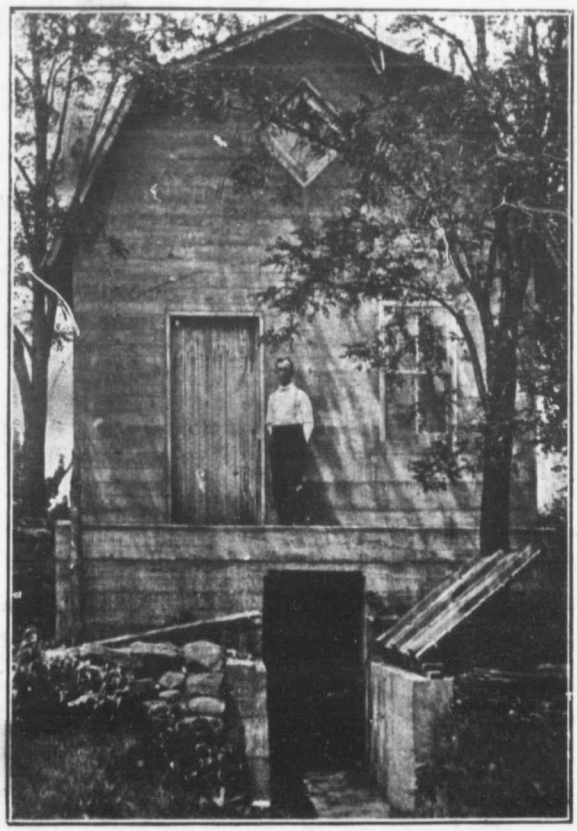
THE CANADIAN BEE JOURNAL

Vol. 18, No. 9. SEPT. 1910 $1.00 Per Annum



View No. 2—Entrance Into Cellar.

Canadian B

Devoted to the Inter

JAS. J. HURL

Published m
The HURLEY P
Brantfor

TERI

$1 per annum; two
able in advance. Th
Canada, United States
other countries, 12 ce
postage.

Discontinuances—An
subscription has exp
paper discontinued, w
by post, otherwise we
its continuance is desir
be paid for. If the pa
at the expiration of th
should be so stated
order.

Receipts for Money—
Journal will be an a
receipt of money to ne
receipt of renewed sul
acknowledged by postc

How to Send Mone
money at our risk by P
cheque or draft, and w
means are available,
stamps by registered le
any other way is at y
no exchange or express
Make all express orders
payable to **The Canad**
Brantford, Ont.

ADVERTI

We are in no way re
losses that may occur ir
advertisers, yet we take
to admit only reliabl
columns.

Rates of Adv

Time	1 in.	2 in.	3 in
1 Mth ..	$2.00	$3.00	$3.5
2 Mths	3.00	4.50	5.5
3 Mths	4.00	5.50	7.0
6 Mths .	6.00	9.00	12.0
12 Mths .	10.00	16.00	20.0

Printing for Bee
HONEY LA
LETTER H
BILLHE

Write us when requi
of any ki

The HURLEY PRIN
Brantford,

The Canadian Bee Journal

Devoted to the Interests of Bee-Keepers

JAS. J. HURLEY, Editor

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

TERMS

$1 per annum; two years, $1.50, payable in advance. These terms apply to Canada, United States and Mexico; to all other countries, 12 cents per annum for postage.

Discontinuances—Any subscriber whose subscription has expired, wishing the paper discontinued, will please notify us by post, otherwise we will assume that its continuance is desired, and that it will be paid for. If the paper is to be stopped at the expiration of the time paid for, it should be so stated when giving the order.

Receipts for Money—The receipt of the Journal will be an acknowledgment of receipt of money to new subscribers. The receipt of renewed subscriptions will be acknowledged by postcard.

How to Send Money—You can send money at our risk by P. O. Order or bank cheque or draft, and where none of these means are available, bills and postage stamps by registered letter. Money sent any other way is at your risk. We pay no exchange or express charges on money. Make all express orders, cheques or drafts payable to **The Canadian Bee Journal,** Brantford, Ont.

ADVERTISING

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

Rates of Advertising

Time	1 in.	2 in.	3 in.	4 in.	1 col.	page
1 Mth ..	$2.00	$3.00	$3 50	$4.50	$6.50	$10.00
2 Mths	3 00	4.50	5.50	6 50	11.00	17.00
3 Mths	4.00	5.50	7.00	9.00	15.00	25.00
6 Mths .	6.00	9.00	12.00	15 00	25.00	40.00
12 Mths .	10.00	16.00	20.00	25.00	40 00	75.00

Ontario Bee-Keepers Association

Organized 1880
Incorporated March, 1886

President—Wm. Couse, Streetsville.
Vice-President—W. J. Craig, Brantford.
2nd Vice-President—W. A. Chrysler, Chatham.

Secretary-Treasurer — P. W. Hodgetts, Department of Agriculture, Parliament Bldg., Toronto.

DIRECTORS

Div. 1—A. Dickson, Lancaster.
Div. 2—A. McLaughlin, Cumberland.
Div. 3—H. E. Eyrie, Chantry.
Div. 4—C. F. Chisholm, Wallbridge.
Div. 5—Jas. Storer, Lindsay.
Div. 6—Wm. Couse, Streetsville.
Div. 7—J. F. Switzer, Orangeville.
Div. 8—U. H. Bowen, Niagara Falls.
Div. 9—W. J. Craig, Brantford.
Div. 10—D. Chalmers, Poole.
Div. 11—Wm. Chrysler, Chatham.
Div. 12—Hy. Johnson, Craighurst.
O.A.C.—Morley Pettit.

Executive Committee—President Couse; 1st and 2nd Vice-Presidents and Secretary.
Honey Show Committee—President Couse, Grainger, Sibbald and Secretary.
Revising Com.—H. G. Sibbald, Claude.
Honey Crop Committee—P. W. Hodgetts, Toronto; Wm. Couse, Streetsville; H. G. Sibbald, Claude; W. J. Craig, Brantford.
Transportation Committee—Wm. Couse, Streetsville; J. D. Evans, Islington; P. W. Hodgetts, Toronto.

Representatives—
Toronto Exhibition: J. D. Evans, Islington.
Ottawa Exhibition: W. J. Brown, L'Orignal.
London Exhibition: F. J. Miller, London.

FOUL BROOD INSPECTORS

1. J S Schrank Port Elgin—Bruce and Huron.
2. D Chalmers, Poole—Waterloo and Perth.
3. William Idle, Clarksburg—Wellington and Grey.
4. W A Chrysler, Chatham—Lambton, Kent and Essex.
5. John Newton, Thamesford—Middlesex and Elgin.
6. James Armstrong, Cheapside—Haldimand, Norfolk, and Welland.
7. W. Bayless, Grand View—Oxford and Brant,
8. Alexander Robertson, Waterdown—Wentworth and Lincoln.
9. Arthur Adamson, Erindale—Halton, Peel and Dufferin.
10. Hy. Johnson, Craighurst — Simcoe, and Muskoka.
11. J. L. Byer, Mt. Joy—Ontario, York, Victoria and Durham.
12. W Scott, Wooler—Northumberland, Peterboro, Hastings and Prince Edward.
13. J. B. Checkley, Linden Banks—Lennox and Addington, Frontenac and Leeds.
14. A. A. Ferrier, Renfrew—Renfrew, Lanark and Carleton.
15. Alexander Dickson, Lancaster — Russell, Prescott, and Glengarry.
16. Homer Burke, Tayside—Grenville, Dundas and Stormont.

Bee-keepers desiring the services of the inspector of apiaries should address their requests to Hon. James S. Duff, Minister of Agriculture, **Toronto, giving nearest railway station and distance of apiary from station.**

Place of Meeting: Toronto. Hall and dates to be selected by Executive.

Clubbing List for 1910

To Old and New Subscribers: Our Clubbing List for 1910 includes the following Remarkable Offers

WE WILL SEND

The CANADIAN BEE JOURNAL

WITH

The British Bee Journal, $1.50 ..	For	$2 25
Gleanings in Bee Culture, $1	For	1 95
The American Bee Journal, $1 ..	For	1 75
Bee-Keepers' Review, $1	For	1 75
Irish Bee Journal, 36c.	For	1.25
The Herald (Montreal)	For	1 50
Montreal Weekly Witness, $1	For	1 75
Montreal Daily Witness	For	3 00
Northern Messenger	For	1 35
World Wide, $1.50	For	1 85
Family Herald and Weekly Star $1	For	1 85
Canadian Poultry Review, 50c.....	For	1 40
The Breeders' Advocate, 50c.	For	1 40
Farmers' Advocate, 1.50.....	For	2 25
Weekly Sun, $1	For	1 75
News (Daily) Toronto	For	2 20
The Horseman (Chicago)	For	3 50

Mail and Empire for $1.50

The Canadian Bee Journal

Brantford :: Canada

The Ca

JAS. J. HU

Vol. 18, No. 9.

Only five exhibitors
National Exhibition, N
Co., Lang, Anguish, A
son. This does not ac
the industry of apicult
ion.

* * *

Don't forget the Nat
Convention at Albany
man's great holiday, a
will have the pleasure
erican cousins. Mr. J
for a paper on "Extra
Nectar to Market."

* * *

Many bee-keepers
pleased to see what w
feature at the Nationa
apicultural section of t
represented by Mr. Mc
his charge there was o
to an eight-frame revei
gasoline engine, an
around which crowds
long. At intervals Mr
tical demonstrations wi
in a bee tent. Mr. Pet
of conveying informati
was greatly appreciate

* * *

A very peculiar and
leled accident happene
in a neighboring coun
were driving along th
which hung some large
under one of these the
struck a swarm of bees
of the branches. The
cut the swarm in two
half dropping into the
laps of the ladies. Of
commotion. A couple
along at the momen
might have proved a se

The Canadian Bee Journal

PUBLISHED MONTHLY

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

Vol. 18, No. 9. SEPTEMBER, 1910 Whole No. 547

Only five exhibitors of honey at the National Exhibition, Messrs. Grainger & Co., Lang, Anguish, A. Lang and Johnson. This does not adequately represent the industry of apiculture in the Dominion.

* * *

Don't forget the National Bee-Keepers' Convention at Albany. It is the beeman's great holiday, and there, too, he will have the pleasure of meeting his American cousins. Mr. J. L. Byer is slated for a paper on "Extracted Honey—from Nectar to Market."

* * *

Many bee-keepers were extremely pleased to see what we believe is a new feature at the National Exhibition. The apicultural section of the O. A. C. was represented by Mr. Morley Pettit, and in his charge there was on view in addition to an eight-frame reversible extractor and gasoline engine, an observatory hive around which crowds collected all day long. At intervals Mr. Pettit gave practical demonstrations with a colony of bees in a bee tent. Mr. Pettit's pleasant mode of conveying information to his audience was greatly appreciated.

* * *

A very peculiar and perhaps unparalleled accident happened a few days ago in a neighboring county. Two ladies were driving along the roadway over which hung some large trees. In passing under one of these the top of the buggy struck a swarm of bees hanging from one of the branches. The top of the buggy cut the swarm in two midway, the lower half dropping into the buggy upon the laps of the ladies. Of course there was a commotion. A couple of men happening along at the moment prevented what might have proved a serious accident.

"Two or three times of late we have "entered a caution against letting bees "clean up exposed wet extracting-combs "in the vicinity of a common highway or "in a locality where neighboring dwell-"ings are very close to each other. While "we still think the caution is a wise one "to put before beginners, we are con-"vinced that under some conditions, an "expert can have his combs cleaned out "in this way to advantage."—Gleanings September 1st.

