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VOL. IV, NO. 48

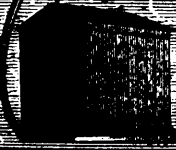
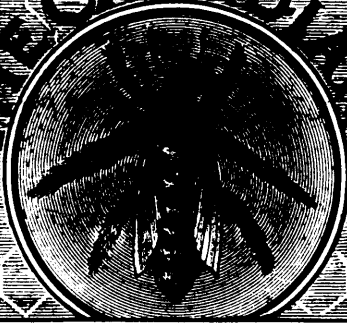
1889

FEBRUARY 20

PUBLISHED EXCLUSIVELY IN THE INTERESTS OF THE HONEY PRODUCER

INTERESTS

THE CANADIAN



JOURNAL

THE FIRST WEEKLY IN THE WORLD

ONE DOLLAR PER YEAR

THE GREATEST POSSIBLE GOOD TO THE GREATEST POSSIBLE NUMBER

PUBLISHED BY  
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BEETON ONT.

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A Bird's-eye view of Bee-keeping by Rev. W. F. Clarke.....	1 25	1 15

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6 lines and under.....	2.50	4.00	6.00
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"American Apiculturist," monthly.....	1.75
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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



BEE-KEEPERS' **PRINTING.**

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

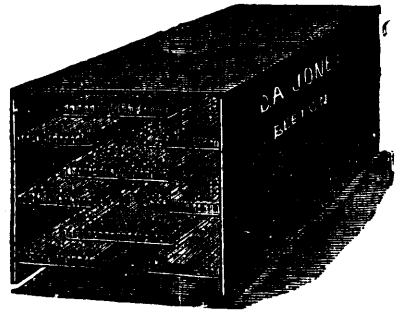
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white.....	1 15	2 00
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THE CANADIAN BEE JOURNAL, BEETON.



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FOR PRICES SEE OUR CATALOGUE, WHICH WILL BE SENT FREE TO ANY ADDRESS.  
THE D. A. JONES CO., LD.  
BEETON, ONT.

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Advertisements for this Department will be inserted at the uniform rate of 25 CENTS each inscription--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.

**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.

**BEES FOR SALE.**

One full colony of pure Italians \$5 each. Ten colonies \$4.75 each, twenty or more colonies \$4.50 each. Tested Italian queens with enough bees to hatch one comb of sealed brood, sent by express before June, \$2.50 each; for five queens \$2.25 each; for ten queens \$2 each. After June 1st ten per cent. off for queens. Safe arrival guaranteed, and references given when wanted.

Address JULIUS HOFFMAN, Canajoharie, N. Y.

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- J. B. MASON & SONS, Mechanic Falls, Me.
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- JOS. NYSEWANDER, Des Moines, Iowa.
- G. B. LEWIS & CO., Watertown, Wis.
- PAUL L. VIALLO, Bayou La Poudre, La.
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- J. M. CLARK & CO., 1409 15th St., Denver, Col.
- E. L. GOOLD & Co., Branford, Ont.

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.

**9 Cords in 10 HOURS**



Runs Easy NO BACKSIE. **BY ONE MAN.** Greatly improved. Also TOOL for filing saws whereby those least experienced cannot make a mistake. Sent free with machine. To others, for common cross-cut saws, by mail \$2.00. Hundreds have saved \$ to \$1000 daily. We want all who burn wood and all interested in the timber business to write for our Illustrated Free Catalogue. We have exactly what you want, the greatest labor-saver and best-selling tool now on earth. First order from your vicinity secure agency. No duty to pay. We manufacture in Canada. FOLDING SAWING MACHINE CO., 203 to 211 So. Canal Street, Chicago, U. S. A.

**WHO WANTS BEES.**

100 COLONIES for sale or exchange for anything I can use. All kinds of bee supplies for sale also queens for sale in season.

JAMES ARMSTRONG, CHEAPSIDE, ONT.

# THE CANADIAN BEE JOURNAL

WEEKLY.

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

VOL. IV. No. 48

BEETON, ONT., FEB. 20, 1889.

WHOLE No. 204

## EDITORIAL

**B**RO. Mason has purchased the *Bee-Keepers' Magazine* and will consolidate it with the *Advance*.

\* \*

Mr. George E. Hilton is writing a series of papers on bee culture for that progressive paper the *Michigan Farmer*. An illustration of his apiary is given, and by that one engraving friend H. has made his bee-yard one of the best advertised in the northern States.

\* \*

We have received a copy of the carnival number of the *Montreal Star*. It is a superb number, a grand souvenir to send to distant friends, and well worth preserving as a memento of the most extraordinary winter in the history of Canada. We cannot describe as it is so elaborate. An order has been booked from London, England, for five thousand copies, while in Toronto and New York it has created a tremendous furor. The last edition is now being run off. The publishers send it to any address for the small sum of thirty-five cents.

For the CANADIAN BEE JOURNAL.

Temperature of Brood Nest in Winter.  
Nom de Plume.

**F**RIEND Jones:—Your "Hallamshire Bee-Keeper," in the issue of February 6th, in writing of the "Temperature of the Brood Nest," says: "I have been much amused at reading American bee-papers lately.

With what unanimity the different writers quote 65° as the correct degree of temperature of the brood nest. I think it was first used in the *Review*, second column, page 74, in reviewing Mr. Cheshire's book." He then goes on and tells how go-ahead are the Americans, but they have no time to correct mistakes. If this "Hallshire Bee-Keeper" will turn to page 74 of the *Review* he will see, if he has time to read carefully, that this "65°" occurs in a quotation from Mr. Cheshire's work, and it is given as such, and marked with quotation marks, while this "Hallamshire Bee-Keeper" refers to it in a manner to lead the reader to believe that it was given as the views of the *Review*, when the *Review* made no attempt to say in this connection what was the regulation temperature.

Now, then, after having said this much, we are prepared to defend 65° as the normal temperature of the inside of a colony of bees in winter. Mr. Cheshire was speaking of winter or spring, and knew what he was talking about; and before again writing upon this subject "A Hallamshire Bee-Keeper" had better make a few experiments. In the meantime he may look on page 190, vol. XIII. of *Gleanings*.

We make this defence here instead of in the *Review* that all who saw the attack may also see the defence.

We see that this same "Hallamshire Bee-Keeper" explains that British publishers do not trim their journals as it would subject them to increased rates of postage. Well, this lets out the British publishers in good shape, and we are happy to say that all the American bee-papers are now stitched and trimmed.

