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VOL. IV, NO. 44

1889

JANUARY 23

PUBLISHED EXCLUSIVELY IN THE INTERESTS OF THE HONEY PRODUCER

THE CANADIAN



JOURNAL

THE FIRST \$ WEEKLY IN THE WORLD

ONE DOLLAR PER YEAR

THE GREATEST POSSIBLE GOOD TO THE GREATEST POSSIBLE NUMBER

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BEETON ONT.

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We can supply Binders for the JOURNAL 55 cents each, post paid, with name printed on the back in Gold letters.

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TO CONTRIBUTORS

Communications on any subject of interest to the Bee-keeping fraternity are always welcome, and are solicited.

Beginners will find our Query Department of much value. All questions will be answered by thorough practical men. Questions solicited.

When sending in anything intended for the JOURNAL do not mix it up with a business communication. Use different sheets of paper. Both may, however be enclosed in the same envelope.

Reports from subscribers are always welcome. They assist greatly in making the JOURNAL interesting. If any particular system of management has contributed to your success, and you are willing that your neighbors should know it, tell them through the medium of the JOURNAL

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Nickel plated pen and pencil stamp with name on. Nickel plated stamp with name, 30c. Black wax seal handle with name on, 15c. Your name in rubber or any of the above sent post paid on receipt of price. Clubs amounting to \$1.20 sent for \$1. Boys and girls can make money canvassing for these stamps. Every school boy and girl should have a pen and pencil stamp. It contains a pen, lead pencil and stamp for printing your name on your books, etc. Write your name plainly. Remember you have no duty to pay on these stamps when you deal with us.

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MALAKOFF, ONT.

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Unapproached for
Tone and Quality.

CATALOGUES FREE.

BELL & CO., Guelph, Ont.

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THE BEE KEEPERS' REVIEW for December has four extra pages — twenty in all. Upon the first page is a brief history of the REVIEW; also an excellent

PORTRAIT OF ITS EDITOR,

One of these beautiful lives reproductions. The special topic of this issue is: "Sections and their adjustment on the Hives" and it is handled by such men as Jas. Heddon, Dr. C. C. Miller, R. L. Taylor, Oliver Foster and Dr. G. S. Tinker. A copy of this issue will be cheerfully sent free to all who apply.

Price of the REVIEW 50 cts. a year.

The Production Of Comb Honey !

Although this neat little book contains only 45 pages, it furnishes as much practical, valuable information as is often found in a book of twice its size. It is 'boiled down.'

It begins with taking the bees from the cellar and goes over the ground briefly, clearly and concisely, until the honey is off the hives; touching upon the most important points, and especially does it teach when, where and how foundation can be used to the best advantage; when combs are preferable and when it is more profitable to allow the bees to build their own combs.

Price of the book 25 cents.

SPECIAL OFFERS.

For 65 cts. we will send the REVIEW one year and "The Production of Comb Honey." For \$1 we will send all the numbers of the REVIEW for the past year (1888), the REVIEW for this year (1889) and the "Production of Comb Honey," or, for the same amount (\$1), we will send the REVIEW for two years from Jan. 1st, 1889, and "The Production of Comb Honey." Stamps taken, either U.S. or Canadian.

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L. P. THURSTON & CO
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Perfection Cold Blast Smokers, Square Glass Honey Jars, etc. Send ten cents for "Practical Hints to Beekeepers." For circulars apply

CHAS. F. MUTH & SON.

Cor., Freeman & Central Avenues, Cincinnati

\$1.00 Will secure you by mail, post paid, 250 Noteheads and 250 Envelopes with your name, business and address printed on the corner of each. Send in your order now. **THE D. A. JONES CO., Beeton, Ont.**

BEE SUPPLIES.

Until March 1st, Brood frames \$1 per 100, \$9 per 1000. Section Crates, Feeders, etc., correspondingly low. Send for price List to

W. A. CHRYSLER, Chatham, Ont., (Box 450).

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We make a specialty of Apiarian Printing, and have unequalled facilities for Illustrated

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Note Heads, good quality.....	500	1000
“ “ linen.....	\$1 15	\$1 90
Letter Heads, Superfine.....	1 25	2 00
“ “ Linen.....	1 75	2 50
Envelopes, business size, No. 7,	2 00	3 25
white.....	1 15	2 00
Extra quality.....	1 35	2 25
Business Cards.....	1 50	2 50
Shipping Tags, 40c., 45c. and 50c. per 100.		

Our new book of labels contains nearly 100 specimens of elegant honey labels. Write for prices for any printing required.

THE CANADIAN BEE JOURNAL,

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BEEETON.

EXCHANGE AND MART.

Advertisements for this Department will be inserted at the uniform rate of **25 CENTS** each insertion---not to exceed five lines---and 5 cents each additional line each insertion. If you desire your advt. in this column, be particular to mention the fact, else they will be inserted in our regular advertising columns. This column is specially intended for those who have bees or other goods for exchange for something else, and for the purpose of advertising bees, honey, etc. for sale. Cash must accompany advt.

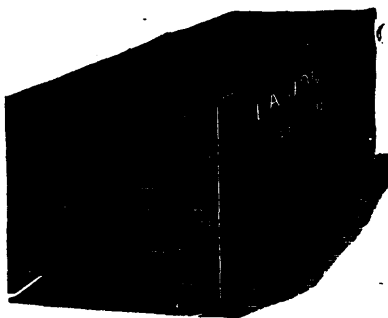
FOR Sale—1 Barnes foot power circular saw, as good as new; price \$40. Also 4 honey tanks, hold 550 lbs each \$2.50 each. Edward Lunau, Buttonville, Ont.