Have you not noticed that when the combs are cleaned up outside that there is a considerable amount of damage done to the comb, and that a great waste of wax takes place? On the other hand when the combs are cleaned up on the hive, the bees rather improve them, and there is no waste of wax? We have noticed this several times. In cleaning up outside the bees seem to be conscious of robbing something not their own, and there appears to be a vicious tearing down and destruction of the comb in their mad desire to get honey. This seems to be entirely reversed when the wet frames are placed on the hive.

* * *

What is to be the next progressive step in Ontario Bee-Keepers' Association? Undoubtedly it should be along the lines of some co-operative movement for the sale of honey. We have been studying the co-operative movement for some time, and have been amazed as its possibilities have been borne in upon us. The British Co-operative movement is one of the big things of the last half century. Its great growth during the last twenty years has been stupendous. At the coming convention a committee should be appointed to take this matter up, and formulate some

scheme to be submitted to the convention before its close, and receive a mandate to get a scheme in working order by the time the next year's crop arrives. Let a few of the most prominenet bee-keepers take hold of the matter and demonstrate that it can be made a success. In a very short time the others—the doubting Thomases—will follow. In launching a scheme it cannot be expected that all will participate at once, but time and organization will remedy this.

* * *

The other day we devoted an afternoon to a drive in the country. On passing a home where we saw a number of bees we pulled up, and decided on an interview. We found the owner to be a retired farmer, whose name was D. Ramey. He had about twenty-five colonies. We found Mr. Ramey a bright and intelligent man and a good bee-keeper. He is not at present taking a bee journal. He spoke of last spring as a very hard one on bees. if he had not fed he would have lost nearly all of them. His brother, living but a short distance away, who did not look closely after his bees at the critical moment, lost twenty colonies from starvation. By careful feeding from fruit bloom to the opening of clover, he secured over an average of one hundred pounds per colony. Some of his colonies gave him over two hundred pounds. Pretty good results for an old man.

* * *

When at the Toronto exhibition we had the pleasure of meeting Mr. Arthur Laing, who was one of the exhibitors. Mr Laing moved to California to try his fortunes there. He is now back in Ontario, a wiser man. He thinks this is the best all-round country for the production of honey. The price obtained here is about one hundred per cent. higher than that obtainable in the South. With this advantage he believes the choice, all things considered, is with this country. He says we have not begun to keep bees in this country yet. There are men in the south who are working one thousand colonies. Here in the Province of Ontario and the Maritime Provinces we think three or four hundred is a large number. He believes much larger numbers could be worked to advantage. We hope to hear big things from him in the future. He now has had the experience and taken his "object" lessons.

* * *

Our British friends are disputing the expedience of a foul brood law. They will be wise in their day and generation if they adopt it. We in Ontario would not think of doing without it. We have now sixteen inspectors where we had but one before. There are those among us who believe we should have more. We are among that number. We should have one inspector for each county. Our greatest difficulty is to find competent ment to do the work. A busy experienced bee-keeper does not find it to his advantage to accept the position. Some that we know of have accepted the position from purely patriotic motives. But some one must do the work. In England they have county experts who have passed an examination in both the theoretical and practical features of apiculture. Unfortunately for us we have not the material for this in this country. It is to be hoped that a generation hence will produce the men. The reason foul brood is still with us is because we have not had adequate inspection. Bees should be inspected annually. Then the disease would be found before it secured a foot-hold. In the past inspectors have been sent where the patient was reported sick. They are called in to diagnose the trouble. This is similar to calling in the veterinary when the horse is sick. What we want is inspection — thorough inspection — whether the bees are known to be diseased or not. It will take time to bring this about. But this, we think, should be the aim.

MISCELLA

Remarking on W.
in "Gleanings" that be
black net of one's veil,
"But they do in this l
"doubt right that they
"surface, and they wi
"they have a special di
"seen a cluster of cros
"attacking the black h
"in a lady's bee-hat. C
"the rough surface, f
glass." I had a son
perience recently whe
graph of J. L. Byer's
had not long been set
of bees commenced to a
lens of the camera. T
cloth was also an obj
onslaught.

* *

The doctor on the s
the following: "Feedin
"highly commended, L
"being more like a natu
"ter for the health of t
"is the assertion that
"ony or colonies may
"tance without having
"ticipate. Place the
"distant—the further
"hours before night pla
"a frame of honey; ar
"have gathered on it pu
"ered with burlap and
"place of the feeder.
"the next evening they
"be baited."

* *

Samuel Simmins of H
Eng., a bee-keeper of no
world, has an instructive
ings" on "Percolatin
Syrup Feeders." The
graphs explain the prin
"simply to put in the
"water, cold or warm a
"proportion of 2 lbs. of
"of water; and without

t. There are men in
working one thousand
the Province of On-
aritime Provinces we
ır hundred is a large
ves much larger num-
ced to advantage. We
hings from him in the
ias had the experience
ject" lessons.

* *

nds are disputing the
l brood law. They will
day and generation it
in Ontario would not
nout it. We have now
where we had but one
those among us who
have more. We are
r. We should have
each county. Our
is to find competent
ork. A busy experi-
oes not find it to his
ot the position. Some
ave accepted the posi-
patriotic motives.
nust do the work.
have county ex-
passed an examina-
ecretical and practical
ire. Unfortunately for
e material for this in
s to be hoped that a
rill produce the men.
ood is still with us is
not had adequate in-
ould be inspected an-
lisease would be found
foot-hold. In the part
een sent where the
ted sick. They are
ose the trouble. This
g in the veterinary
sick. What we want
norough inspection —
are known to be dis-
rill take time to bring
his, we think, should

MISCELLANEOUS

Remarking on W. Fisher's statement in "Gleanings" that bees do not fly at the black net of one's veil, Dr. Miller states: "But they do in this locality. You are no "doubt right that they do not like a hairy "surface, and they will sting white, but "they have a special dislike for black. I've "seen a cluster of cross bees persistently "attacking the black head of a large pin "in a lady's bee-hat. Certainly it was not "the rough surface, for it was smooth glass." I had a somewhat similar experience recently when taking a photograph of J. L. Byer's yard. The camera had not long been set up when numbers of bees commenced to attack furiously the lens of the camera. The black focussing cloth was also an object of their fierce onslaught.

* * *

The doctor on the same page gives us the following: "Feeding at a distance is "highly commended, L'Apiculteur, 274, as "being more like a natural flow, and bet-"ter for the health of the bee. Interesting "is the assertion that any particular col-"ony or colonies may be fed at a dis-"tance without having other colonies par-"ticipate. Place the feeder some rods "distant—the further the better. Two "hours before night place at the entrance "a frame of honey; and when the bees "have gathered on it put it in a hive cov-"ered with burlap and carry it to the "place of the feeder. At the same time "the next evening they will not need to "be baited."

* * *

Samuel Simmins of Heathfield, Sussex, Eng., a bee-keeper of note throughout the world, has an instructive article in "Gleanings" on "Percolating or Self-Acting Syrup Feeders." The following paragraphs explain the principle: "One has "simply to put in the lump sugar and "water, cold or warm as desired, in the "proportion of 2 lbs. of sugar to one pint "of water; and without any stirring or "shaking up, that quantity of water will "combine with the lump sugar, forming "syrup of the desired consistency for "winter storage; while for spring feeding "or times of scarcity in warm weather a "slightly larger proportion of water will, "of course, act more rapidly.

"The lump sugar is raised or suspended "in a perforated chamber so that it can "not clog or settle in a mass on the main "base of the feeder, and hence in a few "minutes it is reduced to the form of "syrup of the correct consistency. Syrup "cans, as well as large cisterns, were "adapted to the same principle; but where "used as cisterns for reducing large quan-"tities it is found an advantage to place "the sugar in a bag within the metal "strainer."

Mr. Simmins in the same article has something to say on the question of when to feed for winter. He states that in cold localities or where no honey is gathered after August, "there can be nothing but good results to follow when feeding can be finished quickly after that month. "Rapid feeding insures a high tempera-"ture and this high temperature insures "sealing of the combs so stored; then a "dry atmosphere. From that time, with-"out any further attention, breeding will "steadily go on until most of the un-"capped stores will be used up, and "finally sufficient empty cells will be found "just where the bees decide to cluster in "the usual compact mass."

"But there are some localities where it "is quite safe, perhaps safer even to feed "up late, and the surcharged combs will "result in no harm. Even in Canada, "Mr. McEvoy likes to feed his bees up so "that they have no empty cells to cluster "in for some considerable time, the combs "being solidly capped. Doubtless when "wintering indoors in a dry cellar the "owner may find no trouble arises where "his combs are so filled; or if also they "may be largely unsealed, climate and

"methods of wintering will largely modify "the conditions under consideration."

But friend Simmins, McEvoy winters all his colonies **outdoors**, and finishes his feeding, if possible, by the 20th September. He likes to give his bees a long winter rest, and permits no breeding in the off-season.

* * *

The American Bee Journal prints the following letter from a lady bee-keeper: "The first year I kept bees I did not know "a 'king-bee' from a queen, and one day "as I was taking sections of honey out "of the super, using a drygoods box "turned upside down for a table, and a "thin case-knife to pry the honey out of "the super, a bee lit near me on the box. "I said, "You are a funny-looking bee," "and pressed on its back with the flat "side of the knife. I pressed some eggs "out of it. Not for another year did I "know that that funny bee was a queen, "and as she flew away I supposed she "went back to the hive, for I did not see "her again. I have learned since to know "a king from a queen-bee."

"Ohio Bee-Woman."

What charming simplicity! Alas, poor "funny bee"!

* * *

The British Bee Journal gives the following as a test for cane sugar: "Place "some of the sugar in a glass-stoppered "bottle for a few days. If treated with "chemicals, the odor when the stopper "is removed will be disgusting; if, how-"ever, the sugar is pure cane, only the "odor of molasses will be given off."

* * *

The Ontario Department of Agriculture, Bulletin No. 182 on Bee-Keeping in Ontario, has just come to hand. All bee-keepers who have not yet received a copy, should apply for one at once. The reports forms very interesting reading, containing a summary of the replies to questions sent out to bee-keepers in the circulars of May last. Two thousand one hundred and seventy-five of these circulars were despatched to bee-keepers in Ontario, of whom four hundred and eighty-eight replied.

Referring to the condition of bees generally last spring, Morley Pettit, by whom the report has been arranged states as follows: "The very warm weather in "March set up breeding and made the "colonies strong early in the spring, but "very short of supplies and the unfavor-"able weather cut down breeding, much "brood and even whole colonies starved, "but not until in some cases a little epi-"demic of swarming sent many premature "swarms out to suffer or starve in their "new hives. **Those who gave their bees "one-quarter as much attention as they "would give other live stock, fed them "sugar syrup** and will probably reap dol-"lars for dimes in the clover honey sea-"son. In many cases it will take bees at "least two weeks into the clover flow to "get ready for work." The report appears in another column.

W. W.

CATCHING A SWARM

One hot afternon about 5 p.m. in June this year I went to one end of the bee-yard and sat down in the shade of a tree to rest. In about five minutes I heard the noise of a swarm that was clustered on a tree next to the one I sat under. I did not know they were there. I wondered what I could do to catch them. All at once I thought of a plan. I ran and got a sheet that I use to catch bees when they swarm. When I got back they were all off the tree. I rolled up the sheet and pitched it up in the midst of them, about ten times or so. They kept changing from one side to another every time. They did not get into order to fly away, and finally clustered on the same tree that they were on before. I lost no time in wrapping the sheet around them, leaving a little opening at the lower end so that they could go in. I kept them there till late in the evening. Then I put them in a hive and they are there yet.

