacks and Italians, and I have introduced others. People come into my yard and say, "What a beautiful Italian apiary you have got." I don't know that I have. I keep bees for honey only, and I do not sell anything but honey, and I want bees to give me a hundred and forty or a hundred and fifty sections of honey.

Mr. BEST: Are your Carniolans grey?

Mr. HALL: They are the color of the Black, with the exception that the miller has been among them; and they have twice the number of hairs on them that the Black had, especially the drones, which are woolly fellows.

Mr. CRAIG: The reason I asked about the comb-building was because I understood that Carniolans when hived on starters, which some people practice, instead of building like Italians run it in streaks, zig-zag, without anything like a definite comb.

Mr. HALL: I have no doubt that is true of these identical bees they happen to have, but that is not characteristic of the race. I have a number of combs built from starters, and they are built as prettily as the combs of those cross-bred bees. I have not a pure race of bees at all.

Mr. FRITH: Have you any, Mr. Newton?

Mr. NEWTON: No, I can't say anything on this subject at all; I don't know anything about it.

Mr. FRITH: In the last stages of my bee-keeping I had sent away for a Carniolan, and it arrived two or three days after my disaster. I introduced her, but I moved away to the west immediately, and I cannot give any particular points. I was very much pleased when I returned home from the west and saw the bees and what they had done. I sold them the following spring, and had no chance of knowing. I would like to know, for I have kept them in my mind ever since.

Mr. HALL: I found the bees of the first and last queens were just as gentle as any I ever had.

Mr. FRITH: Mr. Hall has given his experience in regard to hybrids. I would like to know if any other person has had experience in hybrid Carniolans. I know that a hybrid is far preferable to a thoroughbred, and I can prove that in the poultry business; we produce a great many more new laid eggs with them, especially during the winter, and I find that the hybrid, from certain crosses on both sides, will produce far more eggs during the winter than some others. I find the same thing in pork-raising and in dairying, and I also find it so in the bee business. If the Carniolan crosses are better than any others, I want to know it; and this is a thing that ought to be carried on at the Experimental Farm. It stands on record to-day in the pork department at Ottawa that certain crosses in pork are over and above everything thoroughbred, or any crosses of any other description, or the reverse cross, by a materially large percentage in favor of one cross over and above every other. If this Carniolan cross is in any way preferable to the old crosses of Italian and our common bees, or of several others that have been tried, the Cyprians and so on, I would like to know it. Has anybody had any experience in regard to the *vice versa* cross, the sire on the opposite side, with a Carniolan mother, and a cross the other way?

Mr. HALL: The reason I prefer crossing in the way I do is because I want to find the queen once a year. The Carniolan queen is the same color as the Black queen; the only difference is that she stays on the comb while the others hide. I want the yellow bees on account of the clipping, I can see them so much easier; that is why I prefer the male from the Carniolan and the female from the Italian.

Mr. POST: Do you not think the Carniolan queens lay better than the Italians?

Mr. HALL: Yes, I find them better; I find them too good sometimes.

Mr. POST: If you had a good flow of buckwheat honey they would not be a bit too good.

Mr. BEAUPRE: Perhaps the mixture I have of Carniolan is something like the one that Mr. Hall tells us he pinched the head off. My experience is different from his. Two or three years ago I had nearly thoroughbred Italians, and I was well pleased with them and they seemed quite gentle, but a neighbor of mine introduced the Carniolan, and now they are mixed pretty thoroughly with mine, and I find them very vicious and bad to handle; but they are swarmers, and of course they are very prolific—too prolific. They seem to brood right up to almost snow-flying; and in swarming time I have had trouble in swarming them, because the queen will fly back on the limb very often if you shake them off. Of course I have not done any clipping, I am a young bee-keeper you might say.

Mr. EVANS: Would it be any advantage in wintering bees, especially where the combs are not wired, to have an inch standard or centre with the bee space sawed out of it?

Mr. McEvoy: About twenty or twenty-five years ago we cut a hole through the centre of the comb, but that has gone out of practice. We do not consider it necessary now to get these combs filled pretty well with sealed honey. With a proper frame we can winter them the coldest winter in this part of the Province without cutting through; but if there was a blank in the centre, only part of the honey is along here [indicates] and the wall of the hive. In severe winter weather, a little further north, then what Mr. Evans spoke about would come in. It would be a cross road—that would be the only advantage.

Mr. Hall: In cold climates use the Hedden hive and use two storeys, and then you have an opening from side to side half way up from the bottom board and half way down from the roof, and they can contract and expand at their pleasure. When I can get them out on the first of March, if I can put out a big hive with the cushion on top of it and with the sunshine, those with half an inch cover in the cold weather come up faster and brood up faster; they seem to drink in what little sunshine there may be. With regard to cutting a hole through, I think you will find your bees will die within two inches of that hole, from being isolated.

Mr. Darling: They will die within one inch of the hole—that I know.

Mr. Post: I have no experience with the Hedden hives, but I like combs perforated for outdoor wintering, and the packing down tight on the top of the frames.

Mr. McEvoy: What Mr. Evans spoke of with regard to these standards and the bee space in the centre, would certainly come very handy for outdoor work, only it would be extra work; that would be just in keeping with the Hedden hive.

Mr. Hoshal: I have never tried it, but it seems to me with a space up and down that way, the bees in contracting as cold weather comes on of necessity contract towards that bee space; they may be clustering on the end of the frame, and the contracting of the colony would be a little towards the end or centre cluster, half way between the end and that centre. The bulk of your honey will be in the upper case, and the bees will be clustering just along in this empty space all the way through, no matter whether they cluster towards the end or sides.

Mr. Hall: I have a strong suspicion that that is so.

Mr. McEvoy: If you fill up the centre they do not need a hole cut through at all.

Mr. Holtermann: I think that is where the great advantage of the Hedden hive comes in, in that it has that space in which the bees can expand or contract in clustering. I believe it is a very great advantage if inside of your hive you bore a hole. You can close that hole up by means of a plug that has a string attached to it, so that when the plug is in by taking hold of the string you can draw out the plug; you have a knife or something on the principle of a butter tester. The bees will fill up these holes during the summer unless you put a tin rim about them and make them small. Every time you cut this hole there is a liability of the bees building in drone comb in this space. Cut those passages in the fall of the year; have this instrument, pull out the plug and put it in, gradually working around with the blade of the knife on the principle of the butter tester, and by means of that you cut out the comb. Have some hot water with you, and have your knife warm as you work, and in that way you can make a very nice job of it and take out exactly the same space every year.