This "Hallamshire Bee-Keeper" says that in England a man is looked upon as "vain and

egotistical" if he uses his own name in writing for the press. Here in America he is looked upon as a *coward* if he uses a *nom de plume*—as one who has not the courage to put his signature to what he has written—as a sort of a *sneak* that hides behind a *nom de plume*.

W. Z. HUTCHINSON.

Flint, Michigan, Feb. 12th 1889.

FOR THE CANADIAN BEE JOURNAL.

### Bees Stealing Eggs—Vagaries of a Queen.

**Y**OU want to know what the pranks were that my bees were cutting up during the past season, so I will begin and give you some of them. I had one colony queenless in spring, and as it was pretty strong and expecting some swarms to come off in a short time I allowed them to remain without a queen until some of the other colonies swarmed, when I would have queen-cells to give them. A few days after my best colony of Italians swarmed I opened their hive and cut out a nearly matured queen-cell, took it to my queenless one to insert in one of their combs. But on opening the hive and lifting from the centre the frame to which I intended to attach the cell, you may judge of my surprise on finding a queen cell with a queen larva nearly ready for being sealed over and not another larva or egg to be found in the hive. Did they steal the egg from which this larva was produced, or how did it get there? If they did not, is it possible that in their anxiety for self-preservation they might even steal to preserve the existence of the colony? I can account for it in no other way and would like you or some of your experienced correspondents to give their views on this subject through the columns of the C.B.J.

The next freak, the only one besides the above that I will mention at this time, and one that I must say puzzled me even more than the other, was the, to me at least, strange conduct of a colony into which I introduced a pure Italian queen, a very fine one. I put her in the hive, as I thought, successfully. She went in among the bees quietly and they showed no hostility to her, nor any signs of being queenless afterwards. But on the evening of the fifth day after introduction I wanted to see how she was working, but could find no sign of her in the hive, but instead I found seven queen cells built, three of them being sealed over. I went to work at once and cut them all out, went to another hive and took from it a cell that was nearly ready to hatch out and inserted it in place of those I had destroyed. I went the next morning to see if it was hatched but found the side of the cell torn open and

empty. I knew at once that there must be another queen in the hive and on looking over the frame in my hand on which the cell had been torn open and its inmate—allow me to say—murdered, I saw my old queen majestic and unconcerned, striding over the comb on which her inoffensive rival had been slain, which brought me to the conclusion that a virgin queen had been sent me instead of a fertilised and laying one, and that the bees, on account of her not laying, commenced building cells to raise another one to supersede her, and that she had been out on her mating or bridal tour when I first looked for her, and on her return had destroyed the one given in the cell. I at once wrote to the party who sent her, informing him of what had happened and the conclusion at which I had arrived. He was not at all surprised at my conclusion, but assured me that the queen had been laying before he sent her, but he very generously sent another, a tested queen, to replace her, for which he shall always have my best thanks, but the matter is as yet a mystery to me, and I hope I may yet get some light on it. You or some other person may enlighten a novice thorough the C. B. J.

Yours very truly,

ALEX. BLACK.

Sonya, Feb. 11th, 1889.

FOR THE CANADIAN BEE JOURNAL.

### A Correction—A Word to Disbelievers.

**B**Y going over the file of C. B. J. again, particularly for the purpose of reading your articles on "Practical Bee-keeping" with leisure—you know during hunting time those papers are stored away, because excitement is then too high and the general talk is deer and the shooting of them—I found in your comment on Muskoka an error, which should have been corrected before this. On page 888, C. B. J., you say:—"We are privately informed—that a lot of Bro. S's. colonies were not weighed—if they were it would bring the yield much higher." Your informant should have said "Hives," instead of "colonies." I weighed my colonies as stated, in my report, page 732, C. B. J. but had a lot of well filled and sealed combs in hives, which I did not weigh, in all about 250 lbs. Of these I sold 50 lbs. to some neighbors, who had found some late swarms in the bush for wintering. A hundred pounds or so of the finest, we used at the table, and another hundred pounds or over are in the combs yet, which I will not be able to extract till next summer. I did not include this lot in my report nor any of the drippings from the cappings (of

which we made wine, etc.) for the very reason that I did not like to be ridiculed for the very truth. Of late a very disbelieving spirit has manifested itself in the C. B. J. Reports, that are a little above the average are commented upon in words like:—"We sometimes hear a very big sound out of a very small horn" thus bringing the honesty and truthfulness of following bee-keeping in question. This ought not to be so, it tends to drive out reports of the bee-keepers, by which a novice can surely learn more as by the disputing articles with foreign bee-keepers and editors—particularly, when the management of the apiary is given connected with the reports like Mr. Doolittle, A. Pringle and others are in the habit of giving. For my part I consider every bee-keeper honest and high enough in morals not to lie unto his own pocket and deceive himself and others, and should there be one lacking of this standard he may at once be classified with the blasted hopes.

My bees are wintering very well so far. Some time ago one showed signs of dysentery, but they are quiet now. By scratching some dead bees from the entrances I broke the cluster of one colony which reached right down to the bottom-board. Thermometer this morning in cellar forty-two degrees, while outside thirty degrees below.

E. SCHULZ.

Kilworth, Feb. 14th, 1889.

From the Bee-Keepers' Review.

#### "PRACTICAL BEE-KEEPING."

AS mentioned in the December Review, Mr. D.A. Jones is writing, and publishing in the C. B. J., a series of articles on "Practical Bee-Keeping."

It is seldom that a work of this kind is above criticism, and the fault we have to find with this one is that, especially in the opening chapters, too much space is taken up in giving well known facts—those found in nearly every text book. But there might be more objectionable features than this, and we shall probably find plenty that is new.

Like every practical bee-keeper, Mr. Jones sees the advantage of learning the business the same as other kinds of business are learned—by actual work in a well managed apiary. He says a student ought not to expect pay the first year. He urges the teaching of the elementary principles of apiculture in schools. We believe that our schools should teach those branches only that are needed in all the walks of life; and not meddle with the bees, hens and pigs. In mentioning the desirable spots for locating the apiary, Mr.