Peter Cameron.

Purple Valley.

Index

BEE-KEEPING

Bulletin

Morley Pettit, Pro

The information con

has been taken from a

sent out in a circula

1910, to our mailing li

Ontario. This list is

plete; but it is being

to time as names co

sources. We hope th

may not have receive

in May will send thei

partment asking that t

mailing list. For th

has only one hive of b

a bee-keeper as one

hives.

Report blanks were

thousand one hundred

bee-keepers. Reports

four hundred and eigh

eight percent. of thos

blanks did not take

them out. The resu

tus of bee-keeping ca

estimated. While we

failed to send out bla

most extensive bee-kee

incompleteness of our

ganizing of this part

value of this report is

should be if the rank

keepers would take the

a little information wh

The counties which

tions have almost inva

most and best reports,

of the spring meetings

est.

The information obt

ence to local soil and

will not be given in t

being reserved until

can be secured, when

will likely be prepared.

teen the nature of the

produced by plants gro

marked, and presents

ful research.

BEE-KEEPING IN ONTARIO

Bulletin 182.

Morley Pettit, Provincial Apiarist.

The information contained in this report has been taken from answers to questions sent out in a circular, dated May 15th, 1910, to our mailing list of bee-keepers in Ontario. This list is by no means complete; but it is being added to from time to time as names come in from various sources. We hope that bee-keepers who may not have received blanks for report in May will send their names to this department asking that they be added to the mailing list. For this purpose one who has only one hive of bees is quite as much a bee-keeper as one who has a hundred hives.

Report blanks were sent out to two thousand one hundred and seventy-five bee-keepers. Reports were received from four hundred and eighty-eight. Seventy-eight percent. of those who received the blanks did not take the trouble to fill them out. The result is that the status of bee-keeping can only be roughly estimated. While we have inadvertently failed to send out blanks to some of the most extensive bee-keepers owing to the incompleteness of our lists, and a reorganizing of this part of the work, the value of this report is much less than it should be if the rank and file of the bee-keepers would take the trouble to supply a little information when requested.

The counties which have local associations have almost invariably sent in the most and best reports, showing the value of the spring meetings in arousing interest.

The information obtained with reference to local soil and drainage conditions will not be given in this report. It is being reserved until fuller information can be secured, when a special bulletin will likely be prepared. The relation beteen the nature of the soil and the honey produced by plants growing on it is very marked, and presents a problem of careful research.

The summer honey plants reported are uniformly white and alsike clover. Basswood is reported from many of the counties although it does not form the staple source of nectar that it did some years ago. Raspberry bloom is reported as a honey plant in the counties of Bruce, Muskoka, Glengarry, Perth, Prescott, Renfrew and York. Alfalfa is being introduced into many of the counties, but its value as a honey plant in Ontario is very problematical. It does not seem to yield nectar to any extent outside of the irrigated lands of the West. Even if it did, the custom of cutting for hay when only one-tenth in bloom would practically destroy its value as a honey plant. Thistle bloom is one of the ill winds of the careless farmer which blows the bee-keeper some good, but improved methods of farming are limiting this source—fortunately for the general good. Withal, our most dependable source of white honey is alsike. Where this is grown extensively for seed on a good stiff clay, well-kept apiaries are practically certain to yield a splendid average income from year to year.

The prospects for honey this season so far as the honey flora is concerned are almost uniformly fair to good all over Ontario. The following counties report prospects "poor to fair": Carleton, Dufferin, Durham, Essex, Grenville, Haldimand, Kent, Lennox, Middlesex, Muskoka, Prescott, Simcoe, Stormont, Welland, Wentworth, York.

There is a variety of fall honey plants. Buckwheat, of course, is the staple, and is growing in popularity from year to year. Next to it is goldenrod, boneset, and some aster. Second crop red clover yields surplus gathered by some strains of Italian and Carniolan bees. Sweet clover gives considerable surplus in some sections.

The total number of colonies reported for the fall of 1909 is 18,445, for June 1st, 1910, it is 16,729. Roughly caluculating from the percentage of bee-keepers

who sent reports, one would be well within the the limit in stating that there are 100,000 colonies of bees in Ontario this spring. The average number of colonies owned by those who reported is 34.3 each, spring count. Bees have wintered very dell. The 9.3 per cent. loss given by those who have reported is quite light, as some of the most extensive specialists count on an annual 10 per cent. loss in wintering.

Much of the winter loss is not definitely understood, owing to the limitations of our actual knowledge of bee-nature. The reasons given in the report are loss of queens, late weak swarms, starvation, dysentery, foul brood, poor ventilation of the hive or cellar, dampness in hive or cellar, honey dew, robbing, mice, and that indefinite term "spring dwindling." Other cases are covered by the term "winter killed," which is quite true even though of uncertain definition. The whole wintering problem is one of the most frequently stated "difficulties" in the reports.

The condition of bees is very similar all over Ontario. The very warm weather early in March set up breeding and made the colonies strong early in the spring, but very short of stores. This shortage of supplies and the unfavorable weather later cut down breeding, much brood and even whole colonies starved, but not until in some cases a little epidemic of swarming sent many premature swarms out to suffer or starve in their new hive. Those who gave their bees one-quarter as much attention as they would give the other live stock, fed them sugar syrup, and will probably reap dollars for dimes in the clover honey season. In many cases it will take bees at least two weeks into the clover flow to get ready for work.

The proportionate number wintered in cellars and outdoors varies greatly with the latitude. In all the southern and western counties outdoor wintering predominates, while in the north and east cellars are more popular. Some new repositories built above ground are used, but these do not, as a rule give as good satisfaction as the underground cellar well darkened and ventilated. Bees were removed from cellars earlier than usual this year, because of the excessive heat in March made it impossible to keep them comfortably cool in the cellars. This matter of maintaining a proper temperature is one of the chief difficulties in cellar wintering. A few warm days in March make it necessary to set the bees out, then they suffer in their unprotected hives through the weeks of bad weather afterward. The only way to winter bees in the average cellar is to pack and shelter them warmly after setting them out. This the vast majority of bee-keepers will not do, so we recommend packing them warmly on their summer stands in October, for all except the more northerly counties.

Without knowing what extenuating circumstances there may have been in some cases, we would judge that many who wintered outdoors unpacked their hives too early. There seems no reason why bees comfortably packed on their stands should be stripped and exposed to the inclement weather of April and the first half of May. Packing cases should be made so that a super could be put in the hive if necessary before it is unpacked. In fact many leave the hives in the wintering cases all summer. If the cases are individual this method has some advantages, but where six or eight are in a case it is decidedly objectionable, both from the standpoint of convenience of handling, and the distribution of disease which may be in the yard. Bee-keeping in some of the best counties in Ontario is greatly hampered by men clinging to these antiquated hives, when a single honey crop would more than pay for convenient modern appliances.

Very little disease was reported. Men are not usually proud of its presence in their apiaries, although the disgrace is not in finding it present, but only in failing to get rid of it. The Ontario De-

partment of Agricultu
000 this year in a conti
against Foul Brood.
district inspectors in t
reports show that there
for them to do. All
are being visited first, a
wishing to clear up dou
ence of this disease in t
should send word to t
Agriculture at an early
natural that those who
quest for the services of
be more apt to get the
do not.

The report on the r
far too great a percenta
man bees kept through
While these bees have
ities they are no better
in any respect except
whiteness of capping on
they are a sure prey t
Foul Brood which has
trously over many part
States and has done grea
parts of Ontario. It is i
this dread disease so w
Italian bees. On this ac
for other reasons, we wo
that all apiaries in Onta
as soon as possible.

All kinds of hives are
"barn" down through
twelve-frame, ten-fram
Langstroth, the Jones,
lup, Quinby and home-m
man was brave enough to
hives, and the number of
was "Goodness knows
don't." After all, the
one to use is the kind
success with, but when on
or is seeking uniformity
seems nothing to gain and
adopting a hive which is
from everything under the

The chief difficulties wh
have can be summed up i
problems of apiculture—

is a rule give as good
nderground cellar well
lated. Bees were re-
earlier than usual this
he excessive heat in
possible to keep them
n the cellars. This
ing a proper tempera-
hief difficulties in cel-
v warm days in March
set the bees out, then
r unprotected hives
of bad weather after-
ay to winter bees in
s to pack and shelter
etting them out. This
f bee-keepers will not
end packing them
mmer stands in Octo-
the more northerly

what extenuating cir-
ay have been in some
dge that many who
unpacked their hives
seems no reason why
cked on their stands
nd exposed to the in-
f April and the first
king cases should be
r could be put in the
ore it is unpacked. In
hives in the wintering
If the cases are indi-
has some advantages,
ht are in a case it is
able, both from the
enience of handling,
of disease which may
e-keeping in some of
n Ontario is greatly
clinging to these an-
a single honey crop
pay for convenient

was reported. Men
d of its presence in
ough the disgrace is
sent, but only in fail-
. The Ontario De-

partment of Agriculture is spending $3,000 this year in a continuation of the fight against Foul Brood. There are sixteen district inspectors in the field and their reports show that there is plenty of work for them to do. All suspected apiaries are being visited first, and any bee-keepers wishing to clear up doubts as to the presence of this disease in their neighborhoods should send word to the Department of Agriculture at an early date. It is quite natural that those who send a special request for the services of the inspector will be more apt to get them than those who do not.

The report on the races of bees shows far too great a percentage of black or German bees kept throughout the province. While these bees have many good qualities they are no better than the Italians in any respect except possibly in the whiteness of capping on comb honey, and they are a sure prey to the European Foul Brood which has swept so disastrously over many parts of the United States and has done great damage in some parts of Ontario. It is impossible to cure this dread disease so well in any except Italian bees. On this account, as well as for other reasons, we would urge strongly that all apiaries in Ontario be Italianized as soon as possible.

All kinds of hives are used, from the "barn" down through the list of the twelve-frame, ten-frame, eight-frame Langstroth, the Jones, Richardson, Gallup, Quinby and home-made. Only one man was brave enough to say he used box hives, and the number of combs, he said, was "Goodness knows how many, I don't." After all, the kind of hive for one to use is the kind he has the best success with, but when one is just starting or is seeking uniformity of fixtures there seems nothing to gain and much to lose by adopting a hive which is a little different from everything under the sun.

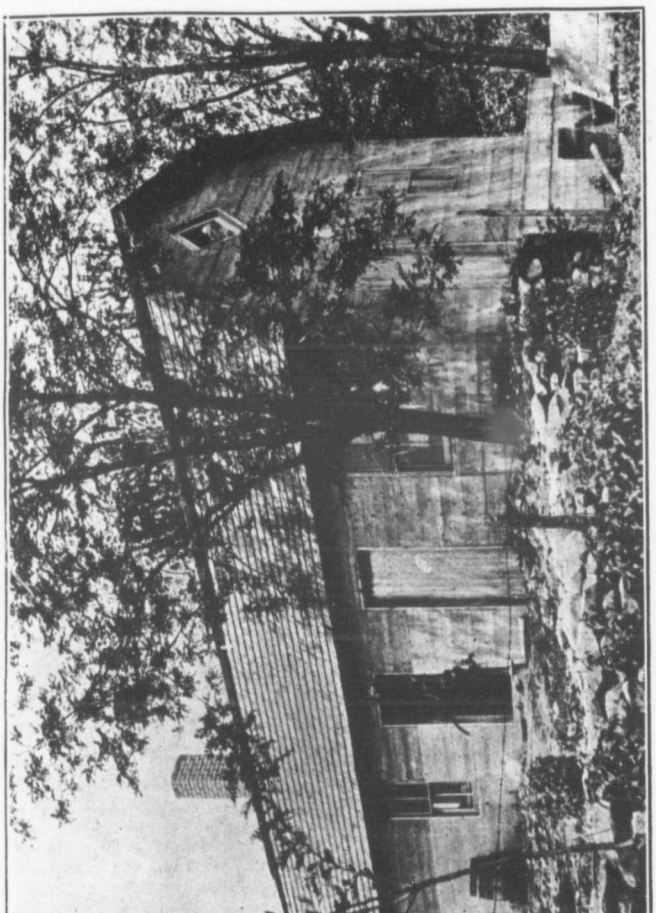
The chief difficulties which bee-keepers have can be summed up in the two great problems of apiculture—swarm control and wintering. In many cases the trouble is summed up in the words of one man who said his chief difficulty was to "get the old woman to watch for swarms." The interest that is taken in this problem of swarm control is shown by the fact that when the Department of Bee-keeping at the Ontario Agricultural College sent out notices that instructions would be supplied to all who cared to conduct an experiment in the control of swarming, more than three hundred and twenty-five men and women from every county in Ontario, and from other Provinces from the Atlantic to the Pacific, made application for the circular of instructions on this important subject.