Mr. Evans: Would there be a danger of clipping the queen?

Mr. Holtermann: There is a danger of doing that, but if you do it carefully, and work it in gradually, the bees will get out of the way of your instrument and the risk is reduced to a small point indeed. I do not wish to give this as original. When Mr. Pettit wintered outside he always cut the winter passages, and did it in that way.

Mr. McEvoy: I would like those present to tell me about how much more section honey they get by filling the sections full of foundation than by using starters.

Mr. Best: My opinion is just about double.

Mr. Newton: I can only say I don't know.

Mr. Post : I have tried everything from starters to full sheets, and I certainly think you get about 100 per cent. more honey.

Mr. Hall : I do not know. When I first got foundation I read the books, and they told me to put in a three cornered piece of wax and put it on the top and I was fool enough to take that advice. I put some in the brood nest that year, and I was afraid to look at it for fear it would fall down.

Mr. Emigh : I could not answer the question, and I have never used anything except full sheets.

Mr. Sparling : I am in the same position, very much ; I have hardly used anything but full sheets, but I do not imagine you would get double the quantity. I think it would depend somewhat on the honey flow. I do not imagine that you would get double the quantity with full sheets that you would with starters.

Mr. Hall : We were short of foundation. You know in putting in five or six thousand sections of foundation there are some that will break off and leave a little strip across the top. I said, "We have no foundation, and in they go." We took off twenty-eight sections off the supers solidly sealed except this one section that had this strip across, and it was about half full of built comb, no sealing in it at all.

Mr. Hoshal : I am satisfied in my own mind that it did not pay to partially fill the sections with foundation. My experience, on a small scale, has been exactly what Mr. Hall has stated, that is in putting in on cases. A few of them were only partially filled, and others had full sheets of foundation in the sections ; and I would get those that were completely filled nicely built out and capped and finished up, but the others would be almost invariably as Mr. Hall says. Just how much more honey there would be in one than the other I do not know ; I am not prepared to say, but there is a marked difference.

Mr. Holtermann : There is a point that I do not think bee-keepers have paid enough attention to generally. It is not alone how much more honey they will get, but how much more is that article worth when you have got it. All things being equal, no man can compete in producing a quality of honey and not a full sheet, with a man who uses a full sheet. It is not alone what we generally consider a full sheet, but it is important to fill the section just as full as ever you can, without endangering the displacement of the sheet foundation ; by that I mean you want to have it just as close to the side and bottom as you can cut it without danger that it touches it and causes it to bulge. There are many who think they are using full sheets but they are not paying enough attention to that, and the result is, even if they are just as good bee-keepers in every other respect, they cannot get as good an output.

Mr. Newton : Mr. Holtermann took the words out of my mouth as regards the selling of the honey. I think that is one great object we have in using the full sheets, to show our honey in a different light from what we do in putting in starters. I remember going north to buy some comb honey, and the gentleman I went to buy from was in the habit of using those small starters ; I think I could say one-third of it was built with drone comb that did not look very nice as compared with the worker comb, and it spoiled the looks of it for the market, so I think the advantage in using the full sheets more than doubly repays us for doing so.

Mr. Post : There is one thing I would like to ask Mr. Hall. In placing your foundation in the section are you particular which side of the foundation you fasten? You know how to put foundation in brood chambers.

Mr. Hall : I put it in the same as that. People say, "How is it the bees always put the point of the cell upwards?" They say so because they do not know any better. They say, "How is it you always go contrary to the bees?" As I told you this afternoon, my wax is very brittle. I want it brittle, and if I put the point upwards it won't stand after we run it through our machine ; but if it is put the other way, with my foundation, it will stand upright. Then, again, it will not sag so much this way as it will the other ; that is why I put it on that way. But with general foundation—I saw some here this afternoon of Mr. Smith's—that will stand any way. I simply put it on that

way because it will stand, and it will not stretch after it is in. I do not know that there is any particular advantage in putting it one way or the other if you get certain brands of foundation, but that foundation would not stand in position, it would buckle the other way, and it will keep straight this way.

Mr. McEvoy: I find another drawback in starters, when you put the starters in at the top that way you cannot expect the bees to reach it, and they will fill in the brood chamber; but if you bring it down they run up and you get honey in the top chamber and you do not have the amount of swarming that takes place otherwise. It is business to fill the sections as full as possible. We get twice the amount of honey.

Mr. Holtermann: I did not like to say anything about the quantity of the honey. I do not believe you get twice as much honey. When we begin to talk about the production of comb honey I believe that we are making some pretty serious blunders.

Mr. McEvoy: I go further, and I will say you get three times the amount

Mr. Holtermann: We are apt to judge by what we get in the supers. When we are taking extracted honey we relieve the pressure from the brood chamber. The result is more honey is stored in the upper storey, but at the end of the season you can tell every colony you have run for comb honey, and for extracted honey. There is so much more honey in the colony that you have run for comb honey, because the accommodation has not been quite so liberal in the upper storey, and the result is people think they can produce a much larger percentage of extracted honey than comb honey. I believe if you say you can produce 65 pounds of comb honey where you can produce 100 of extracted you have gone just as far as you can go. When you say you can produce twice the quantity of comb honey with your foundation you are misleading again. I say that the bees, not having even as much accommodation as they had before, store a larger proportion in the lower storey, and what you do find is that there will be a greater tendency to swarm and take up the quantity of honey in the different hives. Speaking of this full sheet foundation, that is one place where you get the advantage with the new process of comb foundation. You say, "Ihave got to allow for sagging in the ordinary foundation." Use the new process and you have to allow nothing for sagging. You know where you are, right at the start; that is a very important thing.

Mr. Newton: Mr. Holtermann admitted that the bees would store it below, and it would have a tendency to cause the bees to swarm. When the bees get the fever up they do not work the same, and are not bringing in so much honey from the field.

Mr. McEvoy: About how much more extracted honey will you get than comb, by leaving the comb in the supers till it is pretty well sealed before being extracted?

Mr. Post: It would average about 65 of comb to 100 of extract.

Mr. Frith: You would simply get it in proportion to the amount of sealed honey.

Mr. Pickett: In our section we get from 60 to 65 per cent. of comb honey to extracted honey.

Mr. Frith: What percentage would you suppose to be sealed?

Mr. Pickett: About three-fourths.

Mr. Hall: Eighty-five per cent.

Mr. Newton: I was judging about 75 per cent. when you leave the combs to be thoroughly capped.

Mr. Hall: If they have to draw the comb in both cases there would be no difference comparatively. You have given them so much of a start in one case, it is like two men going for a race.