Jones speaks of the orchard. Mr. Allen Pringle; who is reviewing these papers, objects on the ground of too much shade. After trying both shade and open exposure, he prefers the latter. He says the bees build up faster in the spring, and work more hours; that the expense of providing some cheap shade in very hot weather is trifling compared with the advantages accruing from the sunshiny location. We agree with Mr. Pringle.—Mr. Jones tells us, and we know it, to be true, that bees may be kept near a highway without making trouble to passers-by, if there is some barrier, as a row of trees or high fence, between the bees and the street. In passing over the obstructions the bees fly so high that they are above the travellers on the road. It is not necessary that the fence should be absolutely tight, because the bees are not inclined to fly through small openings. When a fence is not enough, four-foot lath, nailed six inches apart to the top of it, with a strip along the top of them to keep them in place, will cause the bees to pass over. Our author advises using only one style of hive, while his reviewer (Mr. Pringle) argues for the use of several kinds. The principal reasons given for having different kinds being "a scattering of chances, as it were in the varied seasons, and in the contingencies of wintering." This time we are with Mr. Jones. Give us the best hive there is for our particular needs, and in the "scattering of the chances" we will take our chances. Mr. Jones says that one of his yards is a solid bed of sand; and he finds that, while it has its drawbacks in windy weather, the bees are always ahead of the others in breeding up in the spring. He attributes this to the heat being retained by the sand and reflected upon the hives. Wind-breaks are desirable, and all the apiaries owned by Mr. Jones are surrounded by board fences eight feet high. Many writers have advised beginners to buy bees in box hives and transfer them to movable-comb hives. We are glad to see that Mr. Jones is so sensible as to advise against such a course. He says the novice had better buy bees in good movable-comb hives, and let alone the troublesome job of transferring until he has attained some skill. When writing of black bees Mr. Jones says: "Some apiarists claim to have a race of large, brown bees; but these are, I think the ordinary bee bred in localities favorably situated to assist the bee-keeper's efforts in breeding for selected stock." There is certainly a difference in black bees, and we have secured this larger, browner strain in box hives, from the apiary of some old fashioned bee-keeper who had made no attempts at selection. From personal observation, and otherwise, Mr. Jones infers



that the bee indigenous to Italy was the black or brown. He believes that the light-colored races originally came from Palestine and Syria; that coasting traders in honey and wax brought them to Italy, where the dark natives were, to a great extent, crowded out by the hardy and vigorous Syrians. On the cessation of this trade in-and-in breeding was practised for hundreds of years, and this has produced the Italians of today. Mr. Jones looks upon the so-called "Albinos" as merely bright strains of Italians. It has been urged as an objection against the Italians that they do not work so readily in the supers as do the blacks, but with our improved methods, says Mr. Jones, this and other objections are overcome. Speaking of the Syrians, he says: "Their former admirers have, in a great measure, become disgusted with them on account of their exceedingly irritable disposition. They are great breeders, the queens being wonderfully prolific, but they frequently consume all their stores in brood-rearing." On the whole he does not recommend pure Syrians or Cyprians as adapted to the northern part of America. In the South, Texas or Florida, there may be localities to which they are adapted but for more northern localities there are more suitable bees. As yet, Mr. Jones has found no pure race possessing all good qualities with none of the bad. He has tried crosses of the various races, and is convinced hybrids give better results than pure races. He does not consider the Cyprians a desirable bee; but with the Syrio-Italians and the Syrio-Carniolans he has achieved splendid results. He cautions us against deciding that the goal has been reached because a first cross is of extraordinary value, for it seldom duplicates itself. In crossing varieties, he urges that particular attention be given to securing the best of drones, as the male has the most influence on the quality of the progeny. But few persons, if any, have had greater experience with the different varieties of bees than has Mr. Jones, and his views are certainly worthy of attention.

(To be continued.)

From the American Bee Journal.

### FACING HIVES.

HOW TO PLACE THE HIVES WHEN TAKEN FROM CELLAR.

IN which direction should bee-hives front is a question of great importance. It is also one very little discussed by our ablest apicultural writers, though we have been advised to set out windbreaks, or build a high fence, and behind all this have the location facing in a southerly direction, thus making a warm, cosy place for the bees in early spring, and a very

hot place in the summer. This, in my thinking is very objectionable, as here is liable to occur great mortality in early spring, and an abundance of swarming right in the midst of the white clover harvest, and before they are really strong enough to swarm; where, if the hives had been fronting northerly, with scattering shade trees (not high trees), so as to shade the hives a part of the time, the trouble might not have occurred.

I would not advise having shade trees very thick. It is from personal experience that I write. I have been experimenting in this direction for about ten years, and I think that I have come to a conclusion that is satisfactory to me. I cannot control my bees in a hot or sultry, close place, for they will hang out on the fronts of the hives, and at a loss of honey, or at my expense. The better the honey-flow, the warmer is the inside of the hive, so it would be well for us, even in this latitude, not to choose too hot a place for the hives. If I should have any slope at all, it would be in any direction except south.

On the other hand, early spring is very trying, and at this time of the year we should do all we can to save the old bees, for if we accomplish this, other things being favorable, we will have plenty of brood, and plenty of bees to gather the clover honey. For hours in the spring of 1888 I watched, with much interest, the little bees fly from the cosy and well-protected apiary, on which the direct rays of the sun rested, causing the bees to take wing in great numbers. Over the willows they flew, with the temperature at 45°, though there were clouds at times, and chilly northern breezes. If my bees had been on the north side of the willows, they would not have been out, taking the chances.

I had one row of hives fronting north, and where the cool breezes could strike the entrance; these bees did not dwindle to any extent, while those in the sun, and facing south, though protected from the wind, dwindled down on the average of one-third of the bees. Thus it may be seen that if the white clover had yielded a surplus, I would have been the loser of hundreds of pounds of honey. In short, I think quite positively, that it is not best to carry bees from any repository, and front their hives to the south, in a sunny and close yard.

FRANK COVERDALE.

Welton, Iowa.

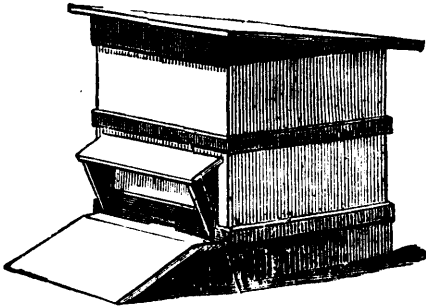
Attention is called to the list of books in this number. In this connection we might say that we can supply you with any standard book on the market and at lower rates than the stores. Write for prices on the works required.

# PRACTICAL BEE-KEEPING.

BY D. A. JONES.