HONEY.—We can take all that offers in exchange for supplies, at prices found in another advertisement in this issue. THE D. A. JONES CO., Beeton, Ont.

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FOR PRICES SEE OUR CATALOGUE,
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TO ANY ADDRESS.

THE D. A. JONES CO., LD.

BEEETON, ONT.

THE AMERICAN APICULTURIST

Will be mailed from Oct. 1 1888 to Jan 1 1890 for 75 cts. The editor has had 30 years experience in rearing Queens and practical Bee-keeping, and now proposes to give the result of that long experience in a series of articles in the APICULTURIST. The first Article will appear in the Nov. 1888 issue. The details of a new method of rearing Queens in full colonies, without making the colony queenless, will be given to each subscriber. Send for sample copy Address
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J. M. CLARK & CO., 1409 15th St., Denver, Col.
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and numbers of other dealers. Write for SAMPLES FREE and Price List of Bee Supplies. We guarantee every inch of our Foundation equal to sample in every respect. Everyone who buys it is pleased with it.

CHAS. DADANT & SON,
HAMILTON, Hancock Co., Ill.



"THE GREATEST POSSIBLE GOOD TO THE GREATEST POSSIBLE NUMBER."

VOL. IV. No. 44

BEETON, ONT., JAN. 23, 1889.

WHOLE No. 200

EDITORIAL.

SEVERAL of the bee journals have been or are publishing articles on bee hives, and our paper on Practical bee-keeping this week is on the same subject.

* *

In last *Gleanings* friend Root calls attention to a mis-statement on our part in the paper on *Idn.* We spoke of a girl in his employ putting foundation in 1,200 sections an hour. We wrote from memory and did not have the article in sight, which refers to folding sections, and not to putting in *Idn.* While the foot-power *Idn.* fastening machines work more rapidly, Mr. Root finds that the Parker does rather better work.

* *

Just as we go to press we learn with deep regret that Mr. Wm. Raitt, one of the editors of the *Bee-Keepers' Record*, died suddenly at his residence, Becroft, Blairgowrie, Scotland, on January 8th. We are pained at the intelligence and extend sympathy to those bereaved.

* *

Michigan has done honor to one of the best apicultural writers of to-day in electing to the State Senate Hon. R. L. Taylor, of Lapeer.

* * *

Mr. George Watson, bee-keeper, of Alliston, succumbed to congestion of

the lungs last week. He was a young man of only 29. To our readers he will be known as the one to whom the Daniel McFadden letters are alleged to have been sent.

Read at the O. B. K. A.

The Ventilation of Hives in Winter.

AIR which has been breathed is changed in the following particulars

1. Whatever the temperature of the external air is, that which has just been breathed is nearly as hot as the blood.
2. However dry the external air may be that which has just been breathed is quite or nearly saturated with watery vapor.
3. Air which has just been breathed has its carbonic acid increased by more than one hundred times, and it has its oxygen decreased by about one-third. It has added to it animal organic matter of a very injurious nature.

We so often hear and read of the impurities of breathed air that it has become an old story. A few simple experiments will perhaps assist in fixing in the mind, some of the changes which take place in its composition.

If we breathe upon a looking-glass at the ordinary temperature, we shall see the vapor of our breath condensed on its surface. In very severe weather the vapor of the breath of the bees is frozen into hoar-frost on the inner walls of the hives, and on a cool spring morning we often see the condensed vapor of their breath trickling down the alighting board.

I have here a gem jar, holding about three pints, and having a mouth about 2½ inches in

diameter. I let this piece of lighted candle down to the bottom of the jar, and you see it continues to burn as briskly as ever. I now breathe through a tube into the jar, delivering the breath near the bottom, so as to not blow out the flame. You see the flame soon becomes dim and goes out. Flame dies out when the proportion of oxygen is reduced to 18½ parts in every 100 parts of air, instead of 21 parts, the normal quantity.

In this bottle I have lime water which you see is quite clear. I now blow air from the lungs through the lime water by means of a tube, and you notice the water becomes milky in appearance. The milkiness shows that the carbonic acid of the breath has united with the lime in the water, forming chalk, and the formation of so much chalk shows that the carbonic acid must have been present in excessive quantity; because had I blown air into the limewater from a bee-smoker, no perceptible change would have taken place.

But it may be said that these experiments have been made with the human breath. Have we any evidence that the breath of bees is so impure that it is injurious to bee-life? The maximum amount of impurity admissible in an apartment occupied by people is 6 parts in 10,000 parts of air. Mr. Cheshire has ascertained that for bees not more than 5 parts of impurity in 10,000 are admissible, and to keep the air in this state of purity, he finds that all the air in the hive must be changed every half hour, assuming the bees to be so dormant that they consume less than one pound of stores per month, and that the air contained in the hive does not exceed half a cubic foot. Mr. Cheshire's statements might be confirmed by those of other authorities and by facts observed by practical bee-keepers. As our time is limited I shall not discuss any further the necessity for hive ventilation, but shall proceed at once to consider the means by which it may be best accomplished.