Mr. Evans: Is not the reason we get a greater amount of extracted honey due to the fact that in one case we have combs left over from the year before ready for the bees to fill, and in the other case they have to draw out the foundation?

Mr. Darling: I am not a comb honey producer, but I take a few sections sometimes for my own accommodation, or that of other parties, and I have found what has

led me to believe that the bees do not build down or draw out comb as fast in sections as they would in one solid sheet. That has been my impression in the past, and I adhere to it still this evening. You know I use the Jones frame and I sometimes drop a sheet of perforated metal and take out my honey at what Doolittle calls the side storey; it is a good deal more difficult to get the bees to draw them out and fill them than it is if you drop in a sheet of foundation in the frame. If I drop one in the front in order to keep pollen from going in the sections, and if I drop another behind, the probability is that the sheet which is behind will be drawn out and filled before the sections are that are between the two. Why is it, unless they hate to work in those little holes?

Mr. CHRYSLER: I can get a little more honey by having shallow frames instead of sections, say four inches and four and a half, than I can if that space was taken up with four sections filled with comb foundation. There is more finishing up to do in the sections than there would be in a frame four times as large, and I always contend, from what experience I have had, that if we could have our comb honey in that sized section it would be more profitable.

Mr. SPARLING: This year my bees commenced to work with a rush; it lasted only just three or four days, and those that had extracting supers on had quite a lot of honey in them when the bees that had foundation to draw out in sections had only just commenced.

Mr. HALL: If you give them foundation in both cases, and let them cap it, you will find precious little difference in the result; that is, if you weigh the surplus honey in the brood nests as well as what you get at the top. If you only reckon the top you don't know what you are doing. In one case you may have thirty pounds below and in another case you may only have three pounds below.

Mr. MCKNIGHT: What is the most convenient article that can be employed for taking down a cluster and hiving the swarm?

Mr. EVANS: Some years ago I was in Owen Sound in the summer season, about the time of bee swarming, and I called on Mr. McKnight and he very pleasantly showed me a system of swarming which was the best I have ever seen, and I have followed it ever since. I think probably he had better describe it himself. I thought it was worth journeying all the way to Owen Sound to know. I was at Mr. McKnight's house and was very well treated, and I learned how to take down the bees on a stick, which I think is one of the best things I ever learned.

Mr. MCKNIGHT: It was just mainly to give my experience on that point to my brother bee keepers that I raised the question. What I have used for fifteen years is considered to be the best thing of the kind that is used anywhere. Its construction was not original with me; I saw it mentioned or described in *Gleanings* fourteen or fifteen years ago, and I was a comparatively young bee-keeper at that time, testing nearly everything I saw that came along. This is a very simple and cheap contrivance. Those of you who were brought up in the old country will best imagine what it is like when I tell you it is on the principle of a chimney-sweep's brush, only a chimney-sweep's brush is wire, and this is made of wood. Take, for instance, a piece of stick two inches square and say two or three feet long, chamber the four edges of it and make it octagonal in shape (eight-sided) cut off a few pieces of lath, rip your lath up the centre, cut them into pieces about two feet long and nail them around on these eight bevels one after the other till you get it filled down well, six or eight inches would be quite sufficient. At the other end cut a tin ferrule, put it on the stock with perhaps two inches or two and a half inches to receive the stick that you put into it. Have in your yard half a dozen or more different lengths of stick that will slip easily into this socket. When your swarm is clustering that is the best time to do it, but it does not matter; you can do it almost as well after it is clustered. You can see at once what length of stick is required to reach the cluster. Take the stick that you have in hand, put it into the socket, and as they are clustering put this in amongst them and they will cluster on it every time. I have taken swarms of bees off the top of a big old elm tree; simply by tying one onto the other you can reach away up to where the cluster is. If they are clustered, as very frequently they

are, before you have noticed them, take your stick again and give a sudden jerk near the cluster of bees till you dislodge them from their resting place. I will guarantee to catch nin ty-nine swarms out of one hundred with that simple contrivance. Having them clustered, then you can set your stick on the ground and take it away. When they are all settled upon your chimney-sweeping brush, lower your stick, drop the stick that was in the socket, carry home the swarm of bees to the front of your hive, and give it a sudden jerk and there you are. I may tell you that when one of the prominent members of the British Bee Keepers' Association was over here during the Chicago Exposition he stopped at my place for a while and I was showing him this contrivance. It was in the morning, and I had little hope that I would be able to give him a practical demonstration of its usefulness. In going through the orchard, which was composed mostly of old trees—my bees were in the orchard—there happened to be what an Englishman calls a "cast," and evidently it had been there all night and it was worth having. I took the stick and went through the simple operation with that little cluster and in less than ten minutes the cast was upon my chimney-sweeper's brush He was so much interested in it that he wrote me, and asked me to give him a full description. This device will not cost more than ten cents, and a boy of twelve years old could make one. The only thing that costs anything is a tin ferrule, worth about five cents. I would recommend every one of you here to try it, and I believe if you try it one season you will never dispense with its use.

Mr. McEvoy: The question asked can perhaps be answered in another way—I find a pair of scissors a good way to get them down.

Mr. McKnight: I never clip my queens.

Mr. Evans: I suppose this does not interest expert bee keepers who clip their queens, but there are some who do not. I have had some clipped queens, and I do not like them at all. In returning they are liable to pile onto the adjoining hives. Coming back to the fact that we allow the bees to swarm and what is the best way to get them down, I have found this device of Mr. McKnight's an excellent thing. I did not bother with the tin. I made a couple of them of different lengths, and then I fastened a hook on the end at the top, and I have another pole with a hook on it. I take the precaution to hang the pole with the hook on it on the limb, and then I hold the device under the limb and I give the limb a jar, and then I hang it on the limb and the rest go to it.

Mr. Frith: It puts me in mind of a device I saw when I first commenced to keep bees. It was made on the same principle, only the man had, I think holes bored in the central piece and corn cobs stuck in it.

Mr. Hall: I knew a man who married a school teacher, and the bees were given to the girl baby. This man used to keep some thirty to seventy stocks of bees and the product of the bees belonged to the baby I said to him how do you manage when the bees swarm? He said, "I don't have to come up from the field. As soon as ever my wife sees that the bees are swarming, and they begin to cluster, she does not go near them. They begin to cluster and she takes this thing on a pole." It looked as though there were a lot of corn cobs stuck in it, and on top of it was a hook, and she would raise up the stick with the hook on it and would shake the limb, and then she would put it on the ground and go away and wash her dishes. Someone said the best plan is to use the scissors. I use a penknife.