## PAPER V.—CONTINUED.

**A**CROSS the Atlantic, in the mother country, double-walled hives are used much more largely than any others. Over there they have a "standard" frame, the dimensions of which are 14 inches wide by  $8\frac{1}{2}$  inches deep, the top-bar being 17 inches long. This standard has been set up by the British Bee-Keepers' Association for some years, and there are, I believe, few, if any, manufacturers who do not conform to the standard, no matter what the shape or style of the hive. The engraving gives a good idea of the outside appearance of the hive.



THE COWAN (ENGLISH) HIVE.

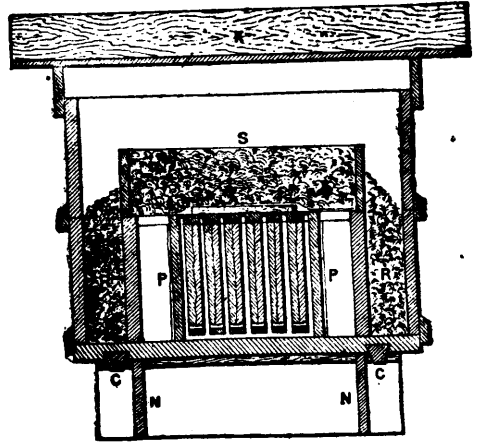
The second engraving shows the hive as arranged for winter, with cork-dust packing R. R. and S. Of the method of contraction here shown I will speak when we come to the subject of "Wintering."

I have not gone into the minutiae of the construction of double-walled hives of any sort, as more space would be taken up than the value of the subject would warrant, and because so few are used in Canada.

### THE HEDDON HIVE.

In the beginning of the year 1886, Mr. James Heddon, of Dowagiac, Mich., introduced to the public an invertible hive, having the brood-chamber divided into two sections, also the surplus ar-

rangement, both of which may be interchanged or inverted at will.



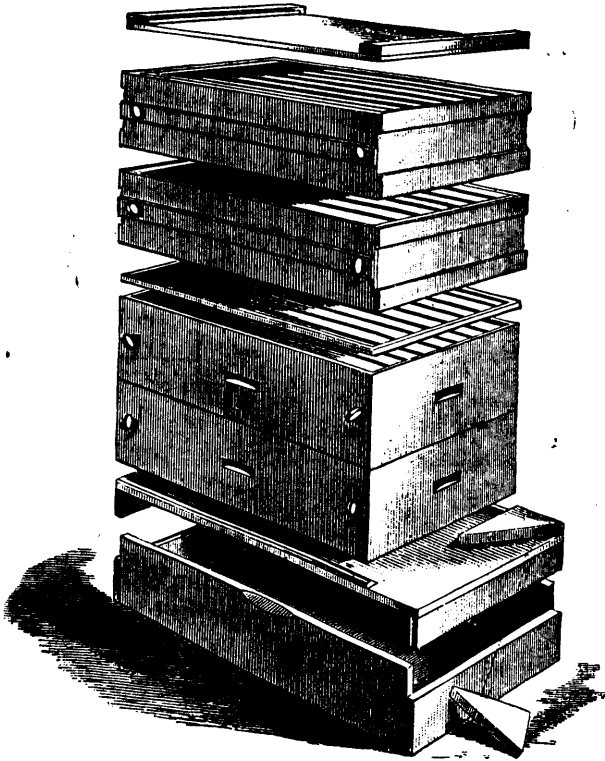
SECTION OF COWAN HIVE.—WINTER PACKED.

The lower figure in the engraving which we show on the following page, shows the stand. Next comes the bottom-board, on the bottom of which are nailed the cleats which come down over the stand and keep the bottom-board well in place; on the upper side of the bottom-board (around two sides and one end) are nailed strips  $\frac{3}{8}$  inch deep and  $\frac{3}{8}$  inch wide, upon which the hive rests, thus giving a good bee-space below the frames. The two sections of the brood-chamber are next shown, each of which are  $5\frac{1}{2}$  inches deep by  $19\frac{1}{8}$  by 13 inches outside, the end  $\frac{7}{8}$  inch and the sides  $\frac{3}{4}$  inch thick. The inner part of the top and bottom edges is rabbeted down  $\frac{1}{16}$  inch, leaving a rim  $\frac{3}{8}$  inch wide only, so that when the boxes come together they touch only at the  $\frac{3}{8}$  rim, while the  $\frac{1}{16}$  rabbet in each make together a full bee space of  $\frac{3}{8}$  inch. The frames for the brood-chamber are closed-end, and are dovetailed together at the corners. The top and bottom bars are  $\frac{1}{2}$  inch wide by  $\frac{1}{8}$  by  $18\frac{1}{8}$  inch, while the end pieces are  $\frac{3}{8}$  inch by  $1\frac{3}{8}$  inch by  $5\frac{3}{8}$  inches (just  $\frac{3}{8}$  inch shallower than the section of the brood-chamber). The end-pieces are  $\frac{1}{8}$  inch wider than

the top and bottom or side bars, half the extra width going to each side, so that when the frames are placed together, a full bee space of  $\frac{9}{16}$  inch is maintained between all the frame sides. The frames are held in the case by strips of tin the full length of the ends and one half inch wide, so that the projection of  $\frac{1}{8}$  inch at each end catches the edges of the frames and keeps them from falling through. The width of the case in side is  $11\frac{1}{2}$  inches into which eight frames, each  $1\frac{3}{8}$  inches,

#### HONEY-BOARD.—BREAK-JOINT.

Above the two sections of the brood-chamber, as shown in the engraving, will be seen the honey-board, which is arranged on the "break-joint" principle—the slats standing over the interspaces between the frames in the brood-chamber, the object being to prevent brace combs being built. The outside frame which holds the slats in position is  $\frac{3}{8}$  inch thicker than the slats them-



THE HEDDON HIVE.

are placed, occupying 11 inches of space and leaving  $\frac{1}{2}$  inch play which provides the space required on the outside of the outer combs. To divide this, light strips  $5\frac{3}{8}$  inches by  $\frac{3}{8}$  inch by  $\frac{1}{4}$  inch are nailed in the corners on the side opposite to the one in which the thumbscrews are placed. These thumbscrews are boiled in tallow and are tapped into the sides, so that their ends work on the edges of the wide sides of the frames, compressing the ends so firmly together that the frames are held tightly in position when the sectional brood-chamber is inverted.

selves, divided on each side, thus retaining the half bee-space. Here in Canada we always place strips of perforated metal in the interstices between the slots to make the honey-board queen-excluding.