We have already seen that a lighted candle will continue to burn in the jar when its mouth is open full size. I now insert a perforated cork so as to reduce the opening to a diameter of about one inch, and again introduce the lighted candle, the jar being in an inclined position; but you see the flame soon dies out. After emptying the jar I again introduce the lighted candle, and at the same time I insert a piece of cardboard into the mouth of the jar, dividing the opening horizontally. You see as a result, that instead of going out, the candle continues to burn. I remove the cardboard, and at once the flame becomes sickly; I insert it again and it brightens up, and these changes can be repeated as often as I choose to take out and put in

the cardboard. If while the cardboard is in place, I cause a little smoke to rise close to the lower edge of the opening you will see that it is drawn into the jar by an ingoing current of air. By holding the hand above the cardboard the warm outgoing current is distinctly felt.

A friend informs me that in one of the mining districts a horizontal tunnel was run into a mountain side. After going some distance the air became so warm and foul that work had to be suspended. A trench one foot deep and one foot wide was cut in the bottom of the tunnel, and was covered with plank. A current of fresh air set in through this channel and drove out the warm impure air from the tunnel.

A difference in the temperature of two bodies causes a difference in their density, and a difference of density causes currents, if the bodies of air are free to change places, just as certainly as oil rises to the surface of water. How is it then that currents did not take place in the tunnel until the channel was made in its bottom? The reason seems to be that the friction between the ingoing and outgoing currents counteracted their force, and there was no ventilation except by slow diffusion; but when the covered passage was made at the bottom, the retarding effect of one current on the other was removed and ventilation took place. In the case of the jar the piece of cardboard separated the currents and ventilation took place there also. I shall show presently that hives fail to be well ventilated, for the same reason, when there is only a single entrance and that a narrow horizontal one at the bottom.

We have now learnt something about air which has been breathed. We have learnt that a candle will not continue to burn in a jar unless a constant supply of fresh air is kept up; we have learnt that two currents of air going in opposite directions, will not readily pass each other through a small opening, and we have learnt that they may be made to pass each other by inserting a partition to keep the currents from interfering with each other.

I have here an eight frame Langstroth hive, covered by a solid board, and having a rim two inches deep. The top, body, rim and bottom board are all clamped together with Vandusen clamps, all the joints being made air tight with rubber packing. You see the entrance was originally the full length of the front of the hive and half an inch deep; but for the purposes of these experiments I have reduced it to four inches in length. This we shall call entrance No. 1. I have a similar entrance directly below it, cut out of the lower edge of the rim. This is entrance No. 2. I have another of the same

size cut out of the lower edge of the back of the rim. This is No. 3; and I have an opening No. 4, running vertically from the middle of No. 1; the size is three inches by five eighths. You observe I keep these numerous entrances closed by slides when not in use. I now suspend in the hive a two quart tin pail of hot water, the pail being coated with blacking on the outside to make the heat radiate more readily. To make the currents of air from the hive easily seen I shall mix the air in the hive with smoke. I open entrances No. 1 and 3, and you see quite a volume of smoke escaping from No. 1; I close No. 3 and open No. 2, and the volume of smoke continues to come from No. 1. By means of a strip of smoking cotton velvet it can be shown that a strong current of air sets into the hive through No. 2. After a little I again close No. 2 and open No. 3, and we still get a dense smoke from No. 1; I suddenly close No. 3, and No. 1 ceases to act, open it again and away goes the smoke. This is like the case of the candle going out in the jar with the reduced opening. No. 3 being still closed I insert a piece of tin into No. 1, dividing it horizontally, just as we inserted the cardboard into the mouth of the jar, and just as occurred in that case, the current sets outwards above the partition and inwards below it. This is more clearly shown when I open the vertical opening No. 4, all the other openings being closed. You now see the smoke pouring out of the upper part of No. 4, while at the same time a strong current is rushing in at the lower part. This is plainly seen when we test the current with the smoking velvet. Open No. 3 and the whole of No. 4 is filled with outgoing smoke; close it again and at once the outgoing smoke is confined to the upper part of the opening.

In ventilating buildings it is found, that in order to get a quantity of air into an apartment, it is necessary to get an equal quantity out, and vice versa. Our experiments teach us that the same rule holds good in regard to the ventilation of hives.

If we had a covered passage from No. 2 to near the back of the hive, like the trench in the tunnel, the air thus introduced would sweep the hive from back to front on its way to the place of exit at No. 1.

But the same object is much more easily obtained by keeping No. 3 open.

I assume that no argument is necessary to show the advantage of having a rim to raise the combs above the bottom board. If it is placed between the hive and the bottom board, the Vaudsen clamps do away with the objection to loose bottom-boards, and the cost per hive is less than six cents. Having a rim we learn from

these experiments that good lower ventilation is most easily obtained by leaving the ordinary fly-hole open above the rim, while at the same time we have an opening in the lower edge of the rim at the back of the hive.

The greatest obstacle to free ventilation of hives by a single opening is the friction of the currents around the edges of the opening, and the friction between the outgoing and the incoming currents. In our experiments we have seen that the friction between the currents themselves is much greater than it is between the currents and a partition separating them.