A great many stated that they had not time to give the bees attention because their busy time came at the same time as the heavy work on the farm. The solution to this difficulty is to have plenty of store combs and supers. Stack these on the hives from time to time as needed, and systematically keep the bees busy and contented, so they will not think of wanting to swarm, then neither the "old woman" nor the old man will be worried getting the swarms down from high trees or seeing them go to the woods.

The wintering problem needs to be just as carefully studied. No colony ever dies without a definite cause, which should be carefully sought out and prevented next time. Plenty of good stores, good queens, warm packing, shelter from winds, all these and many others are factors in successful wintering. If the bees are always prepared for the hardest kind of winter they will get through the easy ones all right.

Prospects are right for prices this year as the markets are bare and honey has become a staple which dealers look for regularly.

[We have pleasure in reproducing the above report of Mr. Pettit. The statistical tables accompanying the report we have omitted for lack of space. We highly commend Mr. Pettit's suggestions on feeding and wintering.—Ed.]



View No. 1—A Michigan Honey House, Work shop and Bee Cellar.

SPRING

J. L.

The writer does n
class of people who
word, even if they h
corner and whisper t
complish their object
ing the Editor's hope
to him again, we ha
take up no more spac
the subject of spring
his attempted analysis
of syrup fed to the be
such a position that
well drop the subject
In July issue, the stat
"80 colonies in one y
other, would clean up
made from 100 pounds
two hours." Now,
two meanings might h
rather obscure statem
to myself, would say t
anyone except the Edi
interpretation as mean
sugar fed to 170 colo
course the amount fe
of syrup every three d
two yards, one of 80
other of 90. How muc
way, to feed the brood
Am fortunate in being
authority, the opinion
men whom the Editor
confidence in, as they a
the business. In the
Mr. C. D. House at
winter of 1906-07, it w
he stated that one-qua
of feed per day was nec
brood-rearing going on
coming in from the
looked up the Journal
port of his address, but
to be correct as I have
itive on this point; as
trouble to review some
from Mr. McEvoy short
ing in Brantford, and in

View No. 1—A Michigan Honey House, Work shop and Bee Cellar.

SPRING FEEDING

J. L. Byer

The writer does not belong to that class of people who will have the last word, even if they have to go off in a corner and whisper to themselves to accomplish their object, and notwithstanding the Editor's hope that we would reply to him again, we had fully intended to take up no more space in the Journal on the subject of spring feeding. However, his attempted analysis as to the amount of syrup fed to the bees has placed us in such a position that we could not very well drop the subject as we had intended. In July issue, the statement is made that "80 colonies in one yard, and 90 in the other, would clean up 175 pounds of syrup made from 100 pounds of sugar, in about two hours." Now, while I admit that two meanings might be taken from that rather obscure statement, yet, in justice to myself, would say that I have not met anyone except the Editor who placed the interpretation as meaning 100 pounds of sugar fed to 170 colonies of bees. Of course the amount fed was 175 pounds of syrup every three days to **each** of the two yards, one of 80 colonies and the other of 90. How much is required anyway, to feed the brood of a strong colony. Am fortunate in being able to give as authority, the opinions of at least two men whom the Editor will have every confidence in, as they are both experts in the business. In the address given by Mr. C. D. House at Brantford in the winter of 1906-07, it will be found that he stated that one-quarter of a pound of feed per day was necessary to keep the brood-rearing going on when nothing was coming in from the field. Have not looked up the Journal containing the report of his address, but this will be found to be correct as I have stated. Am positive on this point; as I have taken the trouble to review some letters received from Mr. McEvoy shortly after the meeting in Brantford, and in one of these letters Mr. McEvoy eulogizes the address of Mr. House, but says that he differs with him on the amount of feed necessary to give a colony as he has found that three-quarters of a pound was nearer the correct amount to feed a colony when nothing was coming in to help along brood-rearing. In spring feeding a syrup made of equal parts of sugar and water is the general practice, although this spring in feeding the outyards, a slightly thicker mixture was used to save hauling so much water from home. At that ratio (equal parts of water and sugar) 100 pounds of sugar would make 3,200 ounces of syrup—40 ounces per colony in a yard of 80 stocks, for each three days. This would mean a bit over 13 ounces per day, or in other words over three-quarters of a pound each colony per day. Surely at this rate of feeding according to the testimony of the authorities given, we were giving all that was required. Don't you think so? Aside from the opinion of others in the matter, we wish to say that while there are a lot of things we do not know about bees, yet we believe we should be ashamed of ourselves if we did not know if brood was suffering or not. As a matter of fact, repeated examinations of many colonies from time to time, always showed unsealed stores among and around the brood. Then, at home the bees were fed with feeders in the hive, and quite a lot heavier feeding was done than was the case at the two outyards, yet in every case the results turned out the same, as the few colonies heavy in honey at the home yard that were not fed a drop, were without exception the best in the lot when the clover opened Mr. McEvoy has repeatedly said in public and has written me many times that he would not feed a drop before fruit bloom, as for every bee raised by the stimulation of early feeding, two old ones would be worn out caring for it. The weather between fruit bloom and clover this season, was like the weather generally a month earlier, and there is no

question in my mind, that my old bees were lost in a vain attempt to get pollen which was absent in the hives at this time. As we have stated before, the brood in our hives did not suffer during all the cold weather—why such was the case when others report to the contrary we can not explain,— **but** at the close of our feeding the old bees dropped away by the thousands. Yet, for all that, I know that our bees were in **fair** shape at the beginning of the harvest, but they were not literally boiling over as they must be to be able to get a large surplus when the flow is very poor as it was this season after the first six or eight days of clover bloom.

Really, I feel like apologizing to the readers of the Journal for taking up so much space as I have done, and with this we promise that it will take something out of the usual order of events to stir us up to say anything more in this line for some time to come. Just a word regarding the Editor's coment on Friend Ferrier'se letter. He says: "Your experience but confirms the position we took this spring in the matter of feeding." Please note that Mr. Ferrier fed his bees only three or four days, and then only to avoid starvation; and as to feeding for stimulative purposes he says that it is a "delusion and a snare." We have taken that position in the discussion on spring feeding, and never for a moment questioned the matter as to fed rather than let the bees starve. In that respect Mr. Hurley would have to agree with me too, for it surely would be a fool of a bee-keeper that would not feed rather than let his bees starve, i.e., if he knew they were about destitute of stores. We were discussing an entirely different phase of the question of feeding, and on that particular phase there is, and will be, a lot of differences of opinion for some time to come, although we believe that it is no idle statement to say that the number of **spring** feeders are decreasing each year, and more and more are bee-keepers learning that the secret of successful wintering, is to have an abundance of sealed stores in the hives during the winter and early **spring.** Certain it is that with my present ideas on the matter, would think that the shabbiest trick I could play on a beginner asking me for information, would be to tell him to give his bees just enough in the fall to carry them through, and then feed them sugar syrup in the spring till clover bloom. We tried the game ourselves two or three times, and learned the lesson thoroughly, and while experience of that nature is pretty expensive, yet after all it is generally quite effective.

J. A. McKinnon.

In the fall of 1909, I got from different parties twelve swarms of black bees, all second and third swarms that I had to drum out of hives of every description. Not knowing any better I fed them on sugar syrup, half and half, and wintered them along with thirteen other colonies in the cellar. The most of them were wintered on four, five and six extracting combs, that had very little or no pollen, and as I got them about October 1st, they had no time to lay in a supply. Not one ounce of honey was fed these bees. They were taken out of the cellar last March, and placed on their summer stands. On looking through them about three weeks later, I found about half of them on the verge of starvation. Not having enough division board feeders, I fed in the comb; that is, on a warm night about dusk, I removed the outside comb and shook the bees at the entrance. I held the comb flat over a wash pan and filled with sugar syrup half and half. A wired frame with full sheet of foundation was put in next the first brood comb. At the next feeding I would find the foundation partly drawn out. I would then spread the brood and insert this sheet of foundation between, and worked this way until all had their full sets of combs, then a full set of frames, with full sheets of foundation was placed on top, and the queen

allowed full swing if s
At the beginning of c
frame of brood in the
filled with foundation,
cluder on top; shook
the entrance and plac
foundation with the
over all; nine days
venience), I used this
Now for the results.
got from T. W. Jones
troduced to one of thes
fall and worked on th
me over 250 pounds o
sides enough brood to
and, with possibly a
brood from another col
are good strong colonie
I had some blacks t
well, and my average
count, will be 200 pou
little over.

Pretty good locality
know; there are bee h
of me here that did n
surplus honey to grease
I got two small swarm
did not consider them
winter. He wintered f
increased to seven. On
from him, that "had b
vitality on sugar syru
pollen in the early spri
the same locality, gave
of honey than he got
Perhaps it was in the sm
They were pretty high
over fifty Italian queen
sides buying a good
strains; not that I coul
ence in gathering quali
thing I do like the Italia
simply wont be robbed-
to start in their shanty
my young Italian queens
in mating, and if there i
tario for bees with lon
them.

Just a word about th
lees in the spring. T

allowed full swing if she cared to go up At the beginning of clover, I placed one frame of brood in the centre of the hive filled with foundation, with a queen excluder on top; shook bees and queen at the entrance and placed another hive of foundation with the two hives of brood over all; nine days after (or at my convenience), I used this brood for increase. Now for the results. An Italian queen I got from T. W. Jones, Bedford,P.Q, introduced to one of these small swarms last fall and worked on the above plan, gave me over 250 pounds of white honey, besides enough brood to start four colonies, and, with possibly a frame or two of brood from another colony. These four are good strong colonies at this date.

I had some blacks that did almost as well, and my average per colony, spring count, will be 200 pounds, and perhaps a little over.

Pretty good locality? Well, I don't know; there are bee hives within a mile of me here that did not produce enough surplus honey to grease a pan-cake.

I got two small swarms from a friend. He did not consider them strong enough to winter. He wintered four of his best and increased to seven. One of the two I got from him, that "had been using up their vitality on sugar syrup and looking for pollen in the early spring," in practically the same locality, gave me more pounds of honey than he got from his seven. Perhaps it was in the smoking I gave them! They were pretty high strung. I raised over fifty Italian queens this season, besides buying a good many of different strains; not that I could see much difference in gathering qualities; but the one thing I do like the Italians for is that they simply wont be robbed—it is not allowed to start in their shanty. Quite a few of my young Italian queens met black drones in mating, and if there is a market in Ontario for bees with long stings, I've got them.