#### SECTION CASES OF HEDDON HIVE.

The supers, or section cases, are constructed after much the same principle as are the brood-chambers, excepting

NOTE.—None of the engravings of the Heddon hive as made on this continent have been at all good; we have therefore taken the liberty of reproducing the engraving as shown in Chesbire's "Bees and Bee-keeping," which is constructed on a scale of 1/12th.

that the sides are but  $\frac{3}{8}$  inch in thickness and the whole case is shallower by  $\frac{3}{8}$  inch. The sides are strengthened by battens (which also serve as hand-holds) through the ends of which, on one side, the thumbscrews are put. The inside measurement in with the super is thus 12 inches into which seven frames (each holding four sections  $4\frac{1}{4}$  inches by  $4\frac{1}{4}$  inches) are placed, resting upon the tin rests, as described for the brood-sections. The frame ends are  $\frac{1}{2}$  inches wide and the sections are of the same width. The half bee-space is maintained above and below these frames as in the brood-chamber.

#### THE COVER.

The construction of the cover will be understood by a reference to the engraving.

From the Australian Bee Journal.

#### Is the Ventilation of Hives Yet Perfected?

THE ventilating arrangements which our architects and builders provide for our houses in general and rooms in particular, are, from a scientific point of view, far below those of the lowest type of savages as yet interviewed. The escape of vitiated air is left to chance, but every chance, the removal of which does not involve additional expense, is carefully blocked. This is no reason, however, that we should retaliate on bees. Moreover, their paying powers largely depend on proper ventilation, it being one of the essential factors in their well-being. In summer, if the ventilation is too little, time is wasted in fanning, and the bees cluster outside. In winter, if the ventilation is too little, condensed moisture is not carried away and diseases supervene; if too great, bees die off; and in case of winter brood, it gets chilled; in either case spring dwindling ensues. There is, then, no apology necessary for urging that the ventilation should be considered on scientific principles and if common sense puts in a claim as sufficient, be it remembered that common sense, if worth anything, is only science arrived at in an unscientific way, and that it very soon gets out of its depth.

Let us examine the factors at hand for the regulation of hives, and in so doing let all disturbing influences of the wind be left out of consideration, as having to be dealt with otherwise.

I. The *motive power* must, from the circumstances of the case, be the common one furnished

by the expansion of air under the influence of heat, and the consequent difference in weight between a given quantity of warm and cold air. Air expands  $\frac{1}{333}$  for every degree.) A hot column of air in a tube, such as a chimney or a bee-hive, if surrounded by a mass of colder air, ascends with a rapidity which varies with the difference between the two temperatures, and the height of the column of hot air. The greater the difference between the two temperatures, the greater the rapidity of the upward movement, while a greater height of the heated column slightly retards, although it steadies and gives power to, the total mass within.

Now the heat of the column of air in a hive is, theoretically, a fixed quantity, viz., about  $85^{\circ}$  F., this being reckoned to be about the temperature at which the blood-heat of the bees keeps a hive if there is no disturbing influence, such as wind, or the excitement previous to swarming. It necessarily follows that on a hot summer's day, when most ventilation is needed, then it is that the motive power is the least and the ventilation least, and frequently *nil*, because the outside temperature approximates to, or exceeds, the inside temperature; and, secondly, that in winter, and on cold summer nights, when least ventilation is needed, then it is that the motive power is strongest, as the normal temperature inside will be about  $85^{\circ}$ , and outside  $50^{\circ}$ ,  $40^{\circ}$ ,  $32^{\circ}$ , or lower. This at once involves the conclusion that if a steady temperature within is necessary for the well-being of bees, *it must be controlled artificially.*

The principal, and perhaps, practically, the only, controlling power at hand, is the size and number of the apertures left for the passage of the heated air inside. Although exact statistics are of no very grave moment in this matter, yet it may be mentioned that if the formula given in Brand and Cox's *Dictionary of Science* has been worked out correctly, the column of hot air inside an ordinary Langstroth one-storey hive would move upwards at the rate of 6 inches per second if the temperature outside was  $80^{\circ}$  F., and at the rate of 30 inches each second if the temperature outside was  $30^{\circ}$  F. But this implies a perfectly unimpeded means of entrance and exit, such as is supplied by the open fireplace and top of a chimney. Every inch of glazed mat, or of the superficial extent of the aggregate of the threads of a porous mat, lessens the velocity of the passage of the heated air, and consequently tends to keep the air in the hive mere and more at rest. Moreover, as the cold air enters, the difference between the two temperatures is lessened, and consequently the rate

of the ascent of air at once diminished. It is not until the bees have again been able to raise the temperature to its normal state that the power of the motive agent at the start would be again exerted. Again, the friction against the frames, bees, combs, and threads of the mats, all diminish the rate. It would, therefore, obviously be impossible, owing to the variety of changing conditions, to draw up in a tabular form the exact number of times in which the whole interior atmosphere in a hive will be changed in each hour at various rates of temperature outside. However, it is of such grave importance that the hard facts of the case should in some visible way be realized, that the following table, in which 200 per cent. is allowed for retarding purposes, is presented:

Temperature inside the Hive	Temperature outside the Hive.	The approximate number of times the air inside will be changed every hour, with apertures in the mat of the aggregate of			
		(A)	(B)	(C)	(D)
		6 sq in	4 sq in	2 sq in	1 sq in
85° Fahr.	80° Fahr.	75	50	25	6
85° "	60° "	154	103	53	13
85° "	40° "	225	150	75	18
85° "	30° "	250	166	83	20

The above table is based on the formula above referred to, and on the assumption that there are about 1000 cubic inches of air inside a hive, and that friction &c., may diminish the theoretical rate by some 200 per cent. With reference to the aggregate size of the interstices in mats, (a) 6 square inches would imply that in each square inch of the mat there were about twenty interstices, each  $\frac{1}{10}$  in. large, perhaps represented by very coarse scrim; (b) four square inches would imply that in each square inch of the mat there were thirty-two interstices, each  $\frac{1}{8}$  in. large, represented by finer scrim; (c) two square inches would imply that there were in each square inch of the mat, about forty-eight interstices, each about  $\frac{1}{6}$  in. large, represented perhaps by coarse washed calico; (d) one square inch would similarly imply about sixty interstices, each  $\frac{1}{6}$  in. large, represented by finer calico.