Since the currents are retarded in proportion to the length of the lines by which they are bounded, the best form for a single opening is that which has the shortest border for a given area, and at the same time the shortest horizontal section, because, as we have seen, the friction between the currents is along a horizontal line. A horizontal fly hole the full width of a Langstrath hive, say 12 inches long and half an inch deep gives an opening six square inches in area with a border 25 inches in length and a line of friction between the currents 12 inches long. A square opening of the same capacity has less than $2\frac{1}{2}$ inches for friction between the currents. A circular opening of the same area has less than $8\frac{1}{2}$ inches for friction about its circumference, and about $2\frac{1}{2}$ inches for friction between the currents, and a vertical opening of the same capacity, say 6 inches high and one inch wide, has 14 inches for border friction, and only one inch for friction between the currents, on account of its height and the small amount of friction between the currents. This form of opening is more efficient for ventilation than any of the others. Leaving dead bees and the debris of the hive entirely out of question, the worst possible form of single opening for lower ventilation is the one which is most convenient as an entrance for the bees, viz: A narrow horizontal entrance at the level of the bottom board. Some of the most intelligent and observing bee-keepers have found this to be the case, and are now making their entrances deeper. A few years ago Dr. Tinker made his entrances half an inch deep, the hives being sealed at the top. Now he finds that to secure the best results in outside wintering, he must have the entrance $1\frac{1}{4}$ inches deep by $8\frac{1}{8}$ inches long.

But all are not agreed that it is the best way to have hives hermetically sealed at the top and ventilated below only. Probably a large majority of bee-keepers either favor direct upward ventilation, that is air admitted at the entrance and passed out at an opening for the purpose somewhere in the top, or more slowly passed off through what are often improperly called absorb-

ents. Many favor the latter because they believe the foul air is in this way carried off while the heat is retained. I have not made any experiments to find out how fast air passes through cushions and quilts, but I fear the impurities may not be carried off as fast as they are produced, and think it safer to combine with the ventilation through top packing the lower ventilation already described. I have ascertained beyond any doubt that a solid board on top of a hive will conduct away the heat of the bees faster than will a quilt containing say a pound and a half of wool.

The theoretical objection usually urged against direct upward ventilation is that the warm air is carried off too rapidly, and in consequence the bees suffer. But many of the most experienced bee-keepers have obtained the very best results by slipping the honey boards forward a quarter of an inch, or by raising them one eighth of an inch, when placing this hive in the cellar. In such cases the air enters through the flyhole and escapes through these small openings at the top. I am personally acquainted with a clergyman, an old Lindsay boy, who uses direct upward ventilation, and has not lost a stock in wintering for the last seven years, he has now 66 stocks in the cellar, last year he had 55, the year before 46, and 36 the year previous. He regulates the size of the entrance according to the strength of the stock, an important matter in any system, but generally his entrances are reduced so as to be equal in area to one square inch. His hives are of the Richardson pattern, having hollow walls rising 3 inches above the brood nest. In his honey boards there is a one and a quarter inch feed hole covered with wire cloth. I have here a piece of tin having the edges bent at right angles one eighth of an inch high, forming three sides of a rectangular tube, one and a quarter inches wide, by one eighth deep. Three inches from one end the edges are notched and at this point you see the tube is bent at a right angle. He places this tin, with its open side down, over the feed hole, and covers up the whole top with the sawdust cushion. The three inches of the tube bent at right angles fits snugly against the wall of the hive, forming a continuous air passage from the feed hole to the outer air. The area of this passage is only a trifle over three eighths of a square inch, but, when we consider the probable speed of the current, started as it is from the feed hole directly over the cluster, the tube is probably large enough. I now place the tube in position and you see the smoke issuing from it pretty freely. I close the inlet at the bottom and you see the current is stopped even at the top of the hive. I open

the inlet again and test with the smoking velvet, and you see the smoke is drawn in with the incoming current. This method has been so satisfactory with him and agrees in principle with methods so successfully practised by others that I feel no hesitation in saying bees may be safely wintered by admitting air through a small entrance and allowing it to escape through a small outlet at the top.

I have here a straw hive in which I place the hot water and roll of burning cotton as I did in the Langstroth, you see the smoke comes out all over. There is ventilation here in all directions except through the bottom board. If this is such a "sieve of a hive" is it not probable that the bees would suffer from cold? I made three separate tests to determine this question, starting with equal weights of hot water in the straw hive and in this Langstroth hive. I found in each case that the water in the Langstroth hive cooled quicker, although the extent of cooling surface and cubic capacity of the straw hive is much greater.

In these experiments I have presented ocular evidence as to the way in which changes of air take place when hives are well ventilated, and I have shown the causes which prevent a free interchange of air when they are badly ventilated. I trust that there may be enough of novelty in this method of treatment to arouse interest in the question, and that the facts brought out may furnish food for thought, and lead to further investigations resulting in something more being added to the general store of information relating to the wintering problem..

S. CORNELL.

January 7th, 1889.

SPECIAL BOOK NOTICE.

We have a number of books which have been superseded by more recent editions, which we will sell at very low prices. In some instances they may be a trifle worn or abraded. We have:

	REGULAR PRICE.	OUR PRICE.
1 British Bee-keepers' Guide Book, T. W. Cowan, edition 1886—good as new.....	50	35
1 Bee-keepers' Guide, Prof. A. J. Cook, edition 1882.....	1 25	50
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1 A.B.C., A. I. Root, edition 1886.....	1 25	75
First come, first served. Now, don't all speak at once.		

PRACTICAL BEE-KEEPING.