Just a word about the care I gave my bees in the spring. The weakest hives were given a $\frac{3}{4}$" x $\frac{3}{8}$" entrance and the strongest 2" x $\frac{3}{8}$"; these were increased in width as the weather warmed up during the honey flow. My strongest colonies were raised on four blocks, besides raising the cover at the back, I had very little swarming, but increased to 73 good strong colonies, and am getting enough more to winter 90. However, I will see to it that all have enough honey to last until fruit bloom, as spring feeding means a lot of extra work, and can only be done safely when the weather is warm—nothing below 60°. I had all my hives covered with old carpets, bags, etc, with black tar paper to draw the heat and shed the rain. However, I will say this about spring feeding. If it is done right—that is if the bees are shaken off one of the outside combs and three or four pounds of feed given at a time and the hives kept warm with small entrance, the results will be all right.

I thought I would lighten my part of the work by feeding in the open air, but when I saw Jones' Italians pulling the feet off my blacks and fighting everything around the place they got no more.

Who said the Italians were a weak race? Put out a dish of feed and see who is boss there! I venture to say one hive of Italians will steal more feed out of that dish than ten colonies of blacks. If you don't believe me try it, or call around some day and I will show you.

Indexed

By Ami 2 R.

I have been much interested in the recent discussion on the above subject in the C. B. J. The frankness of Mr. Byer in speaking on, and speaking plainly even when chronicling his failures, is admirable. Perhaps if more apiarists would do the same it would help us beginners.

Spring dwindling is perhaps the greatest and most difficult problem that confronts the bee-keeper. It seems to me capable of but one solution, and that is a union of effort on the part of those interested, that can only be brought about by careful thought and concentrated ex-

periment. To the writer, who has had something to do with the domestic animals, usually found upon Ontario farms, it seems that the apiarist like the groom, the shepherd or the cattleman, must study the nature and habits of his stock, and become acquainted with the environment and treatment under which individual herds or flocks thrive best. Some will say at once, this is impossible with bees! It certainly would with individuals, but not with colonies. It is far better that a colony that has sufficient stores should not be fed at all than that it should be over-fed. The writer's experence proves to his utmost satisfaction that the colony that has very little stores when the honey flows begins will do far better than the heavy hive that is in a position to have no fears for the immediate future.

Yes, aim at keeping bees always at work when there is work to do, and anxious to get work even when there is no work to be had. To do this is not an easy task, for none can tell exactly how much money a certain hive will require for winter. We ought to aim at having some to spare, and then examine each colony in the spring and only feed those that actually require feeding. We never feed indiscriminately, but try to mete out to the needy colonies according to their respective requirements, being at the same time careful to not let any reach the starvation limit. One experiment with a young hive that went into winter weighing only 37 pounds, took some feed (syrup) in the spring. It gave a good swarm and a lighter one later; also some surplus in the supers. Another, the sick of the yard, weighed 85 pounds, and died honeyless in early April. Now, if the lighter of these colonies had not been fed, or if the heavier one which was wintered in very cold quarters, had been fed and kept warmer, the results would certainly have been quite different.

With regard to the difference in Mr. Byer's apiaries, I am inclined to think that there were some cause or causes that he has not given—perhaps does not know of—for the different results.

In this part of the province (Brockville District), we have had a satisfactory season with the bees, which are now busy (Sept. 6th), on a wide expanse of buckwheat.

PROGRAM OF THE NATIONAL BEE-KEEPER'S ASSOCIATION

The National Bee-Keepers' Association will hold its annual convention October 12th and 13th, in the Common Council Chamber, in the City Hall, Albany, New York.

There will be five sessions, beginning with the first on the 12th, at 10.30 a.m., an afternoon and evening session, and a morning and afternoon session on the second day during which the following program will be taken up.

The papers selected are to take up not more than five minutes each, so that there will be sufficient time for discussion of the subjects; and also allowing ample time for the "Question Box," which is to be taken up at the conclusion of the subjects on the regular program at each session.

October 12, Morning Session, 10.30.

The first session will open with the reception of members, paying of dues, and such other matters, so these will not interfere after the regular program is taken up.

"Bee-Keeping as a Business," F. B. Cavanagh, Hebron, Ind.

"What a Woman Can Do With Bees," Mrs. S. Wilbur Frey, Sand Lake, Mich

October 12, Afternoon Session, 2.00

"Comb Honey—from Nectar to Market," S. D. House, Camillus, N. Y.

"Extracted Honey—from Nectar to Market," J. L. Byer, Mt. Joy, Ontario, Canada.

"Bulk Comb Honey and Its Future," Louis H. Scholl, New Braunfels, Texas.

"Ripening Honey on the Hives," W. P. Southworth, Salix, Iowa.

October 12, Eve

"President's Addr
Chicago, Ill.

"Selection in Bree
Honey Crop," Ge
River, N. Y.

"Co-operation Am
Advantages and
Rauchfuss, Denver, (

October 13, Morn

"Advertising to C
mand for Honey," F
N. J.

"Methods of Retail
Foster, Boulder, Colo

"Shipping and Grad
Root, Medina, Ohio.

"Methods of Rende
H. Boardman, Collins

October 13, Aftern

"When and How t
Fall Honey Flow," F.
go, N. Y.

"Southern Honey I
Conditions and Future
J. Wilder, Cordele, G

"Bee-Keeping in M
It," N. W. Saunders, S
Rockville, Md.

"Question Box" after
Louis H. S

INTERESTING GE

Translated by Jac

Wind and Nectar

I just noticed the rem
tung that in a northea
hive does not show an i
even in warm sunny w
say that I paid particula
fact the past season, (
honey flow. We had
and northeast wind,
warm temperature, but t
only one or two pounds
At one time during the
clover flow we had fou
wind, and the scale show

October 12, Evening Session, 8.00

"President's Address," Geo. W. York, Chicago, Ill.

"Selection in Breeding to Increase the Honey Crop," Geo. B. Howe, Black River, N. Y.

"Co-operation Among Bee-Keepers — Advantages and Procedure," Frank Rauchfuss, Denver, Colo.

October 13, Morning Session, 8.00

"Advertising to Create a Larger Demand for Honey," F. J. Root, Newark, N. J.

"Methods of Retailing Honey," Wesley Foster, Boulder, Colo.

"Shipping and Grading Honey," H. H. Root, Medina, Ohio.

"Methods of Rendering Beeswax," H. H. Boardman, Collins, Ohio.

October 13, Afternoon Session, 2.00

"When and How to Re-queen with a Fall Honey Flow," F. H. Cyrenius, Oswego, N. Y.

"Southern Honey Production—Present Conditions and Future Possibilities," J. J. Wilder, Cordele, Ga.

"Bee-Keeping in Maryland, as I See It," N. W. Saunders, State Entomologist, Rockville, Md.

"Question Box" after each session.

Louis H. Scholl, Secretary.

INTERESTING GERMAN ITEMS

Translated by Jacob Haberer.

Wind and Nectar Secretion.

I just noticed the remark in M. B. Zeitung that in a northeast wind the scale hive does not show an increase of weight even in warm sunny weather. I might say that I paid particular attention to this fact the past season, during the white honey flow. We had very much north and northeast wind, with even fairly warm temperature, but the scale hive told only one or two pounds or nothing at all. At one time during the latter part of the clover flow we had four days of north wind, and the scale showed one pound per day. The next day the wind shifted to south east; the temperature remained about the same as before, but the scale went to 5 pounds; next day with west wind the scale showed two pounds. I observed this matter very closely up to date, and find little nectar yielding if north or northeast winds are blowing. During our basswood bloom we had a great deal of north wind; the bees looked a little after the distils and gave very little attention to the basswood trees. But in one of my outyards basswood bloom was a few days later and longer, and showed a remarkable difference. The wind had left the north and a fine little basswood honey crop was the result there.

If anyone paid attention to this matter this year, he must save found that we had to a very great extent northwest winds during July and later with even fair weather, and south wind seldom longer than a day; but during the last few weeks it has reversed—a great deal of south wind. What is the result? Fall honey is rolling in. Golden rod has not yielded very much for years, but it is yielding well this year—at least in this locality. It is a pity the honey has not a better aroma. The odor in the yard is at present so strong that I hate to work there.

Requeening

All these later years I have thought that re-queening (or introducing queens), was an easy matter, but strange to say, I lost the most of my introduced queens this year by using my usual system—the candy plan. They had cells started when I looked after the queen where there was an opportunity. I believe the great excitement of the bees during this fall flow is the reason. And the reason for the ex extreme excitement is the very strong odor of this fall's honey. Now, during clover bloom I could expose combs for hours and bees would not look after them, but during this fall they are after an exposed comb in a few minutes and all work has to be done carefully, even if honey is coming in heavily.

Bicycle Sport and Honey

One of the best bicycle enthusiasts, Cremieux-Junin, recommends to his sport colleagues the use of honey! He tells of how he was one day struck with the idea of using honey instead of Caffeine or Kola as a stimulant. The result surprised his expectations. He says he suffered less from thirst, and the sweating also got less. As the honey is easily absorbed, it will give the muscles new strength and new life without overloading the body with much fluidness. At first he was afraid it would cause much thirst, but the result was contrary to that; it does not even cause or leave a slime in the mouth, but gives strength and energy. He gives the following meal table. In the morning at 8 o'clock ordinary breakfast; at 11 o'clock, 60 grams. honey; at noon 70 grams.; at 2 o'clock 60 grams.; at 4 o'clock 60 grams. Then one cup of tea and dinner at 7.30 o'clock.—Muncher B. Zeitung.

Capturing Swarms

If many swarms cluster together, the easiest way to divide them is: Fasten a few green limbs in a large wash tub; throw your swarm in, cover with a wet cloth and the division will take place. In about an hour you will find each swarm on a separate limb.—T. Wegweiser.

Early Breeding

T. Baum in Th. Bienenzeitung of July, thinks that "too early breeding is not so much in the race of the bees as in a disarranged brood chamber; that is there is too much pollen in the centre of the brood nest, often put there by the beekeeper in arranging brood combs thoughtlessly. The consumption of pollen will lead to early breeding." I believe we are not always careful enough here.

POSSIBILITIES OF APICULTURE

Larger Consumption of Honey and Wax.

It is not often that honey and wax are made a subject for consideration in the Weekly Trade Reports issued by the Dominion Government. In the last report, however, we find a very startling reference, (No. 346). It appears to be a clipping taken from the "South African World," and sent to the Government by one of its trade commissioners:

Honey and Wax

An African authority declares that a boom in honey is impending. He says that prices will begin to advance shortly and continue during 1911, and for several years to follow honey—and beeswax, too—will show such a sharp rise that beekeepers will reap veritable golden harvests.

One of the causes underlying the coming boom is the increasing deficiency in the world's supply of honey. Excepting perhaps the Central and South American Republics and Cuba, there is an enormously increasing deficiency in the world's supply of honey and wax. The huge world's production of 300,000 tons of honey per annum falls short of the demand by thousands of tons. The United States, with California as the paradise of the beekeeper, produce annually £4,000,000 of honey and £500,000 of wax, but this is short of the demand by 2,500,000 pounds of honey and 750,000 pounds of wax. Other countries are in the same predicament. The habit of eating honey in the place of jams is spreading throughout the world, because of its highly nutritive and wholesome nature. Medicine is using enormous quantities as a demulcent and flavoring agent; but above all, experience has proven that cakes, biscuits and sweetmeats made with honey keep far better than those made with sugar, and popular taste has decided that they are "much nicer."