Assuming, then, the above calculations to be sufficiently correct, we can get a tolerably clear idea of what takes place in a hive on a typical summer's day, or a typical winter's day. In summer, with a common scrim mat, as represented by (b), in the daytime, the mass of air inside would either be stationary, owing to the sun's heat being 85° or over (the usual state of things under the direct action of the sun's rays, that is, not in the shade), or changed about once a

minute, but without much change of temperature. In the evening and night of the same day it would be changed two or three times every minute, and this to a temperature of from 40° to 50° F., quite as much as can be good for the brood. On a typical winter's day, with a mat of the same porosity, the air will be changed about once and a half every minute to a temperature below 85°, of, say 65°, and in the night time about three times every minute, and this to a temperature freezing, or nearly 30°.

It must therefore be taken for granted that there ought to be some check to the ventilation both in evenings of summer days and still more in evenings of winter days, even though in winter additional mats are put on, and so the evil somewhat diminished. It cannot be good for the brood in summer to be from eight to ten hours in our usual night temperature, even though it be mitigated by the presence of a large number of bees on the brood-combs. Still less can it be good for the bees in winter to be in our chilly New Zealand night air. Either by direct manipulation, or by some self-acting simple mechanism, there ought to be some stoppage of the passage of the warm air in the latter cases.

Some further suggestions as to ways of obtaining this end I hope to have an opportunity of making; for the present let it suffice, if the grounds for necessity of some such contrivance shall have commended themselves to the minds of bee-keepers.

NOTE.—One fact in connection with the motive power evolved by the expansion of air when warmed has only been casually noted above, owing to its very limited applicability to the Langstroth hive, and that is, the slightly retarding, but at the same time steadying, effect of a long column of warm air, which gives a powerful pull to the whole. A homely instance of this is the better draught obtained by a tall chimney over that obtained by a short one. The contrary effect is shown by the extraordinary power of a long column of water, even in a tiny pipe, as those who try with their fingers to stop the kitchen tap, supplied from a cistern or reservoir, can testify. The Stewarton hive, which, although not known over here, and not much used in England, produces a most astonishing amount of honey, probably owes its success to this principle, and not to its shape. It is hexagonal, but runs up to six, eight, or more storeys. This length of hot air enables the mat to be very fine, as the power evolved forces the air through its pores. Extreme steadiness is thus obtained, and in cold nights and wintry days the ventilation is very slow but regular—just what is wanted.

Read at the New York State Convention.

### HOW DO BEES BREATHE.

**B**EES require a breathing apparatus quite as well as ourselves, and I think it will astonish you when I tell you how complicated it is. In the first place, bees have no lungs like a horse or bird. They do not depend upon one organ to supply the oxygen necessary to enable the several parts to perform their functions.

Before going further, let me explain that the air we breathe is composed of three gases, one of which, oxygen, is the element that sustains life, as well as the fire which burns in the grate. Life may be called a burning process.

In ourselves, our blood comes in contact with oxygen within the lungs, and then travels by the most delicate channels to every part of our body. In the bee there is a blood pump like our heart. It is called the "dorsal vessel," and resembles somewhat an injector, such as is found on every locomotive, but depends upon the opening and shutting of valves, for its successful operation. It leads the blood, received through the several openings in it, to the head, whence it oozes back through the whole body.

Instead of lungs, bees have what is called a "tracheal system"—a trachea is merely an air-tube—and these air tubes travel in every conceivable direction within the body. They receive the outside air through openings in the body called spiracles. Adult bees have fourteen of these openings. The spiracles open into large sacs, from which branch out the tubes before spoken of. As I before said, the blood does not receive the oxygen from lungs, and hence these air-tubes must perform this life-giving function. Every part, every member, however small, however delicate, must be reached by these breathing tubes. Bees breathe with a regular motion, but instead of an expanding and contracting of the chest, it is a lengthening and shortening of the abdomen. Watch a tired bee stop at the entrance before going in, and you will see it pant like a tired horse.

Take a good sized pill-box and fill it half full of wax. Catch a worker, and kill it with ether, chloroform or alcohol, and permit the killing fluid to evaporate. With a hair pin, heated over a lamp, make a little bath of melted wax in a convenient spot in the pill-box, and having dipped off the wings and legs of the bee, drop it on its back in the little bath aforesaid. The bee should not be more than half immersed in the wax, which is then allowed to cool. When cold, which will be in about a minute, pour water over the bee until it is covered. In a good

light—say sun light—with a needle knife (made by heating the point of a coarse sewing-needle until red hot, hammering it with a tack hammer, on the face of a flat-iron, and after tempering by heating cherry red and plunging in water, sharpened on a hone, and inserted in a match for a handle), and a fine needle inserted in another match, go to work and cut away the under part of the rings of the abdomen, and carefully lift them off.

If you have good eyesight, or if not, by aid of a cheap lense (magnifying glass) of good construction, you will be astonished at the sight before you. There lie the honey-sac, digesting stomach, bile tubes and intestine. Running in all directions, but starting from the sides, you will note fine white tubes branching out into smaller, and these organs into still smaller, until lost to sight. These are the air-tubes I have been talking about, and you will note that they not only encircle the digesting stomach, but are wound around the other parts in sight. If your lense be strong enough, and you have not ruptured it in your dissection, you may find the nerve system, which lies just under, or when the bee is right side up, just over the wax-producing portion of the abdomen, and which runs the whole length of the bee from tail to brain. You will find it composed of two "cords" almost transparent, with occasional bulgings in which the two "cords" are joined. In and about this very nerve system you will find the fine breathing tubes before spoken of. Up into the compound eye, with its thousands of lenses, run other breathing tubes, every lense being supplied with oxygen in this manner, so that its functions may be performed.

JOHN ASPINWALL.

From Gleanings.

### FLOATING APIARIES IN EGYPT.

**T**HE following sketch we copy from the *Deutsche Illustrierte Bienen Zeitung* for November, page 44. The article was written by Mr. T. Kellen, of Luxemburg. W. P. Root, our proof-reader, translates as follows:—

Not long ago I discovered in the city library of this place, Luxemburg, a French work on bees, which for a century had been unremoved, leaves uncut, and was covered with venerable dust and finger-marks. In this work I found a very interesting notice in reference to portable apiaries of that period. The author of the above work, B. E. Manuel, procured some notes of a description of Egypt, and added a few concluding observations of Reaumer thereto. From this and other histories of travels, as well

as from Maillet's Description of Egypt, published in 1740, it appears that, in the last century, there was a great many colonies of bees kept in the land of the Pharaohs, and that a very lively business was maintained therein, quite unlike what we have in our own country. Dr. Westhau reports, in a description of a travel through Egypt, in 1702, the following: "In many places I found apiculture greatly hindered, notwithstanding the inhabitants manifest much interest in it. In the season of bloom they move with their bees, now here and now there, in order to fill their hives with honey."