Mr. Holmes: I have used a device something similar to the one described by Mr. McKnight.

Mr. Hoshal: I have just been wondering in my mind whether the use of the scissors works out as practically as it does in theory.

Mr. McEvoy: Every time.

Mr. Hoshal; I suppose the bees go back every time just where they came from?

Mr. McEvoy: Nearly always. I just catch the queens and put them in the hives, and feed them for hours, and I let them all return, every one of them.

Mr. Darling: We do not all have the opportunity of living alone. It was my misfortune to have a neighbor who was exceedingly troublesome. The longer we lived oppo-

site each other the more troublesome he got; whether it was his fault or mine I do not know. My bees used to go across; they do not mind fences, and there did not happen to be any fence between his place and mine. He had made some pretty nasty threats about what he would do with me and my bees, and I wasn't what Mr. Hall calls a clipper then. However, I made up my mind rather than have any difficulty with a neighbor I would try what the scissors would do and I clipped my queens. The next year I put my bees out again right around my house, and when swarming time came one or two of the neighbors thought there would be some fun. When the swarm would come out I captured the queen and let the bees go, and they would circle around and around, and after I had my queen caged and everything ready I sat down and waited quietly, and they came right back to where I was sitting and commenced going in the hive. Finally one of the neighbors said, "What ails your bees?" I said, "I don't know that there is anything wrong with them." He said, "You do not have to go after them." I said, "My bees have good manners, and they go away and come home when they get ready." He said, "They don't seem to go over to the neighbor's." I said, "My neighbor does not want them. They go away, and when they get tired they come back." I told them at last what had been done. It saved me a good deal of trouble. I found further, before that season was over, if I had not had my queens clipped I would have lost a good many swarms. They tried to get away, and they would have left only for the fact that they could not take the queen with them. I have had as many as five swarms piled in a heap on the fence. But there is a difficulty here, and not one has touched upon it, although I will guarantee Mr. Hall has met with it. Sometimes we have maybe three swarms in the air at one time, and there chances to be one or two young queens that come out for a fly. They get in that swarm, and you might wait a week or a month, but you would not have to wait very long before you would see them go to the bush. I believe in clipping the queens because it saves a good deal of trouble.

Mr. ALPAUGH: I do not think you will find an old swarm go away with a young queen—that is, a swarm that has had an old queen.

Mr. DARLING: I have had it done, and have had them leave the old queen there, and have had to kill her.

Mr. ALPAUGH: They found the swarm with a young queen and an old queen, too; they would not go to the woods with a strange young queen.

Mr. HALL: I can corroborate what Mr. Alpaugh says from personal experience. You cannot have a swarm of bees fly away with a young queen belonging to another hive. That does not take place, and cannot take place, because it is not natural. I have had the experience of the old queen and the young queen coming out together. Mr. Darling received a queen from me; that was a queen of that kind, and it came out on the Sabbath. It was just before dinner, and it was lying on one of these little new thorn hedges we are putting out. We went to dinner, and when I was coming from dinner they were going to the woods. I had my old queen in the cage, and I went to the hive and I saw there were other young queens there. This swarm of bees had got its young queen, and I had got the mother at home. But they went off to the woods. Another time there were three swarms of bees hanging on the apple tree, and I had bundled two of them into a hive and the other one went back where its queen was; we hunted around and found the queen in the grass. I had not got things settled, and they came out again, and I said, "They are going to the woods;" but not so. They went to the hives. They went to where they came from. They had simply gone in with a small swarm with a young queen, and the small swarm with the young queen stayed where they were put.

Mr. HOLMES: What is likely to occur if the attendant or man in charge of the yard happens to be off duty when a swarm issues with a clipped queen?

Mr. HALL: The bees come back again mostly; the mother goes back with them. That is the only way you can run out apiaries. I go out to my apiaries once a week. If they swarm they will have to go back again, and then they will swarm again the next day. Very likely they will get dissatisfied with the mother and they will kill her. If the queen is there and the cells are capped we know what to do. They will go back again

and the mother will go back again; she does not want to go to the woods. We have got erroneous notions from these John Bulls and these Dutchmen as well, as to the queen leading off a swarm. She is not a queen, she is a mother. She is never out until after the bees are out; and she does not want to come out; therefore an old queen never leads off a swarm.

Mr. DARLING: Did you ever see the bees crowd them out behind?

Mr. HALL: I cannot say that I have.

Mr. HOSHAL: I have been wondering if there is any difference in bees as to their hiving qualities, the same as there is in their honey-gathering qualities?

Mr. DARLING: Some of them come out, and if they come out a second time you cannot get them to go back again; they will go to the woods.

Mr. HOSHAL: What made me ask the question was principally this: I have not been in the habit of clipping, but in these conventions I find that there are bee keepers who do clip, and it makes me somewhat sceptical in my position as to whether I have got the right end of the thread or not.

Mr. ALPAUGH: If you place your hives along in rows, very uniform, just so far apart, you will have any amount of trouble in your arms returning; if they cannot get into a hive they will go into the next one, and follow right along. But if you turn your hives in clumps of four you will have no trouble, for they will find their own hive every time.

Mr. MCEVOY: In a swarm returning to the wrong hive what would you do?

Mr. ALPAUGH: I just stuff up the hives with anything.

Mr. MCEVOY: I have tried throwing a cloth over them, but of late years I find the best thing is to get a smoker, and I can cover the hive.

THE SAN JOSÉ SCALE.

BY W. M. ORR, SUPERINTENDENT OF SPRAYING, FRUITLAND, ONT.

When this work of spraying was committed to my hands by the Hon. Mr. Dryden, Minister of Agriculture, he wrote me certain instructions, which I will give you, saying, "Word has come to me that some of the spraying has been done while the trees were in bloom. I think this must be wrong information, but I hope you will guard against making this error." That was the first letter I received from him. I may say, I at once telegraphed to each of the men who were doing work in different parts of the Province, instructing them not to spray under any consideration when the trees were in full bloom, and to instruct others not to do it. Every intelligent fruit grower knows that it is not only useless but injurious to spray when the trees are in full bloom. Thirty thousand copies of a bulletin were issued, and in this bulletin we say, "In no case spray while the trees are in bloom, but immediately after; it is contrary to law." We are going to add in our new bulletin that offenders are liable to a fine of from $1 to $5 for each offence. We cannot get things perfect just at the start. There is no conflict, or at least there should be none, between fruit growers and bee keepers, as our interests certainly are one.