BY D. A. JONES.

PAPER V.

HIVES.

LOG GUMS.

OUR forefathers on this continent kept their bees in "log gums"—pieces of hollow logs set on end.

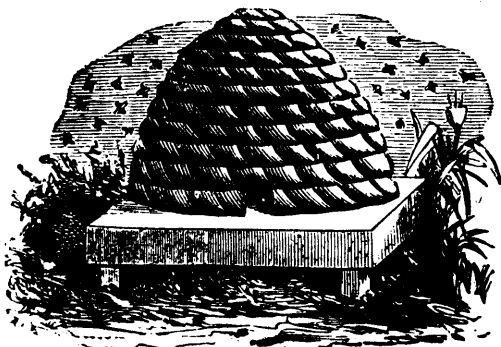
When in the process of clearing the land of its forest growth the hardy pioneer came across a bee tree, the portion of the trunk occupied by the honey gatherers was located, carefully sawn off and taken home. Swarms were placed in similar primitive hives, for these log gums were the original Canadian hives.

The conical straw hive used by our Saxon ancestors and commonly used as an illustration emblematic of industry,

English cottage bee-keeper uses a straw hive with a flat top, having a four-inch hole in the centre for feeding. These straw hives or "skeps" are largely used on the European continent, and the inventive supply-men have so arranged them that supering arrangements can be used on them to take the modern moveable frames and sections.

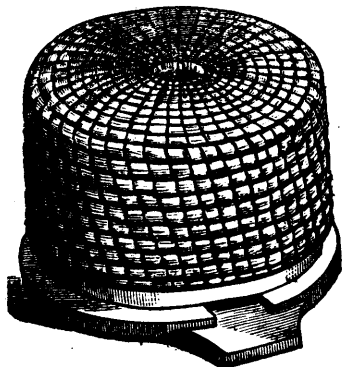
Dr. Dzierzon recommends straw hives "on account of the heat-retaining properties of their material," and Mr. A. Neighbour "for their wintering qualities and equable temperature the year round."

Square straw hives to take the ordinary Langstroth frame are now made in Canada by Mr. S. Corneil, of Lindsay,



OLD-FASHIONED STRAW HIVE

has many votaries to-day, but it has been greatly improved upon. The

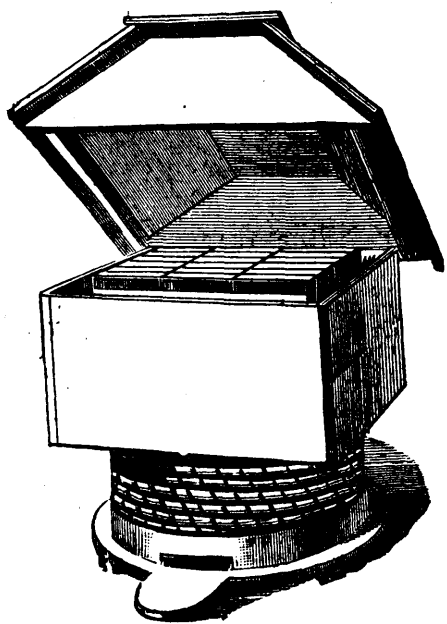


FLAT TOP STRAW SKEP.

who thinks and speaks very highly of them. At the late bee-keepers' convention, Mr. C. showed by conclusive experiments that while they were usually called "a sieve of a hive," yet their heat-retaining qualities were ahead of the regular all-wood hive. Charles Mitchell, of Moiesworth, also speaks very favorably of them.

It is not my intention to give a history of the origin of the movable frames. Others have covered the ground and covered it well and thoroughly. With them, however, the bee-keeper can thoroughly examine and control his colonies, can regulate increase and make artificial swarms, can ascertain the needs of any colony and supply them, making them work for his profit. The

movable frame has revolutionized bee-keeping, and though numerous farmers



STRAW HIVE WITH SUPER.

in the back districts still use the plain box hives, they have had their day.

ONE SIZE HIVES.

I have said in a former paper that I do not recommend the use of varied sizes in hives, and though our friend Pringle does not agree with me in this particular, yet I feel that in justice to the average bee-keeper I cannot recede from my position, unless one has a large enough number of colonies to permit of a free interchange of frames of each size. Mr. Samuel Cushman, in advising beginners to start aright, says:—"The bee-keeper is wise whose apiary contains but one style of hive and that a good one, where there are no odd hives or section crates, no frames too large or too small, where every frame from every hive will fit in any other and there are no misfits or mismates on the premises. In this way there is little trouble and no tinkering and make-shifts. The mechanical manipulation of one hive is just like another or fifty more. There is simply the proper adjustment of parts according to the strength and needs of the various colonies. But many who

have all kinds and sizes are continually discarding one hive for another, buying bees in still another style and worst of all inventing a hive themselves, which will also be discarded as they learn more and get a full understanding of the subject."

I object to patents on bee hives, and am pleased to say that the simplest and most practical hives of the present day are unpatented, so that anyone is at liberty to make for himself almost any hive which takes his fancy and suits his ideas of practicability.