In the wax market conditions are even still more promising for the bee-keeper. In ancient times the use of wax was limited to the coating of writing tables and to the modelling of figures. But to-day we have found a hundred uses for beeswax, and are still finding more. Our finest altar and carriags candles are made of bleached beeswax, and in the raw state it is used for waxing thread and waxing polished floors. In lithography it is in demand for making crayons. It is an essential ingredient in many varnishes, and a necessity as a "resist" in printing paterns on calico.

Laundries use it as a polish for finishing starched articles, chemists as a base for salves, plasters and ointments, and dentists for taking impressions of the mouth. The industry of making artificial flowers employs hundreds of persons. Thousands of tons are used every year for tailors' and hairdressers' dummies; and anatomy, pathology, and embryology in every country spend vast sums on wax models for educational purposes.

BROOD DISEASES OF BEES AND THEIR TREATMENT†.

Burton N. Gates, Ph.D., Inspector of Apiaries, Amherst, Mass.

There is undeniable proof of the occurrence in Massachusetts of two distinct brood diseases of bees, American foul brood and European foul brood, which cause inestimable loss to bee-keepers, and directly to orchardists and growers of cucumbers under glass. Each of these diseases attacks the developing brood, and each results in a marked reduction of the population of a colony, if not its death. Also, the adult bees are rendered inactive, making diseased colonies of bees unproductive. Each disease, if untreated, may destroy entire apiaries, as has been commonly experienced.

A preliminary study of the occurrence of these diseases in Masachusetts was published in 1908 as a bulletin entitled "Bee Diseases in Massachusetts."§ Since then there has been enacted by the General Court a law "to provide for the appointment of an inspector of apiaries and for the suppression and control of contagious bee diseases," which appears on page 10. The Inspector of Apiaries solicits the cooperation of each bee-keeper in the state, and will gladly examine samples of broods believed to be diseased. These should be mailed according to directions on inside front cover.

American Foul Brood.

Cause—The cause of American foul brood is definitely known to be a germ or bacterium, bacillus larvæ White, which kills the developing brood.

Appearance—The brood is usually attacked about the time that the cells are capped. The larvæ (grubs) die, decay begins and the cappings of the cells become sunken and perforated. A comb in this condition presents a scatered and irregular arrangement of the brood. The larva or grub when first affected turns a light chocolate color, gradually darkens, and in an advanced stage becomes the color of roasted coffee. If a toothpick is inserted into a dead larva, and then slowly removed the decayed material often adheres and stretches an inch or more before breaking. This is spoken of as "ropiness." The decayed brood has a characteristic odor, resembling a poor quality of glue,—the "glue-pot" odor. Finally the broken-down tissues, having sunken to the lower

†This paper has been compiled largely from "Brood Diseases of Bees," by E. F. Phillips, Ph.D., Bureau of Entomology, United States Department of Agriculture, Circular 79, and from the present writer's publication, referred to below.

§ "Bee Diseases in Massachusetts," by Burton N. Gates, Bureau of Entomology, United States Department of Agriculture, Bulletin 75, Part III., and also published by the Massachusetts Agricultural Experiment Station as Bulletin 124. A copy may be had free by addressing Director, Massachusetts Agricultural Experiment Station, Amherst, Mass. To these the reader is referred for more detailed accounts of brood diseases.

walls of the cells, dry down into a characteristic mass sometimes called a "scale," which adheres closely to the cell. These scales can be removed only with difficulty, and are frequently diagnostic. Larval queens and drones, it has been found, are seldom atacked. The disease, however, apparently affects the activity and vigor of the adult workers.

European Foul Brood.

European foul brood is the most disastrous and widespread of bee diseases in Massachusetts, but is the most difficult to diagnose from gross examination.

Cause—The cause of this disease has not yet been announced, but it is believed to be a specific, bacterial organism.

Appearance—The larvæ (grubs) are attacked at an earlier stage than is the case in American foul brood, the majority dying before they are sealed. When first affected the larva shows a minute yellow spot on the body near the head, and usually is restless in the cell. The disease soon kills the larva, which turns yellow, then brown, and finally almost black. When a stick is inserted in the decayed mass the tissues usually do not stretch out, but the ropiness, which is characteristic of American foul brood, occasionally does occur in European foul brood. Finally, when the decayed mass dries down, there is formed an irregular scale, which is only slightly adherent to the lower cell walls. The odor of the decaying brood is not the "glue-pot" odor of American foul brood, but, if any is noticeable, it suggests a sour, yeasty smell. This odor may not be characteristic. European foul brood attacks both queen and drone larvæ. The disease spreads rapidly, being extremely infectious in the spring and early summer, but may seem to disappear in the late summer and autumn, only to reappear another season, which is said never to occur with American foul brood. The vigor and activity of the adult bees are affected.

Treatment

Treatment—Both American foul brood and European foul brood are successfully treated by the same method.

Drugs—Various drug treatments have been recommended for spraying, feeding and fumigation, but bee-keepers are urged to regard these as absolutely worthless in combating brood diseases, as has been proved by experiment.

Shaking Treatment—Shaking is the treatment which is recommended by the United States Department of Agriculture, and is pronounced satisfactory throughout the United States. The key to successful treatment is the removal of the bees from infected material.

Prepare a clean and uninfected hive, preferably with new frames containing half-inch starters of foundation. The diseased colony should then be drummed or shaken into the new hive containing the narrow strips of foundation, care being taken not to allow honey to drop from the infected combs. In this way none of the infected honey becomes deposited in the new cells, but is consumed in constructing them. If desired, the bees may be drummed or shaken first into a clean box and then hived on starters. The box should afterwards be burned. Some bee-keepers prefer to shake on to a paper spread before the entrance of a new hive, the bees being allowed to "run in"; in this way the paper catches any infected honey which may fall from the combs, and may be burned later. Several weak colonies may be shaken together to form one colony in strength equal to a good prime swarm. One queen may be caged temporarily, or the colonies may be united, regardless of the several queens.

Shaking should be done so as to prevent robbing and thus the spread of the disease. This may be accomplished in a building, within a screen cloth cage, or in the evening, but preferably when there is sufficient honey flow to prevent robbing.

be modified, using a bee escape instead of shaking the bees from the combs. The infected colony is removed from its stand, and a clean hive with starters set in its place. The queen is at once transferred to the new hive, where she is joined by the field bees. A bee escape is fitted to the entrance of this old hive, so that the bees of the diseased colony can leave but not enter it, and the infected hive is either placed on top of or close beside the new one. In this way the bees from the old hive will join those in the new one. The shaking method will be found the easier and quicker, however.

With either of these methods, in order to prevent the bees from deserting the strips of foundation, it is well to shade the hive, cage the queen or cover the entrance with perforated zinc until the colony is well established with brood.

Second Treatment

It is frequently necessary to give a second treatment by shaking the bees on to a new foundation, either starters or full sheets, in new frames, four or five days after the first treatment. The comb made after the first treatment should be melted for wax and the honey disposed of so as not to come in contact with bees.

Disposal of Infected Material—Too great care cannot be exercised in disposing of infected materials in order to keep them away from healthy bees. All of the products of the infected hive, brood, wax and honey, and the hive furniture, bottom boards, covers, hives, frames and supers may be saved provided their value warrants a little labor.

Care of the Brood—Healthy brood in infected combs, provided it will be profitable, may be tiered above a queen-excluding zinc, on a weak colony which is diseased After a week or ten days all the bees which are worth saving will have emerged. This colony, now strengthened, should be treated.

Care of the Brood—Healthy brood in general occurrence of brood diseases, and since honey is the important medium in the transmission of brood diseases, it is not safe to feed honey, unless boiled, to bees. Honey from infected colonies is, however, considered wholesome for human consumption. To render honey sterile and safe for feeding it should be diluted with equal parts of water and boiled hard for nearly or quite an hour. Candy for queen cages and feeding should be made from sterilized honey.

Care of Wax from Infected Colonies—Wax from diseased colonies should be rendered over fire; the solar wax extractor should not be used. Wax when made into foundation is considered safe.

Care of the Hive Furniture—All parts of hives in which infected colonies have been should be scraped clean, and the refuse particles of propolis and wax burned. Frames and section boxes, being inexpensive, are usually also burned. The inside parts of hives, after being thoroughly scraped, should be sterilized by fire. A gasoline torch is commonly used, but any method which will char and blacken the wood will be satisfactory. Cracks, corners and crevices must not be neglected. A hive thoroughly flamed is safe to be used again.

The Spread of the Diseases

Especially in the decayed brood, in the resulting dried scales, in the honey and pollen of an infected colony, there occur innumerable germs or spores of the disease organism, each capable of growth and production of the disease. These spores are the resting stage of the organism, are resistant to heat and cold, dryness and antiseptics, and may be compared to seeds of the higher plants. In contact with the living tissues of the larval bee, these spores may germinate, grow, reproduce and multiply. Thus, if infected material comes in contact with a

healthy colony, there is great danger of the spread of the disease. Honey, particularly is an important means of its dissemination. Every bee-keeper should realize, therefore, that each case of either brood disease is capable of infecting all the bees within a radius of several miles.

Robber Bees—Robber bees are known to be one of the chief agents in spreading the disease. If a colony dies, no matter from what cause, do not risk the removal of the remaining stores by robbers, but immediately close up the hive bee-tight and remove it to a building secure from bees. If a colony is discovered to be diseased, contract the entrance and protect it from robbers; then treat.

Honey—Honey has been shown to be the chief medium for the transmission of the disease germs. Consequently feed no honey unless thoroughly boiled. Leave no honey about where bees may possibly get at it. Do not allow bees to clean up scraps of comb, section boxes, partially filled supers or tools smeared with honey. In treating, take care that the honey of the infected colony does not shake out into the new hive or on to the ground.

Caution

Prevent robbing.

Clean up the bee yard.

Do not feed honey unless boiled.

Have a sample of brood examined if a colony dies, fails to build up or dwindles.

Treat colonies immediately upon determining that they are diseased.

Combs, supers, section boxes, etc., should not be transferred from hive to hive in an infected apiary.

Melt up old combs; burn the refuse.

When handling infected material, and after treating a diseased colony, as a precaution, disinfect the hands, tools, etc., with a 5 per cent. solution of carbolic acid, or a solution of 1 part of corrosive sublimate (mercuric chloride) to 1,000 parts of water.

In introducing queens, the candy in the mailing cage should not be put into a healthy colony. It is safer to remove the queen to a sterile cage and introduce her, unaccompanied by her escort of workers.

In purchasing bees, the buyer should be certain that he is getting stock free from disease.

Bee-keepers in the vicinity of greenhouses where bees are used to fertilize cucumbers should insist that discarded hives and combs are not thrown out, exposed to the access of robbers. If of no value to the cucumber grower, such material should be burned.

Do not be mistaken in believing that the so-called "bee moth" or "wax moth" causes the loss of a colony of bees. The destruction by this insect is usually secondary; frequently one of the brood diseases is primary, and the "moth" enters as a direct result of the depleted condition of the colony.

Other Diseases of Bees

There are several other diseases or so-called diseases of bees, among which may be mentioned chilled brood, over-heated brood, starved brood, pickled brood, dysentery and paralysis.

THANKS

(Miss) Hannah Willson

I am sending you money order for the sum of $2.00 in full payment of my subscription up to April, 1911. I would not care to be without the Journal, as I find so many suggestions and helps in it. I congratulate you on the improvement which you have made, and hope your subscription list may increase rapidly, as yours is a very worthy and necessary publication, and deserving of the patronage of Canadian apiarists.