There is a matter which I think probably you have not considered, and which is more serious than you may think, and that is the San Jose scale invasion. If this enemy of the fruit grower and of our forests is left unchecked, there will, in the course of a short time, be no trees to bloom. The scale affects every tree except the pine and the cedar. It is also said one variety of cherry is exempt from its ravages; but I think perhaps that is not altogether certain. I can give you a short history of this scale, if you think it interesting, and I have specimens of the wood and fruit infested with me.

It originated in the San José Valley in California, and was first known as a pest there about twenty-seven years ago, but inside of a few years it had spread in all directions from the place in which it was first detected. It was unknown east of the Rocky

Mountains until about seven years ago, when it was brought to nurseries in New Jersey in nursery stock, largely on the Japan plums which were being propagated and distributed from there. It has spread rapidly throughout the United States, and we hear the most alarming reports with regard to it. One inspector reports that within a radius of six miles every orchard is infested, and from the earlier infestations the orchards are almost entirely ruined, in some cases not five per cent. being left. It reached our own country, so far as we can learn, about four years ago. The first infestation that we known of was about five miles from Chatham, in the county of Kent. A gentleman there had received nursery stock from the New Jersey nurseries, and set it out. The trees apparently did well for a time, and then commenced to fail. The owner of the orchard noticed an incrustation coming over the trees, and he sent specimens to Prof. Fletcher, of the Experimental Farm, Ottawa. Specimens were also sent to Professor Howard at Washington, and he was informed that it was an infestation of the San José Scale, and advised to take every possible means to exterminate it. The owner at once commenced treating the trees, and treated them regularly all summer, but the results in the fall were not satisfactory, and he burned the trees. He wrote this fall saying : "I have entirely exterminated the scale from my orchard ; I have watched carefully all summer and cannot detect any traces of it." I was there about six weeks ago, after this writing, and asked him to go with me to inspect the trees. It was a very stormy day and very bad weather indeed. We went toinspect the trees and inside of a very few minutes we found several trees infested, and he was very much surprised. Out of this same lot of trees which he got there were some given to another man and the infestation was found there, and the trees taken out and burned, and whether any infestation remains there or not I do not know. The next was a fruit grower, two miles from old Niagara on the Lake. He noticed that his trees were not doing well, presenting a greyish ashy appearance. He sent some of the specimens to Washington to Professor Howard, and was at once informed that it was the dreaded pest of the San José Scale. He commenced treating his trees at once, and there were only about a dozen infested. It was made known to the Ministers at Ottawa and Toronto, and the Professors from Toronto were sent on there, and the Professors from the Agricultural College of Guelph and myself, and a meeting of the fruit growers was called, and we made an inspection of the trees, and for the first time I saw and learned what the pest was. At that time I think perhaps fifteen or twenty trees would be the total number that we found infested. I have visted the orchard four times since. I may say also that this fruit grower was very anxious to save his trees, as any man would be. He had 140 pear trees and 1,600 peach trees. The worst he dug out and burned ; and the rest he has treated every week all summer with whale oil soap which is considered the best preparation. I visited this orchard last week, and he told me he had become completely discouraged; that he had dug up the 140 pear trees and burned them. We found eleven trees in his peach orchard slightly infested last July. After talking the matter over with him for a length of time, we decided it would be advisable to take out eleven of the trees, in order that the infestation might be entirely checked. The Minister ordered that he should be paid $250 for the trees taken out, both pear and peach trees. An agreement was made, and he consented to destroy the trees, but finally he relented. There was perhaps five or six baskets of peaches on the trees, and he thought he could save the crop. He went to the Minister and asked to be relieved from the bargain ; the Minister said he did not think he could relieve him ; that he thought the only cure was to stamp it out. He said he would not destroy them unless he was forced to do it. He tells me now that the infestation in his peach orchard covers eight times the area it did in July last.

It is a very difficult thing to detect. In fact, I made a very careful inspection of the outside and inside and ends of his orchard in July last, and I could find no signs of the scale there at all, and now it is quite easy to find ; and he has just about given up in despair. This is just about in keeping with the record of treating the scale on the other side ; it really appears that where it gains a foothold it is almost impossible to stamp it out. Some of the Professors say that if left unchecked it will have a wide habitation all over the face of the earth. A single scale, with its progeny, wintering over during the season will amount, Professor Howard says, to three billion. I have found trees that were completely encrusted with the scale, and then on top of the scale it was just alive with young. They are not visible to the naked eye ; you have to find them with a glass.

Mr. J. K. DARLING: A man with strong eye glasses can detect it. I saw it on the fruit in Toronto.

Mr. ORR: There is a clearness and smoothness about the skin of fruit that you cannot get on bark. I have a specimen here of the wood infested, which you can see if you wish.

Mr. F. A. GEMMELL: Is there any danger of it being carried on the clothing or hands to an orchard from here?

Mr. ORR: Yes, in California they will not allow a man who is driving through an infested orchard to go to another. There is of course not the slightest danger with regard to the specimen which I produce to you now. The insect only travels from two inches to a foot in a lifetime; they commence to breed about the first of June and continue as long as the warm weather lasts. I produce also for your inspection a pear; the discoloration which you see on it is caused, both on the wood and on the pear, by the scale.

Mr. J. B. HALL: From your experience, you think the only safe course or remedy is extermination?

Mr. ORR: I do, and the bulletins I am receiving from the other side speak in the strongest terms in regard to extermination at any cost.

Mr. F. A. GEMMELL: In what way does it affect the fruit? Does it kill the bearing qualities of the trees?

Mr. ORR: No, not that; it simply saps the whole life from the tree and it withers up and dies, and the fruit, as well, does not attain its growth. The male insect cannot spread it at all. A bird lights on an infested tree, and the lice get on the feet of the bird and it carries the disease in that way to another tree. The lady bird feeds on them, and as she flies from tree to tree she carries them with her. Wherever the trees interlace the insects pass themselves. It will attack every deciduous plant or wood; it cannot live on dead wood; as soon as the plant or tree that it is on dies it dies with it.

Mr. J. K. DARLING: There would be no danger if the wood is dead?

Mr. ORR: Not if dry and dead.

Mr. ALPAUGH: Is there no danger of them leaving the dead wood?