In the last century there was found, with all of the ignorance and wildness of the inhabitants, an occasional trace to remind one of the previous luxury of a keen and diligent generation, long past. One of the most noticeable evidences of their activity was the annual sending of their bees to remote districts, that they might secure pasturage, which occasionally failed them at their own stands.

As Upper Egypt is hotter than Lower Egypt, and the land there is freer from the inundations of the Nile, the honey-plants there develop at least six weeks earlier. The inhabitants were fully aware of this fact, and availed themselves of it for the benefit of their bees. In Lower and Middle Egypt they placed a certain number of colonies of bees, which were often kept in jugs and bowls, and often in cylinders or baskets made of burnt clay, or made out of withes braided, and besmeared with Nile slime, made expressly for this purpose—forerunners of the portable bee-hives of Swabia. If the hives were required at the upper end of Egypt, they were transported thither, so the bees could visit the neighboring honey-plants and shrubs. When the crop in Upper Egypt was exhausted, they floated the skiffs a few miles down stream, and waited there as long as honey could be found in paying quantities.

At the beginning of the month of February they arrived at Lower Egypt, where they delivered the hives back to their owners. The latter then sold the entire product at wholesale in Cairo. The bee-keepers from Upper Egypt, after they had disposed of their products in the region of the delta of the Nile, and had secured what honey they could there, returned again up stream to their homes. Unfortunately, hitherto history has furnished us no details in regard to portable apiaries in this land of early antiquity, which are authentic; nevertheless, it is easy to conjecture that that inventive people, as the valley of the Nile bears them witness, will convert it, as they did a century ago, into the business of portable apiculture. One may easily believe that Egypt first suggested the same business to Greece and other lands. The Roman agricultural writer, Columella, writes (*De Re Rustica*), Book IX., chapter 14, in replying to Celsus, that in Achaia the bees from Attica and Eubœa, on all the Cycladian islands to island of Skiros, and from the various Sicilian coasts to Hybla, were cultivated for honey. This custom was, in all probability, introduced from Egypt at the time of Solon, for the civilization of Egypt is unquestionably much older than that of Greece. Before Solon arose as reformer in Athens he travelled through Egypt, and learned

there how to make many improvements which he afterward made useful to his native land.

But how stands bee culture now in Egypt? When even the fellahin and Copts conspire to drive out apiculture, no more will be read in modern history of travels in Egypt in regard to moveable apiaries; and no traveller will see any more the skiffs on the Nile, laden with hives. This is easy to be seen, when one reflects how downtrodden Egypt is under the foot of the Mohammedan.

Daily News.

### BEE-KEEPING IN IRELAND.

**M**AKERS of bee-hives with moveable frames by which portions of the comb can be removed, will find a good advertisement in the recently issued Agricultural Statistics for Ireland. The Registrar-General states that in the whole island there were 28,569 swarms at work, of which 9,135, or nearly one-third, were kept in "hives having moveable frames," and 19,434 in other hives. The quantity of honey produced was 459,386 lbs., or an average of 16 lbs. per hive, an amount which probably exceeds what the uninitiated would consider possible. But of this total yield nearly half was gained from the new-fashioned hives, so that while the average store of a swarm kept in one of them was 23 lbs., that of a swarm living in the less commodious dwelling was only 13 lbs. It is curious to note that in Connaught, where there are less than one-fourth the number of swarms to be found in each of the other three provinces, the yield of honey per hive is considerably greater. Evidently the struggle for bee-existence is less keen, for while an Ulster swarm will collect 22 lbs. a Connaught swarm will amass no less than 29 lbs. But the most productive hives in Ireland are to be found in Kildare, where 218 of the "moveable frame" type produced an average yield of 37 lbs. of honey for each swarm.

### QUERIES AND REPLIES.

UNDER THIS HEAD will appear Questions which have been asked, and replied to, by prominent and practical bee-keepers—also by the Editor. Only questions of importance should be asked in this Department, and such questions are requested from everyone. As these questions have to be put into type, sent out for answers, and the replies all awaited for, it will take some time in each case to have the answers appear.

#### Average Honey Crop for Ten Years.

QUERY 219.—What has been the average honey crop for the last ten years, and is the average getting larger or smaller? Supposing any of those whom you ask for replies have not kept

a record, I would like them to give an estimate.

DR. C. C. MILLER, MARENGO, ILL.—From 30 to 40 lbs. It has been very small for a few years.

S. CORNEIL, LINDSAY.—About 60 lbs. extracted in ten years, during which there were three blanks. Smaller.

A. B. MASON, AUBURNDALE, OHIO.—With the exception of the last two years the average has been getting slightly larger.

PROF. A. J. COOK, LANSING, MICH.—About 75. For the last two years it has been very light, but I do not expect it to continue so.

W. M. BARNUM, ANGELICA, N.Y.—(1). I cannot say positively, but to give an estimate would say 20 lbs. (2). Yes; increasing in ratio of modern hives.

G. M. DOOLITTLE, BORODINO, N.Y.—About 75 lbs. per colony of comb honey each year. Smaller, for the eight years previous to 1879 gave an average of over 100 lbs. per colony each year.

JAS. HEDDON, DOWAGIAC, MICH.—In and about my locality I estimate the average crop as steadily decreasing during the last ten years. We hope there is a better series of years just before us.

J. E. POND, NORTH ATTLEBORO, VT.—I have no means whatever of knowing, and cannot even guess, although I am a Yankee. Massachusetts gives a very small amount of honey compared with other States.

EUGENE SECOR, FOREST CITY, IOWA.—About 50 lbs., actual record. I believe there is not much if any difference in the yield, now and formerly, in this locality. Some honey flowers are decreasing while others are increasing.

G. W. DEMAREE, CHRISTIANSBURG, Ky.—The three past years have been, out of all proportion, poor years, and from this cause it is hardly fair to embrace them in a ten year's average, because three years together is unusual. But taking the past ten years, including the three unusual years, the average has been fifty pounds, as near as I can fix it.