THE ANATOMY

Indexed

Now that the hon
to a close and nig
many bee-keepers
ward to devoting a
ure hours to reading
good sign that the d
ature should be rapi
day is past when be
fied with rough and
it is universally reali
pends in a large me
knowledge of the life
bee.

From the very earl
has been the subject
and of deep study.
in his "Lore of the
the gradual process of
has taken place since
wrote. To the ancien
place of mystery and
doubt we have as gre
derment in the truths
modern methods of inve
the introduction of t
hive has dispelled alm
mystery that formerly
ject. No one possesse
conception of the grand
or views it in truer pe
thoughtful observer of
of life. Nothing, perh
destinies of mankind so
things about us. We
therefore that the stud
no unprofitable study.
possesses great advant
such a study, for his d
him almost unconscious
relationship with the in
ordinary naturalist doe
the spirit of the creatures
ing as does the bee-keep
the latter, the bee posses
ity clearly distinguished
traits. Maeterlinck ex
clearly, his eloquent wo

THE ANATOMY OF THE HONEY-BEE.

Now that the honey season is drawing to a close and nights are lengthening, many bee-keepers will be looking forward to devoting a portion of their leisure hours to reading and study. It is a good sign that the demand for bee literature should be rapidly increasing. The day is past when bee-keepers were satisfied with rough and ready systems and it is universally realized that success depends in a large measure upon accurate knowledge of the life and habits of the bee.

From the very earliest times, the bee has been the subject of much speculation and of deep study. Tickner Edwards in his "Lore of the Honey Bee" traces the gradual process of enlightenment that has taken place since Pliny and Virgil wrote. To the ancients the hive was a place of mystery and wonder. Without doubt we have as great cause for wonderment in the truths revealed to us by modern methods of investigation, although the introduction of the moveable-comb hive has dispelled almost completely the mystery that formerly invested the subject. No one possesses a more accurate conception of the grand design of nature, or views it in truer perspective than the thoughtful observer of the lowlier forms of life. Nothing, perhaps, influences the destinies of mankind so much as the tiny things about us. We may be certain, therefore that the study of insect life is no unprofitable study. The bee-keeper possesses great advantages in pursuing such a study, for his daily labors bring him almost unconsciously into intimate relationship with the insect world. The ordinary naturalist does not enter into the spirit of the creatures he may be studying as does the bee-keeper. In the ages of the latter, the bee possesses an individuality clearly distinguished by characteristic traits. Maeterlinck explains this fact clearly, his eloquent words helping us to realize more vividly than the precise teachings of the merely scientific man, how nearly akin we are to such a humble member of the living creation.

Most bee-keepers, however will prefer to regard the subject of bee study in a purely practical light. In a work that has recently reached us from the U. S. Department of Agriculture the preface commences with the following words: "The anatomy of the honey bee has been for years a subject of much interest to those engaged in bee-keeping both for pleasure and for profit. This interest is due not only to a laudable curiosity to know more of the bee, but to the necessity of such information in order to understand fully what takes place in the colony All practical manipulations of bees must depend on an understanding of behavior and physiology of bees under normal and abnormal circumstances, and those beekeepers who have advanced bee-keeping most by devising better manipulations are those, in general who know most of bee activity. In turn, a knowledge of bee activity must rest largely on a knowledge of the structure of the adult bee."

The foregoing passage well describes the importance of the study from the point of view of the practical bee-keeper. We trust that at some early date there will be introduced into this country a system under which no man will be permitted to hold any position as a recognized expert or inspector, who has not, under examination proved his acquaintance both with the theoretical and practical sides of bee-keeping. We have met several prominent bee-keepers who strongly advocate the same view.

Until recently the only works in our language dealing with the anatomy of the honey bee in a comprehensive or exhaustive manner were those by the late Frank Cheshire, and the venerable president of the British Bee-Keepers' Association, Mr. T. W. Cowan, two authors to whom bee-keepers generally are much indebted. The

value of Cheshire's and of Cowan's studies has been fully appreciated by scientists and bee-keepers generally, and we do not intend to deal with them here. We have referred above to, and quoted from, another most important treatise on the same subject "The Anatomy of the Honey Bee" by R. E. Snodgrass (Bul. 18, Tech. Series), issued by the U. S. Department of Agriculture. The splendid work that is being performed by the Washington Bureau of Entomology in the interests of bee-keeping is well known, and this production will be accorded a warm and richly deserved welcome. The scope of the bulletin will be gathered from the author's introduction in which he says: "It is hoped that the work will furnish the interested bee-keeper with beter information on the anatomy of the bee than has heretofore been offered to him, that it may provide a foundation for more detailed work in anatomy and histology, and finally that it will be of service to future students of the embryology and physiology of the bee."

Let us say at once that the book will prove of immense service in meeting the popular demand for accurate information on the subject as well as in providing the student with a thoroughly reliable and up-to-date text book. We are particularly pleased to see an attempt made to help the bee-keeper to gain a clear idea of the external structure of insects in general. We say "attempt"; for we recognize how exceedingly difficult it is to condense into a single chapter, that which requires for its adequate treatment a whole volume. We hope, however that this preliminary account may stimulate some to seek assistance upon a much wider field.

The scientific terms necessarily employed in works of this nature will not in this case prove a very great stumbling block to the general reader. Below we print an extract under the heading, "The Antennæ and Their Sense Organs" from which will be gathered an idea of the interesting manner in which the author has succeeded in presenting his subject. Regarding the numerous illustrations with which the text is embellished, we would say that it is evident that the very greatest care as to accuracy has been exercised in their preparation. The five or six full page drawings showing the nervous and tracheal systems, and the alimentary canal and its glands, will be found especially valuable in serving to depict the structure of the bee, and are quite in advance of anything we have yet seen of a similar character.

W. W.

Indexed

The Antennæ and Their Sense Organs.

"The antennæ of the bee are the two slender, jointed appendages movably attached to the centre of the face, where each is inserted into a circular membranous area or socket just above the upper part of the clypeal suture. Each consists of two parts, forming a prominent elbow with each other, and usually so held that the first or proximal part extends outward and upward from its frontal attachment and carries the other in a pendent position from its distal end. The first part thus forms a basal stalk called the "scape," consisting of a single joint inserted into the antennal socket of the front by a prominent basal condyle bent toward the face. This articular knob is attached to the rim of the socket by a circle of membrane, but is also pivoted on a slender peglike process projecting upward from the lower edge of the socket. Hence, while the flexible membrane allows each antenna to revolve freely in any direction, the latter is, at the same time, held firmly in position by the pivot. The antennæ are moved by special sets of muscles inserted upon their bases within the head. The second or distal division of the antenna is cylindrical and longer than the first, forming a flexible flagellum, hanging downward from the distal end of the "scape." It is composed

of 11 small joints i
queen and of 12 in th
antenna thus consists
while that of the fema
first joint of the flagel
ulated to the scape,
not have much play
though they give flex
ellum as a whole.

Each antenna is a h
ing the large antennal
tensions of the trachae
small muscles which n
upon one another.

Popularly the anten
known as the "feelers,"
constantly moved abou
with a nervous kind of
creature were feeling i
means of them. In fa
better name for these
the scientific term, for
doubt that the sense
highly developed in the
means of them insects ac
of information concernin
ings and their compan
a large mass of evidence
periments shows unquest
organs of smell also are
antennæ in a great ma
sects, while some inves
that in some species the
tion the organ of hearing

The study of the sense
most elusive subejct, an
so the more we ponder o
experiments. In the fi
manifestly impossible fo
any real knowledge of a
tions, for what is to us a
a color, or a sound may
quite different to such a d
ized creature. We can, h
periments determine tha
which give us the sensat
are perceived also by inse
near them. Also it can
some of them distinguish
different taste in their foo

as succeeded in pr
Regarding the num
ith which the text is
ld say that it is evi
greatest care as to
xercised in their pre
or six full page draw
nervous and tracheal
mentary canal and its
d especially valuable
the structure of the
in advance of any
een of a similar char

W. W.

Their Sense Organs.

the bee are the two
pendages movably at
re of the face, where
o a circular membran
just above the upper
suture. Each consists
orming a prominent
other, and usu
the first or proximal
ard and upward from
nent and carries the
position from its distal
rt thus forms a basal
"scape," consist
joint inserted into
et of the front by a
ndyle bent toward the
ar knob is attached to
et by a circle of mem
pivoted on a slender
jecting upward from
the socket. Hence,
membrane allows each
freely in any direction,
same time, held firmly
e pivot. The antennæ
cial sets of muscles in
bases within the head.
tal division of the an
l and longer than the
flexible flagellum,
d from the distal
ape." It is composed

of 11 small joints in the worker and queen and of 12 in the drone. The male antenna thus consists of 13 joints in all, while that of the female has but 12. The first joint of the flagellum is freely articulated to the scape, but the others do not have much play upon one another, though they give flexibility to the flagellum as a whole.

Each antenna is a hollow tube containing the large antennal nerve, minute extensions of the trachael system, and the small muscles which move the segments upon one another.

Popularly the antennæ of insects are known as the "feelers," because they are constantly moved about in all directions with a nervous kind of motion as if the creature were feeling its way along by means of them. In fact "feelers" is a better name for these appendages than the scientific term, for there can be no doubt that the sense of touch is very highly developed in them and that by means of them insects acquire a great deal of information concerning their surroundings and their companions. Moreover, a large mass of evidence derived from experiments shows unquestionably that the organs of smell also are located upon the antennæ in a great many if not all insects, while some investigators believe that in some species they carry in addition the organ of hearing.

The study of the senses of insects is a most elusive subejct, and becomes more so the more we ponder on the results of experiments. In the first place, it is manifestly impossible for us to acquire any real knowledge of an insect's sensations, for what is to us an odor, a taste, a color, or a sound may be something quite different to such a differently organized creature. We can, however, by experiments determine that some things which give us the sensation of an odor are perceived also by insects when placed near them. Also it can be shown that some of them distinguish substances of different taste in their food, and likewise that they perceive movement and distinguish colors and in a vague way outlines of objects. Furthermore, it is known that some of their perceptions are more delicate than ours, and that some insects at least see color where we see none. They may even possess senses of which we have no conception.

Hence, while it can be positively stated that insects perceive differences of touch, taste, smell, sound and light, and act accordingly, we can not say what the sensations they acquire are like. In fact, we do not know that they have conscious sensations at all. What looks like an action due to intelligent perception may be purely a reflex one, unaccompanied by any sensation. This of course involves the question as to whether such creatures or insects are possessed of consciousness or not—a question which can not be answered one way or the other.

Understanding then, that our knowledge of insect senses amounts only to this, that what gives us the sensation of light, sound, taste, touch, or smell makes also some sort of an impression on the insect and varies the degree and kind much as it does in us, we may go on to a study of the senses located on the antennæ.

Here, again, however, we are confronted by a difficulty, for while, at first thought, it seems very easy to hold some strong-smelling substance near the antennæ of a beetle, ant, or bee and observe the evident displeasure with which the creature turns away, yet we may be entirely wrong if we conclude that the insect "smells the substance that repels it. Strong-smelling, volatile liquids may simply produce pain in some of the delicate nerve endings of the antennæ. Some other kind of a being, experimenting on our senses, might close up our nose and mouth and prove that we smell by means of our eyes on observing the blinking we perform when strong formalin or ammonia was held close to the face. Furthermore, irritant gases and volatile liquids affect the mucous membranes of our noses and throats in a way

quite independent from the odor that we perceive, and there is no reason why the same may not be true of insects. As pointed out by Forel, experiments on the sense of smell should be made with odorous substances that the insect meets with in a state of nature, which would be principally the materials it feeds on. Insects are indifferent to almost every mildly odorous substance not used as food, which, however, does not prove that they do not smell them.