Mr. ORR: They have no power to leave it; they anchor themselves inside of twenty-four hours and never move afterwards. There is no egg laid; they produce living young. They are the only scale insect out of many that does. They produce living young, and produce them constantly. I would like to give my reasons for bringing this matter of the scale before you; it might appear to be a little foreign to your work. I feel that it is a matter that demands our most serious consideration; there is a very great deal at stake, indeed. There is one man already who has three farms and over 7,000 trees out and they are all just coming into bearing condition. I know of one orchard which contains about 1,600 pear trees nine years old, and I do not think one tree can be saved; my opinion is that the whole orchard will have to be taken out, and he has three other orchards infested I have found it in orchards between Hamilton and Grimsby, and between Hamilton and Oakville. It may remain there for two years and you may not detect it. If it is carried by a bird into the top of a tree it will work downward, and you may not notice it.

We located infested stock in 1895 in different places in Ontario, and I have been visiting those places just as rapidly as possible. There are many instances in which we visit the place, and the trees are dead and gone. In one case I drove twenty-two miles to see two trees which a man had, out from Bothwell. It was over a terrible road, and when I got there the trees were in perfect condition. Suspected trees have been sent all the way from Ottawa through to Windsor, and we had the whole country to go over to find them and inspect them. I am satisfied that there will have to be fifteen or twenty more men sent out so that this matter can be thoroughly investigated and the scale exterminated at any cost. I presume that you are all aware of what they have to do with the Gipsy Moth in Massachusetts They were brought there for the purpose of investigation by naturalists; a few of them escaped, and got out over the country and covered a section

of two hundred miles square and they have been fighting them now for a number of years. They have expended $700,000, they have had eighty men out all this summer, and they expect to spend a million dollars more before they get it under control; whole forests are going to be cut down and burned. I believe we have just as great a pest in this San José scale as they have in the Gipsy Moth. I do not think the San José scale has obtained any very great foothold in this country, and I say let us stamp it out at any cost if we can.

Mr. J. B. HALL: Is there any penalty for keeping it?

Mr. ORR: There is no legislation in regard to it at all; there is a bill now being framed in the house, and fruitgrowers and all interested bodies ought to make their wishes known in the matter.

Mr. J. B. HALL: I think we, as an Association, should make it our business to see that there is legislation on this point; if the trees die we have no honey, and if we have no honey we make no money. I think the bee keepers should assist the fruitgrowers in getting legislation for the purpose of getting this thing stamped out.

Mr. ALPAUGH: Cannot this be cured the same as they do it in California—by putting a tent over the tree and sulphuring it?

Mr. ORR: They treat it with hydrocyanic gas, but it is very expensive.

Mr. ALPAUGH: It costs twenty-five cents a tree.

Mr. ORR: If a man has 2,000 trees it amounts to a good deal, and the treating of it does not seem to be thoroughly effective. One man who has had bitter experience says he can kill the ninety-nine on the trunk and main limbs, but the one on the tree gets away. He wrote an article for one of the American papers some time before advising any man that had a tree infested not to cut it down because he thought the tree could be saved, but after his experience in dealing with it, with the expense and trouble, and, as much as anything else, the apathy of his neighbors, they taking no interest in it whatever, he has given up all hope of being able to control it; some men might probably keep it under control and others would neglect it. The Local House is taking action, and I presume the Dominion House will when it meets.

Mr. EVANS: In what way can this Association help you in getting legislation?

Mr. ORR: One matter that is demanding consideration particularly is compensation. We do not suspect that it is in any forest except one—that is a beautiful grove near Niagara—but in the United States they have cut down hundreds of forests.

Mr. ALPAUGH: I have travelled through California, but I have not heard of their shade trees and forests being affected; they do no not treat them at all; it seems to be only the fruit trees.

It was moved by Mr. R. F. HOLTERMANN, seconded by Mr. EMIGH, and resolved, "That this Association ask for the strict inspection of nursery stock and fruit coming into this country, in order to assist in the eradication and extermination of the San José scale, and that reasonable compensation be given to those who are at a loss by the destruction of their stock, and that Messrs. J. D. Evans and J. B. Hall be a committee appointed to present the resolution."

Mr. W. McEVOY moved, seconded by Mr. R. F. HOLTERMANN, that on behalf of the bee keepers of Ontario a vote of thanks be tendered to Mr. Orr for the very valuable work which he has done throughout the Province in instructing the people as to when and how to spray, and that Mr. Orr be made an honorary member of this Association. Carried.

Mr. R. F. HOLTERMANN moved, seconded by Mr. F. A. GEMMELL, that a vote of thanks be tendered to the Hon. John Dryden, Minister of Agriculture, on behalf of this Association, for the interest he has taken in bringing the Act with regard to the spraying of fruit trees at the proper time before the fruit growers.

The PRESIDENT put the motion, which, on a vote having been taken, was declared carried.

THE PUBLIC SCHOOLS AND HONEY.

Mr. FRITH moved, seconded by Mr. GEMMELL, "That whereas the Educational Department of Ontario have in contemplation the re-arrangement of the system of education, making it more practical in the public schools of Ontario, therefore be it resolved that we as bee-keepers co-operate with the other departments of industry and others in asking that the subject of honey be taken into consideration." Motion lost.

BUILDING UP BEES IN THE SPRING.

Mr. C. W. POST read his paper entitled "Building up Bees in Spring," which may be found in the annual report for 1896.

Mr. GEMMELL: Do you use any of those hives that are painted of a dark colour when you take them out to the country?

Mr. POST: No. The dark side is on the north.

Mr. GEMMELL: You do not give them any extra shade?

Mr POST: That is all.

Mr. ALPAUGH: Those who have not got out-apiaries to put their bees in should use a double entrance and reverse their hives according to the season.

Mr. POST: You can swing them around.

Mr. HOLTERMANN: You do not need any double entrance if you have your entrance on the bottom board. All you have to do is to turn your hive around.

Mr. GEMMELL: You spoke of stimulative feeding when a great number of bees are hatching. Would that be previous to the fruit bloom or after?

Mr. POST: It generally occurs just after fruit bloom. As a rule I do not feed before fruit bloom, but sometimes it is necessary for me to feed right in fruit bloom.

Mr. SMITH: Do you find much on the bottom board? Does it require much cleaning out? Because we find if the bees are wintered in a high temperature from 48° to 52°, there will be practically nothing on the bottom boards.

Mr. POST: My bottom boards are clean and dry.

Mr. SMITH: You speak of cleaning them off.

Mr. POST: I spoke of a new bottom board under each hive; I begin with a clean one and go right through. As a rule they are clean and never clog up.

Mr. HOSHAL: Do you spread brood?

Mr. POST: I do when the right time comes—after the honey flow. I use nine frames.

Mr. SMITH: Do you think it is necessary to have a division board?

Mr. POST: Sometimes we have a weak colony.