ALLEN PRINGLE, SELBY, ONT.—The average would probably be not far from 50 lbs. per colony. Probably a slight increase of average, over the previous decade. It is impossible to give more

than an approximate answer to such questions. Had the past three years been equal to the remaining seven of the decade, instead of "slight increase" it would be "large increase."

J. K. DARLING, ALMONTE, ONT.—If it is the average per colony that is wanted I will give mine for the past six years and I think it is a fair average for this locality. 1883, 71 lbs. per colony, Spring count; 1884, 45 lbs. per colony; 1885, 43 lbs. per colony; 1886, 23 lbs. per colony; 1887, 16 lbs. per colony; 1888, 2 lbs. per colony. Some bee-keepers have taken more while others have taken less.

R. MCKNIGHT, OWEN SOUND.—I should say 50 lbs. per hive will cover the average and it is probably getting neither larger or smaller. We may safely infer that the average of linden honey is less than it was ten years ago, because basswood has been largely used in the manufacture of lumber in the meantime, and is therefore reduced in quantity, but the increased area under white clover and alsike makes up for the loss on linden.

WM. McEVoy, WOODBURN.—Some fifteen, some forty and a few first class bee-keepers that took the very best of care of their bees have averaged about seventy-five pounds to the colony. The average for the ten years before 1878 was very small, because honey extractors, comb fdn., and section boxes, were not much used then, and many kept their bees in box hives. In the last ten years there has been a greater circulation of bee journals and frame hives, honey extractors, comb fdn. and section boxes have come into general use everywhere, so that the average was getting larger in the last ten years. 1883 was the best honey season ever known and the last season was the worst.

## SUNDRY SELECTIONS.

### PORK BARRELS FOR HONEY.

A READER.—Will zinc do to store extracted honey in? If not, will a coating of beeswax make zinc all right?

No, we think it very objectionable. Would prefer good tin. A coating of beeswax would help to prevent the acid in the honey from penetrating the zinc, yet we would prefer not to use it even then.

Do barrels need any inside preparation for storing extracted honey?

It always pays to coat barrels with wax or paraffine before putting in honey.



Will a case of sections between the brood-chamber and upper storey act the same as a queen-excluding honey board?

No. We prefer the queen-excluding honey board when sections are placed on the brood-chamber.

After extracting, if I find I have extracted too much thin honey, will it do to evaporate it over the stove?

If your honey is thin when extracted you may ripen it. Allow the thick honey to settle to the bottom of a deep tin. Take the thin top honey, placing it in open vessels, and set in water just below the boiling point. If not too thin, putting in very warm room, in which the sun can shine and raise the temperature, will usually ripen it.

If there is no bottom piece on frames in upper storey, will bees attach combs to frames below?

We think it objectionable not to have a bottom bar on the frame for other reasons. Yes, they will frequently do so unless you use a perforated metal honey board between.

Will lard, pork or molasses barrels do to store extracted honey in if thoroughly cleaned?

We have thoroughly cleansed and scalded molasses barrels and stored honey in them, but usually lost too much by leakage. The pork or lard barrels are decidedly objectionable and not fit for use even after being scalded and thoroughly cleansed. Honey in such barrels would be looked upon with suspicion. After consideration we favor the 60 lb. tins with large screw tops. They are easy to liquify when the honey becomes granulated, easy to handle, of suitable size for selling, and almost any family can do with one. The advantages they have over the barrels give them the preference.

#### HIS BEST REPORT.

J. W. WHEALY.—As others are sending in their reports I may as well send in mine also. It is not much of a one, but like the old lady's cold "It's the best I've got." I commenced the season with bees in 49 hives, some were good, some very weak and the rest "all grades." I ran 38 for comb honey, and the rest for extracted. I think the extracted ones were rather stronger on the average. The comb honey stocks increased 25 and gathered 600 lbs. of honey. The extracted honey stocks increased one (by division) and gathered 170 lbs., both averaging between 15 and 16 lbs. per hive, spring count. The greater increase of the comb honey stocks was offset by the fact that a number of the swarms were short of stores. I had to feed about 200 lbs., and am afraid that a few of them

are yet rather short of stores. My experience this year is that if the increase be worth the feed, that the cost of raising comb honey is about the same as extracted. Of course another season might give different results. I got some of the D. A. Jones & Co's winter feeders to feed some of the light stocks. I tried three of them and stopped. One swarm refused to go into the business of winter feeding, a second got so excited about it that they used up what they had in the hive as well as what they had in the feeder and then starved. I can't get at the third without exciting three or four swarms on the other side of the passage who are always on the warpath at the least provocation, so I just let them take their chance. It is the first time I have tried winter feeding and I hope the last. I have been frequently asked by beginners "How will I get my bees to swarm." My experience this season enables me to give a better answer than I could have done before. Get a good strong colony of black bees of a good swarming strain. Keep them shut down in the brood-chamber until they begin to hang out, then give a large upper story without comb or fdn. to discourage them, and if they don't fill the bill they will make a very good attempt at it. Of course some will say that they have none of the swarming strain. Well I have, but don't intend to longer than I can replace the queens. If any one wants them he can get them cheap, for if I can't give them away I will kill them. I have always read that when a number of queens came out with a swarm, that swarming was done for that season, but I had some blacks that would send out a fresh batch of queens every day. I thought I would see how long they would keep it up but got tired of it before they did and stopped it.

Kintore, Feb. 6th, 1889.

We are sorry you had such bad luck with your winter feeder. You could not have prepared the food properly. The sugar should be thoroughly incorporated in the honey or water. If you had put a little water in the sugar and brought it to the boil, and as soon as the sugar was melted and enough of the water boiled out so that it would make wax which may be determined by putting a little on ice, and if it is hard enough it will break as soon as it cools, then lift it off the fire, after it gets perfectly cool, just before it gets too stiff adjust the shelves in the feeders and fill it full. This will feed an ordinary colony all winter and a great many have wintered as well with the winter feeder properly arranged, as they would on honey in the comb. We have had some very flattering reports from its use. Where the sugar is not properly dissolved they work out the liquid part allowing the unused to fall to the bottom of the hive, but if properly made no loss occurs.

## BUSINESS DEPARTMENT.

We are now prepared to take any quantity of wax in exchange for supplies. When shipping place your name on the package and advise us when sent.

### 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
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5 Bee-keepers' Guide, Prof. A. J. Cook, edition 1884.....	1 25	85
1 A.B.C., A. I. Root, edition 1883—a good deal worn.....	1 25	50
1 A.B.C., A. I. Root, edition 1883—good as new.....	1 25	75
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