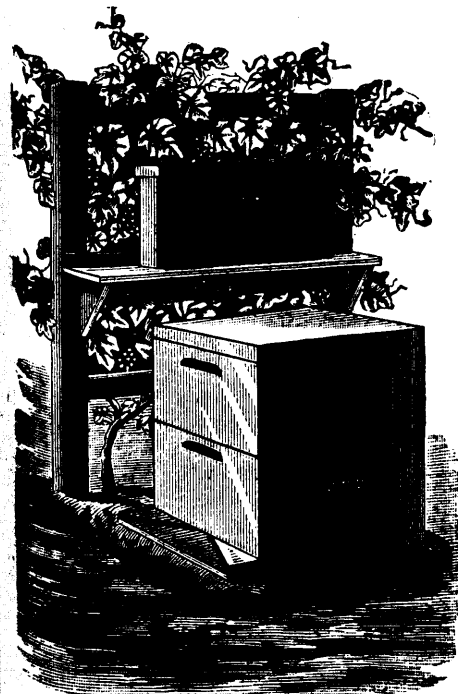
That all who read these papers may understand that I give free choice of hives I will describe all those in common use in Canada, and will then give my preference and the reasons therefor. American bee-keepers use hives with as many names as the days of the year, but in reality there is not much difference except in variation of size of brood chambers. The best hive is simple in construction, easy to manipulate, and adapted to the climate. The shape of the outer box or body differs merely with the shape of the frames used, and these must be adapted to the interest of both the bees and their owner. A practical hive should be large enough for a normal colony and be capable of being enlarged to any needed capacity by addition of top storeys or supers.

R. L. Taylor, in speaking of hives, says:—"No more important question can be put, touching the subject, than how should a hive be constructed so as to reduce to a minimum the amount of labor necessary to carry on an apiary, and in this connection it will be profitable to bear in mind the particular character of the work necessary for that purpose. There is the handling of the hives, both those containing bees and those prepared for the reception of bees; the adjustment and removal of sections; the contraction and expansion of the brood chamber to meet the requirements of the colony at the different seasons of the year; the adjustment of the different parts of the hive to each other; the hiving of swarms; the removal of bees and honey from hives; the finding of queens, and the internal examinations needed to determine the condition of the colony, to remove queen cells, etc." Add to this a hive so arranged as to admit of successful wintering, and you

have most of the qualities which are requisite for the "perfect hive."

THE LANGSTROTH HIVE.

The first hive I shall mention is the one which bears the name of the father of modern bee-keeping—the Rev. L. L. Langstroth. This hive is made in as many and varied styles as there are different kinds of washing machines, but the frames vary but little from the original size. The inside measurement of the one generally used in Canada is $17\frac{1}{8}$ inches wide, by $8\frac{1}{2}$ inches deep inside measure, and $17\frac{3}{8}$ by $9\frac{1}{8}$ outside. This is also the size of frame used by A. I. Root in his Simplicity, or Langstroth hive, which is shown here.



LANGSTROTH OR SIMPLICITY HIVE—
TWO STORIES.

The hive, as made in Canada, is somewhat different in appearance from the one shown in the engraving, and to save misunderstandings I shall describe all hives just as we make them here at Becton.

LANGSTROTH BROOD CHAMBER.

The body of the hive is made up of nine pieces, viz:—Two sides, three-

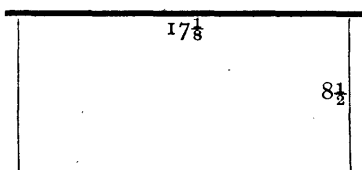
quarters of an inch thick, nineteen and a quarter inches long, and nine and eleven sixteenth inches deep; two ends, seven-eighth inches thick, thirteen inches long, and nine and eleven-sixteenth inches deep; one bottom board, seven-eighth inch thick, twenty-one and a half inches long, and thirteen inches wide; one cleat for front of bottom board, seven-eighth inch square, and thirteen inches long; one cover, five-eighth inches thick, twenty inches long, and fourteen and three-eighth inches wide; two cleats for ends of cover, one inch thick, one and five-eighths wide, and fourteen and three-eighth inches long.

The two sides are cut perfectly plain. The front and back ends are rabbeted at both edges, three-quarter inch wide by half an inch deep, and the top edge of each is also rabbeted seven-eighths inch deep by half an inch wide, and in this a sawcut three-eighths inch deep is made. The sawcut is made one-eighth inch back from the outer edge of the rabbet, and is cut at such an angle as will bring the top edge of a piece of sheet iron five-eighths wide, when inserted in the sawcut, exactly in the same plane as the inner edge of the hive. On these sheet iron strips the frames are supported. The entrance (usually three-eighths by eight inches) is cut in the bottom of the front end. The body is nailed together with three inch nails (I prefer wire nails No. 14 guage). On to this the bottom is nailed, and on the front edge of the bottom board the cleat before mentioned is nailed, to prevent it from warping. The cleats for the ends of the cover are rabbeted out at the sides three-eighths inch deep, the width of the cover and the full length of the cleat. These fit on the ends of the cover, and they are held firmly in position by two or three nails driven through them into the ends. It is now somewhat difficult to obtain lumber sufficiently wide, excepting at a high price, to enable one to make the top or bottom all-in-one-piece. A method of tonguing, by means of sawcuts, three-eighths inch deep in the edges, using heavy tin, three-quarters inch wide, and the proper length, as a tongue, we have found very convenient, and rain proof. The inside measurement of the hive is eleven and a half inches wide; nineteen and a quarter inches long and nine and one

sixth inches deep; the number of cubic inches in which is 2152. Between the bottom of the frames and the floor or bottom board is left a bee space (three-eighths inch) while above the frame a half bee-space only is left. The full bee space is also left between the sides of the frame and the sides of the hive, and the frames must so hang in the hive.