Mr. SMITH: You spoke of a device, and said that a bee space under the quilt was not advisable; that is, a bee space between the quilt and frames.

Mr. POST: No; I pack tight on top of the frames.

Mr. SMITH: Where there is a bee space no other device is necessary.

Mr. POST: They cannot get across if you pack down solid on top of the frames.

Mr. HALL: Mr. Post has certainly got on the right track in keeping bees, but he does perhaps a little more labor than I would do. In cleaning off his bottom boards there is only about ten per cent. requiring cleaning, and that ten per cent. does not pay to look after. He says the bottom boards are practically clean. That is the case in all stock

wintered right; and I do not think it advisable to tell anyone to raise their bees from the bottom board to see if they want a clean one. The entrance will generally tell us that. There are some that from some cause die and do not come out of the hive, and I find that those stocks of bees are not worth saving; they are not long-lived, and if we save them we are going to be troubled with them another spring. It is better and cheaper to let them die, and leave our stand and hive free for something more desirable and profitable. Mr. Smith asked the question as to the bees getting over the comb. If it was left for me they should not have the chance of getting over the top, but to do that I should have to use a quilt, and as the quilt or cloth dirties the top bar over the frame I would not have a clean bar, and I want them clean. I do not want to scrape them, and with a quilt left over the top, while the bees are at work either preparing for the winter or while they are in the harvest, they will put in brace combs, etc., which makes a mess. It clogs a quarter of an inch space over the top bar and the cover or honey board of the hive. I do not want it there, but I grin and bear it simply because I do not wish to use the quilt.

Mr. POST: I do not use the quilt. There is a bee space.

Mr. SMITH: I understood that it came right down on top.

Mr. HALL: If that is the case, you practically winter as I do. I do not think it would do any special harm unless your stock is very weak, and it is outside. In the case of very weak stocks it does not pay us to look after them, and it is better that they should die. When you own about four or five hundred stocks, like Mr. Post, he does not miss them anyway; perhaps he will shake off thirty or forty to get rid of the thing.

Mr. MCEVOY: Mr. Hall was speaking of them dying in winter. Why do they die?

Mr. HALL: Because they are not a long-lived bee.

Mr. MCEVOY: It is just according to whether they breed or not. If the bees rest they will not die, but it is a lot of work.

Mr. HALL: It is well to get rid of those bees that will persist in getting into that condition that they have to die.

Mr. MCEVOY: If we come into a warm winter, with an open space in the centre and a young queen, that queen will set to work to lay early and breeding will take place, and then the death rate will increase.

Mr. EVANS: I believe you use a cover with a bee space between it and the top of the frames. In wintering outside do you leave that cover on?

Mr. HALL: The tighter it is the better I like it. I am very cautious as to how I handle that. That is the reason I do not have assistants very often to loosen this top honey board. I have some Hedden hives, and you can make them as large or as small as you choose. Last winter we happened to have one in apiary six storeys high, Hedden cases; the frames were so stuck together I could not divide them very well. They had to be carried into winter quarters, and I had to get a man to carry them in and, standing pretty close by it, I saw bees with a young queen in one story with an abundance of stores. They were the only ones that went into winter quarters out of their normal condition. When January came this six storey lot commenced to spot the front of their hives, and I said they had dysentery and were going to die. The other one was standing just on top of it. It kept nice and clean through the winter, and was put out in good condition in the spring, and I got my neighbor to assist me with those. The one which was six storeys high, at the time we put it out, had one quarter of an inch of this spotting on the front of the hive, three times the size of a hand; it went to about seven inches above the entrance and from side to side, and near the entrance it was fully a quarter of an inch thick. We set them out and it was a very favorable afternoon; they flew well, and a lot of them did not come back again, but I let them have their own way. The small hive gave me one super of 28 sections finished comb honey. What do you think the other did, the one that was spotted? Just multiply the other one by five—the one that gave me one super with 28 sections, that came out of winter quarter in pretty good shape, with a young queen, and did not swarm.

Mr. McEvoy: That is a great exception to the rule.

Mr. Hall: These are isolated cases, but with me, if I had a hive that carried twenty frames and had one of these little bunch of bees, if they had enough honey in the hive I would not touch them—they should do as they choose. If they come up and give us some honey I say: "You are good bees, you are profitable to keep." If they die, I say, "Good riddance, I have got the hive for something else."

UNFINISHED BUSINESS.

Mr. Hall moved, seconded by Mr. Post, that the objectionable words "Foul Brood Inspector" be eliminated from the statute and that the words "Inspector of Apiaries" be inserted in their place. Carried.

Mr. Holtermann moved, seconded by Mr. Gemmell, that by-law No. 15 be amended by striking out the words "1st day of December," and substituting therefor the words "15th day of November." Lost.

Mr. Couse moved, seconded by Mr. Gemmell, that this Association endorse the action of the Government in the appointing of a commissioner in London, England, to place honey on the list of Canadian products; and that we would recommend Mr. C. W. Post as a fit and proper person to act as inspector for the purpose of guaranteeing any honey which the members of the Ontario Bee-keepers' Association may export to England. Carried.

Mr. Gemmell: I would like to know if there is any data as to when the first Italian blood was introduced into Canada.

Mr. Frith: I have no proof, but I think just south of where Mr. Brown lives, between there and the St. Lawrence, there was an Italian queen introduced from Langstroth as near as I can remember between 1855 and 1860.

Mr. Brown: James Moffat, of Los Angelos, California, was, as far as I am aware, the earliest importer of Italian bees.

Mr. Frith moved, seconded by Mr. Brown, that the name of Mr. John Newton be placed upon the list of those recommended by this Association for the position of Dominion Apiarist. Carried.

Mr. Hall moved, seconded by Mr. McKnight, that votes of thanks be passed to the press for services to us as an Association while we have been in session in the city of Hamilton, and to the county council and to the mayor and corporation of the city of Hamilton for the advantages and conveniences which they have afforded to the Association. Carried.

On motion of Mr. Post, seconded by Mr. Gemmell, the convention adjourned to meet again at the City of Guelph in 1898.

DIRECTORS' MEETING.

At a meeting of the Directors at the close of the annual meeting Mr. Couse was re-appointed Secretary and Mr. Martin Emigh re-appointed Treasurer.

The president, vice-president and second vice-president were appointed an executive committee.

The usual $200 was appropriated for the affiliated societies, no society to receive more than $20.

The following grants were made to the Toronto Industrial Exhibition Association, Western Fair Association, London, and the Canada Central Fair, Ottawa, respectively, $25, $10 and $10.