Again, in many cases, it would be difficult to decide whether the results of an experiment should be accredited to smell or sight. For example every bee-keeper knows that hungry bees are attracted to honey a long distance from their hives, and it would seem almost self-evident that they are guided by a sense of smell. Yet one might contend that they find the honey by sight, as, indeed, is claimed by a number of entomologists who have made experiments on the olfactory powers of bees. This question has been decided in some other insects by painting the eyes with some opaque substance or by removing the antennæ, but the evidence is not conclusive on either side in the case of bees.

Experiments made by a large number of competent investigators including Lubbock, Schiemenz, and Forel, have proved conclusively that the organs of the smell in insects are located principally on the antennæ. The most interesting of these experiments are perhaps those which Forel (1903) made on carrion-feeding beetles. He found the dead and putrid bodies of a hedgehog and a rat infested by a swarm of these beetles belonging to several genera. He collected more than 40 specimens from the carcasses and removed their antennæ. Then he placed them all at one place in the grass and moved the dead bodies to a distance of 28 paces from the beetles where he concealed them in a tangle of weeds. Examination the next day revealed the fact that not one of the mutilated beetles had found the carcasses. Repeated experiments give the same results—no beetle without its antennæ was ever found on the dead animals, although at each examination new individuals of the several species were present. It might be supposed that the mutilation itself distracted the beetles to such an extent that they did not care to eat. In order to test this point Forel next cut off all the feet on one side of the body from a dozen intact beetles and changed the location of the dead bodies again. The next day five of this lot were found on the carcasses.

The same results have been obtained from experiments on other insects. Ants distinguish between their comrades and enemies by means of their antennal sense organs. Males of the silk-worm moth and many other moths and butterflies perceive the presence of the females and are guided to them by the sense of smell located on the antennæ for they fail completely to find them when these appendanges are removed, although one immediately recognizes a female when placed in contact with her.

Similar experiments have been made on the bee, testing the ability of the workers to find honey hidden from their sight, The results, according to Forel, seem, curiously enough, to indicate that bees can perceive odors but a very short distance from their heads. Forel found that hungry bees in a cage would pass and repass hundreds of times within a few millimeters of some honey concealed from their sight by a lattice without discovering it. They ate it greedily, however, when the lattice was removed, though it had been perfectly accessible to them all the time, Forel believes that "bees guide themselves almost exclusively by vision," and Lubbock holds the same opinion. At the same time it would probably be a very difficult matter to convince many practical bee-keepers that bees do not "smell" from long distances. It is a well-known fact that at times when nectar is scarce bees are attracted in large number to the

houses where honey is stored, though when the natural flow is sufficient, they pay no attention to it. Tests of the olfactory sense should undoubtedly be made under natural conditions. Bees enclosed in a box with some honey concealed from their sight might not be able to locate it in such close quarters though they might be smelling it all the time. An odor in a room may so fill the air that it does not seem to come from any particular direction and we ourselves would have to exert our intelligence to discover its source.

While, then, it does not seem probable that bees have such limited olfactory powers as some investigators claim their experiments indicate, it may be accepted as proved that the organs of smell are located principally on the antennæ. It has already been stated that the sense of touch also is very highly developed on these organs, although in a less sensitive degree it is distributed over most of the other parts of the body. It is again specially developed on the palpuslike appendages of the sting. Sections of a bee's antennæ show that there are on its surface a great number of minute structures of several different kinds, though all apparently are to be regarded as modified hairs, which are undoubtedly the sense organs. Now, the question arises of deciding which of these to assign to the sense of touch and which to the sense of smell. Different authors have made such different interpretations of the sense organs of insects that the student attempting to get information on the subject from books must soon get discouraged by their conflicting statements. But it must be realized that only intelligent guessing is possible when several senses are located on the same part. In the case of the bee some authors have ascribed even a third sense, that of hearing, to the antennæ, but there is little evidence that bees possess the power of hearing. The sense of taste and touch are possessed by the mouth parts, and some entomologists think that they contain the organs of smell also. Thus the organs of sight are apparently the only ones that can not be confused with some other sense.

The best account of the antennal sense organs of the bee is that of Schiemenz, 1883, whose text is the basis of the following description. The organs consist, as before stated, of modified hairs and their basal insertions which are connected with the ends of nerve fibers. Some of them stand exposed on the surface of the cuticle while others are sunken into, or entirely concealed within, pits of the integument. In addition to these, there are two other kinds of special hairs on the antennæ which have no nerve connections, while, finally, the ordinary hairs, such as are found on all parts of the body, occur also on them, especially on the scape.

The special hairs not provided with nerve endings are of two sorts. One is a solid curved or hooked hair, which is simply articulated into a socket of the cuticle, while the other is hollow and is situated over a channel through the cuticle, and contains a prolongation of a specially enlarged epithelial cell lying beneath it. These hairs can not be regarded as sensory, since they have no communication with the central nervous system, and it is not clear just what purpose they do serve.

The simplest sensory organ is a short, hollow, conical hair arising directly from the surface of the cuticle, over a wide opening through the latter, and containing the end of a sensory cell connected with a nerve fibre, which goes into the main trunk of the axial antennal nerve. A modified form of this organ consists of a curved hair set into a small depression over the cuticular channel. Such hairs are probably tactile in function; that is to say, by means of them the bee can perceive that its antennæ are in contact with some surface. The general integument is too thick and dense to allow of any sort of delicate touch sensation being communicated through it, but if one of

distributed especially over the outer surface of the antennæ and at its apex, but occur also scattered over the other parts of the body and on the mouth parts.

Microscopic sections of the antennæ reveal still other organs which are not so apparent on the surface as the hairs just described. It consists of a small pit in the integument, widened basally, and having a small papilla on its floor, in whose summit is the opening of a still deeper cavity which also expands towards its deeper end. This inner cavity is almost filled up by a conical plug which arises from its floor and ends just below the aperture into the outer pit. The plug contains a thick nerve ending which these movable hairs brushes against an object the nerve within it must be at once stimulated. Tactile or touch hairs are arises from a ganglion cell connected with the antennal nerve by a nerve fibre. Ten or more of these sense organs occur on the terminal and the first three segments of the flagellum. It is evident that each is simply a sensory hair which has been doubly sunken into a cavity of the integument.

As before stated it has been conclusively proved by several investigators that bees perceive odors and it is said that if the antennæ are covered with shellac, bees can distinguish between distasteful substances only by means of proboscis. Schiemenz and most other writers on the subject therefore conclude that the sunken cones are the organs of smell, since, being below the surface, they could not be organs of touch. Some other authors, among whom are Cheshire, regard these inclosed cones as hearing organs. They suppose that the sound waves of the air enter the pit, as into an ear cavity, and these set up a vibration in the cone which stimulates the attached nerve endings. However, the appearance of one of these cones would suggest that it is too stable a structure to be affected by sound waves, so the olfactory theory seems much more probable.

The following, then, may be stated as a general summary of the evidence concerning the antennal senses and their sense organs in the bee: (1) The antennæ are highly sensitive to touch and are the seat of the sense of smell. (2) They are covered by several kinds of minute structures which are modified hairs containing special nerve-endings. (3) By inference, it would seem certain that these are the sense organs, but we can only form an opinion, based upon their structure, as to which are tactile and which olfactory. (4) One set of organs does not appear to belong to either of these categories and their structure suggests an auditory function, but, in the absence of evidence that bees hear, the purpose of these organs must be regarded as problematical.

HONEY CROP REPORT.

September 9, 1910.

The Honey Crop Committee met again yesterday (Sept. 8th), to consider crop reports and prices for dark honey. After carefully examining the many reports sent in, the committee conclude that the crop is slightly less than 1909, and believe that prices ought to remain firm in sympathy with the prices for light honey, fruit and other produce. The following prices are recommended, and have already been realized for large quantities:

In lots of one ton and over to wholesale grocers or commission houses, 6¼c. to 7c.

In smaller quantities to the retail trade 7¼c. to 8c.

Retail direct to consumer, 9c. to 10c.

In answer to our inquiry re prices realized for light honey, 95% report that the recommended prices have been obtained, 3% state that prices have been from 9c. to 10c., and only 2% have sold for less than 9c.

William Couse
H. G. Sibbald
Morley Pettit
P. W. Hodgetts

n, may be stated as
of the evidence con-
l senses and their
ee: (1) The antennæ
to touch and are the
smell. (2) They are
inds of minute struc-
lified hairs containing
s. (3) By inference,
in that these are the
ve can only form an
their structure, as to
d which olfactory. (4)
oes not appear to be-
se categories and their
n auditory function,
of evidence that bees
these organs must be
atical.

OP REPORT.

September 9, 1910.

Committee met again
h), to consider crop re-
or dark honey. After
ig the many reports
ittee conclude that the
than 1909, and believe
to remain firm in sym-
rices for light honey,
roduce. The following
nded, and have already
arge quantities:
n and over to wholesale
sion houses, 6¼c. to 7c.
tities to the retail trade

consumer, 9c. to 10c.
r inquiry re prices real-
ey, 95% report that the
es have been obtained,
es have been from 9c. to
have sold for less than

William Couse
H. G. Sibbald
Morley Pettit
P. W. Hodgetts

Want and Exchange Column

Any quantity of No. 1 clover honey will be taken in exchange for 5 and 10-lb. pails, same as I use. Will contract now for your next season's crop.

G. A. DEADMAN.

National Bee-Keepers' Association

(Organized in 1870.)

Objects.

1. To promote the interests of bee-keepers.
2. To protect and defend its members in their lawful rights as to keeping bees.
3. To enforce laws against the adulteration of honey.

Membership Dues.

One dollar a year.

Officers and Executive Committee.

President—GEORGE W. YORK, Chicago, Ill.
Vice-President—W. D. WRIGHT, Altamont, N. Y.
Secretary—LOUIS H. SCHOLL, New Braunfels, Tex.
Treas. & Gen. Mgr.—N. E. FRANCE, Platteville, Wis.

Twelve Directors.

G. M. Doolittle, Borodino, N. Y.
Jas. A. Stone, Rt. 4, Springfield, Ill.
R. A. Holekamp, 4263 Va. Ave., St. Louis, Mo.
Wm. McEvoy, Woodburn, Ont., Canada.
M. H. Mendleson, Ventura, Calif.
R. C. Aikin, Loveland, Colo.
R. L. Taylor, Lapeer, Mich.
E. D. Townsend, Remus, Mich.
Udo Toepperwein, San Antonio, Tex.
J. E. Crane, Middlebury, Vt.
E. F. Atwater, Meridian, Idaho.
R. A. Morgan, Vermilion, S. Dak.

Are YOU a member? If not, why not send the annual dues of $1.00 *at once* to Treas. France, or to the office of the American Bee Journal, 146 W. Superior St., Chicago, Ill.? It will be forwarded promptly to the Treasurer, and a receipt mailed to you by him. It is the desire of the officers to increase the membership to 5000 by the end of 1910. Every progressive bee-keeper should be a member of this, the greatest bee-keepers' organization in America.

R E E

A

iamond

Point

)UNTAIN PEN

e as a Premium

hing is more ac-
able as a gift at
season than a
d Fountain Pen.
above illustrates
en that is fully
ranteed to us and
we can therefore
rant to give satis-
ion to any one re-
ing it from us.
are giving it free
ll new subscribers
he Canadian Bee
rnal who remit us
35 for one year;
to all old sub-
bers who send us
vo year renewal for
oo in advance.

ian Bee Journal

ORD, CANADA