LANGSTROTH FRAMES.

Here then is the brood chamber minus the frames and entrance blocks. Of the former there are eight of the dimensions outside and inside given before, and shown in outline drawing herewith:



The top bar is seven-eighths inch wide, nineteen and one-eighth inches long and three-eighths inch deep, and it is mortised out on both sides one quarter inch wide and one-eighth inch deep, and three-quarter inches from both ends. The side bars are seven-eighth inches wide, nine and one-eighths inch long and one quarter inch thick. Out of the top of each is rabbeted a piece one-half wide and three-eighths deep; these thus form a dovetail with the top-bar and when slipped into position, and a fine three-quarter inch wire nail driven through the dove-tail, they are very strong. The bottoms of the side bars are dove-tailed and the bottom bar is seven-eighths wide, seventeen and five-eighths long and a quarter inch thick. This is dovetailed to match the side bars. In the top bar, we usually run a sawcut, into which when sprung apart, the foundation is slipped. Two or three fine wire nails driven through the whole top bar, will thus bind and secure the foundation firmly in its place.

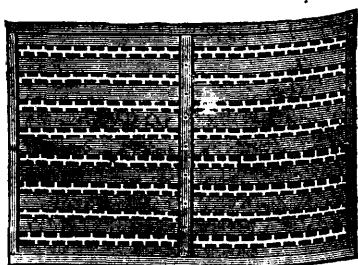
I have now given the brood-chamber of the Langstroth hive in detail.

SECOND STORY.

The second story (used for extracted honey principally) is of exactly the same size, containing the same number of frames, but minus the bottom board, cover and entrance blocks. The little piece of wood which comes out of the

entrance in not cut all the way out, and a tack or two in this holds it in position firmly and closes the entrance. The second story is usually sent out in this way, so that should the apiarist at any time want to use the second story as a brood-chamber, he will only need to get the bottom board, cover and entrance block, the entrance itself being made by the removal of the strip referred to.

Between the top of the frames in the brood chamber and the bottom of the frames in the second story, when the latter is placed in position over the former, there will be a pretty full bee-space, but this is made exact by the introduc-



PERFORATED METAL HONEY-BOARD.

tion of the Perforated metal honey board, which is now coming into such general use throughout the whole of America.

LANGSTROTH SUPERS.

Supers are made to suit this hive, so that comb honey may be taken, by the use of wide frames and separators, rests or skeleton crates, all of which are in common use. The depth of the super varies according to which of the methods is practised, but of these I will treat when the chapter on "comb honey" claims attention.

TEN FRAME LANGSTROTH HIVES.

Just here it may be well to mention that up till recently ten frame Langstroth hives were in use very largely, but latterly these are being discarded and the eight-frame hive is taking its place. One principal reason for this is that the other hives which are in such common use in Canada are of a width narrower than the ten-frame Langstroth, and the whole of them are now so arranged that the surplus or super arrangements are pretty much interchangeable. All those of the last year or so have been made with this in view.

THE FLORA OF MANITOBA.

EVER since the birth of the C. B. J., I have been going to write to it. I wanted to tell you something about the country and how we do things out here, which, I have no doubt, would be most instructive. This "write" feeling kept on growing (and everything grows very rapidly here) until it threw out several branches, leaving several things to write to you about.

But I do recollect, now, writing "Can Bees swarm?" This was done merely to settle for all time the fact that they could. But imagine my surprise to see the matter referred to again a short time ago!

We have a big bee country (I will scarcely go to the trouble to tell you how big) but we lose about as much nectar every year as is gathered in the rest of North America. You will probably think we could scarcely stand this great loss year after year, still, although poorer by a few thousands, we are fairly prosperous.

The flora of the country is composed of very many varieties. The first comes in the shape of the prairie crocus, before the snow is fairly off.

The next noticeable and most important spring bloom is the willow. The various kinds of willow extend their bloom over several weeks, yielding both pollen and honey. Other blooms follow in quick succession and increase as the season advances.

It is a treat, I assure you, to see acre after acre and mile after mile of bloom-laden prairie packed out after Nature's own fashion when she chooses to throw on a little. One of the rarest sights I ever saw was on a gentle elevation of the prairie with a poplar bluff as a background. At irregular intervals were scattered shrubs of different kinds, singly and in groups. Half-a-dozen varieties of wild peas and vetches with their pure white, purple and vari-colored bloom, congratulated themselves with the branches as if to get a better view of passers-by. A hundred varieties of flowers of every imaginable color and style filled the place with an uneven and careless prodigality. The dark green verdure, the pure white and the deep purple and rich orange bloom and flowerlets of the most delicate shades and tints, all seemed to vie with each other to outshine in beauty, while in restlessness and ecstasy to every passing perfume-laden breeze they nodded and bowed, fedolent in their rich splendor, which—which—pshaw! it was just simply—gorgeous.

C. F. BRIDGMAN.

Fernton, Manitoba.

When the "write" feeling comes over you again, Friend Bridgman, which we trust will be "write soon," will you tell us the flavors of the honeys you secure? Your flora is so different from that of Ontario. And what system of spring management do you pursue in "the great lone land?"