The executive committee were also appointed the programme committee.

It was decided to give each member *The Canadian Bee Journal* for the current year.

The executive committee was advised to settle ordinary accounts when presented.

Mr. J. K. DARLING and Mr. R. F. HOLTERMANN were appointed a committee to send any samples of honey to the Inland Revenue Department, Ottawa, that they may receive, for analyzing.

W. COUSE, Secretary.

BY-LAWS.

1. This Association shall be known as the Ontario Bee-keepers' Association, and shall be composed of those interested in bee-keeping who become enrolled as members by paying the annual membership fee of one dollar.

2. A general meeting of the members of this Association shall be held once a year, and shall be known as the Annual Meeting, the year to begin with the election of officers at such Annual Meeting and terminate on the election of their successors at the next Annual Meeting. At this Annual Meeting, or at any other general meeting of the members of this Association, ten members in good standing shall constitute a quorum.

3. The time and place of holding the next Annual Meeting shall be fixed by the members present at the Annual Meeting.

4. The Board of Management shall consist of a President, two Vice-Presidents and nine Directors, elected one from each of the following twelve divisions :

Division No. 1.—Stormont, Dundas, Glengarry, Prescott and Cornwall.

Division No. 2.—Lanark, Renfrew, Carleton, Russell and Ottawa.

Division No. 3.—Frontenac, Kingston, Leeds, Grenville and Brockville.

Division No. 4.—Hastings, Addington, Lennox and Prince Edward.

Division No. 5.—Durham, Northumberland, Peterborough, Victoria and Haliburton.

Division No. 6.—York, Ontario, Peel, Cardwell and Toronto.

Division No. 7.—Wellington, Waterloo, Wentworth, Dufferin, Halton and Hamilton.

Division No. 8.—Lincoln, Niagara, Welland, Haldimand and Monck.

Division No. 9.—Elgin, Brant, Oxford and Norfolk.

Division No. 10.—Huron, Bruce, Grey and Perth.

Division No. 11.—Essex, Kent, Lambton, Middlesex and London.

Division No. 12.—Algoma, Simcoe, Muskoka, Parry Sound, Nipissing and Manitoulin.

Also one Director from the Ontario Agricultural College and Experimental Farm.

The Board of Management so elected shall appoint from among themselves, or otherwise, a Secretary and a Treasurer, and shall also appoint at least three of their number as an Executive Committee.

5. Five members of the Board shall constitute a quorum.

6. Vacancies on the Board by death or resignation may be filled by the President, subject to the approval of the Executive Committee.

7. The officers of this Association shall be elected by ballot, with the exception of the Auditor, who may be elected by an open vote of the Association.

8. It shall be the duty of the President to preside at all meetings of this Association ; to call for reports ; to put motions when seconded ; to decide upon questions of order and to declare the result of ballots and elections. The President, in connection with the Secretary, shall have power to call special meetings when necessary. The President shall be *ex officio* chairman of the Board of Directors, and shall call it together when necessary.

9. In the event of the death or absence of the President, the Vice-President shall discharge his duties.

10. It shall be the duty of the Secretary to keep and preserve the books of the Association ; to call the roll and read the minutes at every meeting of the Association ; to conduct all correspondence of the Association ; to receive and transfer all moneys received for fees and otherwise to the Treasurer, having taken a receipt for the same ; to make out a statistical report for the Association and for the Government ; to furnish the officers of the County and District Associations with forms for organization and annual reports, and to give notice of Association and Board meetings through the press or otherwise.

11. It shall be the duty of the Treasurer to furnish such securities for the moneys of the Association as the Board may determine; to receive from the Secretary all moneys belonging to the Association and to give receipts for the same; to pay them out on order endorsed by the President and Secretary, and to render a written report of all receipts and disbursements at each Annual Meeting.

12. Any County or District Bee-Keepers' Association in the Province of Ontario may become affiliated to this Association on payment of five dollars, which shall be paid to the Secretary on or before the first day of June in each year; but every local Association so affiliated must have on its membership roll at least five members who are also members of the Ontario Bee-Keepers' Association at the time of its affiliation, and must continue to have a like number of its members on the roll of this Association while it remains in affiliation.

13. Every affiliated Association shall receive an annual grant out of the funds of this Association. The amount of such grant shall be fixed by the Board from year to year.

14. All grants to affiliated Associations shall be expended in prizes for honey shows, or for shows of apiarian appliances, or for lectures on subjects pertaining to bee culture, or for advertising district or county meetings, or for any or all of these, and for no other purpose.

15. Every affiliated Association shall report to the Secretary of this Association (on a form to be supplied by the Secretary) before the first day of December in each year, which report shall be signed by the President and Secretary of the affiliated Association.

16. County or District Associations seeking affiliation should forward to the Secretary an application according to the following form:—"We, whose names are written in the accompanying form, having organized ourselves into a County (or District) Association to be known as County (or District) Association No.—, desire to become affiliated to the Ontario Bee-Keepers' Association, and we agree to conform to the Constitution and By-Laws of said Association."

Form of application as follows:

Names of those already Members of O. B. K. A.	P. O. Address	Fees.	Names of those not already Members of O. B. K. A.	P. O. Address	Fees.	Remarks.

17. Every affiliated Association that neglects or refuses to pay the annual affiliation fee, or neglects or refuses to forward to the Secretary the annual report on or before the date fixed, may be deprived of their affiliation privileges by the Board.

18. Should an affiliated Association become defunct after the payment to it of the grant from this Association, any unexpended balance of said grant shall be forfeited and paid over to the Treasurer of this Association.

19. Each affiliated Association shall be entitled to the privilege of two representatives at the meetings of this Association in addition to those who are already members of this Association, and such representatives shall be entitled to all the rights and privileges of members of this Association.

20. Every delegate from an affiliated Association shall furnish to this Association a certificate, signed by the President and Secretary of the body which he represents, showing that he has been duly appointed a delegate of such Society.

21. Each affiliated Association shall be entitled to the services of an Association lecturer (when such exists) once in each year, half the expenses connected with such lecture to be borne by the District or County Association and half by this Association.

22. The order of business by which the meetings of this Association shall be governed shall be in the discretion of the President, but subject to appeal to the meeting when objection is taken, when a majority vote of the members present shall decide on the objection, and in such cases the vote of the majority shall be final.

23. These By-Laws may be amended by a majority vote of the members present at any Annual Meeting, or at a special meeting of the members called for the purpose of considering the same, and of which at least two weeks' notice shall be given by public advertisement.