SUNDRY SELECTIONS.

EXPERTS' DIPLOMAS.

STUDENT—I intend going to the States in the spring, and would like a situation in an apiary. Would a diploma from the International Association help me to better wages, if so can you tell me where an examination is to be held?

We have not heard that anything has been done in the matter beyond appointing a committee.

There are but two ways or methods which I can recommend to prevent swarming. The cause of swarming is traced to the change of the queen. My first method is to supersede all queens that have been laying one season, about the 20th of May, with a young queen. The second and only sure method is to secure a new race of bees that never reproduce themselves, but grow, on the Darwinian plan, perhaps, from some other source. The latter is a conundrum never solved. If this last method does not satisfy the bee-keepers, then swarming must go on as it has for ages past, or as long as the honey bee lives in colonies.—[H. B. ISHAM in *American Cultivator*.

JACOB BULL.—Last spring I commenced the season with 13 colonies, some of which were very weak. I took about 30 lbs. of comb honey and had 13 new swarms, one of which preferred to take its chances in the woods to remaining with me. 2 others I doubled up. So I have now 23 colonies in snug quarters in my cellar. They are exceedingly quiet and are I think doing well. I leave the whole of the entrance open, and although the cellar is not perfectly dark very few bees come out and those I think only old ones. I am of the opinion that most of my neighbors will retire from the bee business in the spring, as last year was so very unfavorable and their colonies are weak. My bees are principally a cross between Blacks and Italians, and are great swarmers and sometimes very cross. I shall introduce more Italian blood next summer.

Weston, Ont., Jan. 14th.

ROOT'S A.B.C.—NEW EDITION.

We have on order to arrive by express another lot of the "A B C of Bee Culture" by Friend Root. This, too, has just been re-issued—the 37th thousand—and much new and interesting matter has been added. We sell more "A B C" than any other; it seems to be so arranged that it is really an A B C for the beginner. The name, too, helps the sale—novices expect to find in it just what they, as beginners, most need.

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Postage.	Per 10 lots.	Per 25 lots.
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1 Chisel handle.....	45	1 10
6 Crayons, colored drawing.....	45	1 00
1 Eraser combined ink and pencil	45	
1 Letter openers, nickle plated, very handy.....	40	
1 Memo books, 32 pages, stiff cover.....	40	90
1 Note paper, 1 quire, extra quality, ruled or plain.....	40	80
2 Pad 100 sheets scribbling paper	45	
1 Pass books 3 "Railroad" 16 p. paper cover.....	45	1 00
1 Pass books, 2 Steamboat 32 p.p.	45	1 00
1 Penholders 2, cherry, swell....	40	
1 Ruler, hardwood, flat, graduated to $\frac{1}{2}$, bevelled.....	45	1 05
1 Ruler, for school children, three for 5c.....	40	90
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Tacks, cut, 2 papers 1, 2 or 3 oz.	45	

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Oil cans, zinc.....	65	
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6 1 doz. Lead Pencils, No. 852, very good.....	75	
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2 Book of 50 blank receipts with stub.....	85	2 00
2 Book of 50 blank notes.....	85	2 00
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3 Butter spades 9c. each.....	80	1 90
2 Boxwood pocket 1 foot rule....	99	2 10
Chisel, firmer $\frac{1}{2}$ inch.....	80	

Postage.

	Per 10 lots.	Per 25 lots.
2 Clips for holding letters, etc...	90	2 00
Due bills, 100 in book with stub	85	1 80
2 Envelopes, 3 packages, white, good, business.....	95	
2 Files, 3 cornered, 5 inch.....	90	2 10
3 Lead pencils, 1 doz. plain cedar Fabers 581.....	90	
2 Lead pencils 3 red and blue....	90	
2 Note heads, pads of 100 sheets..	90	
Paint brush, No. 7.....	90	
2 Pocket note book, 3x5 in., 125 pages, stiff cover with band grand value.....	90	
1 Rubber bands, five, large.....	80	
1 Ruler, brass edged, flat, hardwood, bevelled, graduated to $\frac{1}{2}$ inch.....	95	2 25
4 School bag, medium size.....	90	2 10
Tacks, cut, 3 packages, 4 oz.....	90	

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Glue, 1 lb. ordinary.....	1 30	
Hammer, iron, adze eye.....	1 45	
3 Lead pencils, 1 doz., good quality, Faber's 971.....	1 40	3 35
5 Note paper, 5 quires, 3 lbs., extra value.....	1 40	3 35
Paint brush, No. 5.....	1 40	
6 Rubber bands in gross boxes. For queen nursery.....	1 30	
4 Rule, 2 foot, a splendid line....	1 40	3 40
Screw driver, 5 inch, round bit, hardwood handle.....	1 40	
2 Statement heads in pads of 100	1 20	
Tack hammer, magnetic.....	1 40	3 30
12 Papeterie, 24 sheets fine note paper and 24 square envelopes in neat box.....	1 40	3 35

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Chisel, firmer, inch.....	1 90	
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File, 8 inch, flat, round or 3 corner.....	1 90	
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1½ inch...	1247	17	11	1 00
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2 inch...	350	14	9	80
2½ inch...	214	13	9	75
3 inch...	137	12	8	70

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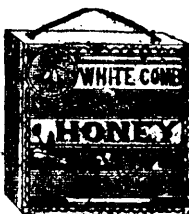
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