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THE BEE-KEEPERS' REVIEW

VOL. I.

FLINT, MICHIGAN, APRIL 10, 1888.

NO. 4.

The Best Management for Spring—Much Depends upon Circumstances.

R. L. TAYLOR.

The question of the best system of management for securing as early as possible a strong force of bees to be ready against the first flows of nectar is to me a very puzzling one. It is one thing to give a good method and quite another to say with a feeling of certainty what is the best method. For there is not only the question of actual results, which is comparatively simple, but there is the troublesome though all important one of comparative expense and that not in the abstract but in connection with comparative results. The greatest actual results do not prove the method of management by which they were produced to be the best. Time, and labor, and thought, and care, and material, and capital, are all money, so the greatest result numerically may be obtained at a loss while the least apparent result may yield the greatest net profit.

Then again the labor supply greatly complicates the problem. One may command enough without other expense than a fair payment for the services, while another must lose time and be at other expense, and undergo vexation to secure labor competent to perform the critical work required for the proper manipulation of colonies to obtain an early and rapid increase of brood, and besides be obliged to pay a high price therefor. One whose time is at his command and the numbers of whose apiary are such that he can perform this labor himself may adopt a method which one differently situated could not possibly entertain. But these are points which every one must decide for himself with reference to his own circumstances after becoming acquainted with the requirements of the several methods.

So far as I have been able to determine from actual experience, the most successful, the most effectual and the most desirable way to be certain of having colonies well prepared for the harvest is to have strong colonies in April—of course I mean strong for the season—and then leave them, disturbing them no more than is necessary to be assured that they have, at all times abundant stores. Such colonies thus treated will secure a good amount of surplus in the poorest season I ever experienced. I once thought I wanted colonies only very moderately

strong with which to enter the winter, but I now think differently, not because I believe very strong ones will winter any better but because I want them very strong as soon as the winter is past.

To secure this character in as large a proportion of one's colonies as possible, care must be taken the previous summer and autumn. Good queens and enough room for breeding purposes from the first of August will generally accomplish it. After contracting during the early honey season nothing furnishes the additional hive room necessary so admirably as the adding of a second section of the new Heddon hive filled if possible with comb. In this way but little manipulation or care is required during the entire season and with successful wintering a good crop is almost assured. No packing, or at least the simplest kind, is needed because the quantity of bees is such that their animal heat easily keeps up the temperature required for brood rearing. It may be objected that such colonies are unprofitable because they consume so great quantities of stores. But it will be found that such colonies are seldom short of stores after bloom appears. The maples and the willows yield honey, often in abundance, and these strong colonies have a surplus of bees to gather it, while in those less strong the bees are mostly required at home to keep up the temperature of the brood chamber, so their stores are constantly diminishing.

I have never yet been able to bring myself to believe that it is profitable to provide outside boxes specially for spring packing. The first expense is the least. There are also the packing material, to be provided each season, the packing and the unpacking, the removal of the packing material, the care of the boxes and the room occupied by them and the inevitable litter, all of which make the burden unbearable where the colonies are numerous. And to my mind chaff hives are quite as objectionable. Of course these remarks apply only in cases where the bees are wintered indoors. I much prefer the following method: Confine all colonies not strong on the number of combs they can well cover between two division boards, or in the case of the new Heddon hive in a single section of the brood chamber, taking care that each has a liberal supply of stores to last till the next visit, then place an empty story above, put a piece of

burlap over the frames and cover that with chaff or saw-dust three or four inches deep, make the entrance quite small and leave them till the lapse of time requires another examination. Then from time to time add combs as needed inserted either in the centre of the brood nest or at the side of the cluster as good judgement may dictate, and in the case of the Heddon hive give a second section with combs when the first one is full. This I think will make about as much of the several colonies as is generally profitably possible. If healthy, a majority even of this class of colonies will be in fairly good condition for the harvest. Then a few days before the opening of the honey season select all the rest, that is that have not at least the equivalent of six Langstroth frames of brood, and unite in such a way as to give each new colony thus formed as nearly as possible the equivalent of eight Langstroth frames of brood.

To return to the subject of stores let me say that I have no doubt that a colony can be built up a little more rapidly by regular daily feeding than in any other way, but I am just as sure that the gain is got at a loss except to him who has few colonies and whose time is a burden. But with good young queens, plenty of good stores is the alpha and omega of profitable bee-keeping. How feeding shall be done is not so important as that it be done promptly. There is no better way than to exchange brood combs filled with honey if one has them for one or more of the empty combs in the brood chamber, and in the absence of such combs of honey, I much prefer to supply a threatened lack by putting enough at once in a feeder above the brood combs.

At the risk of repetition I shall close by saying that weak colonies never rear a large amount of brood; colonies with poor queens never rear a large amount of brood; colonies deficient in stores never rear a large amount of brood; so I would emphasize as the main elements of success these four things: Tolerate only good queens, keep all colonies strong, winter them well and have them always abundantly supplied with stores.

LAFEEER, Mich., April 4, 1888.

Spring Management.

OLIVER FOSTER.

It goes without saying that if we expect a large yield of honey we must have a large force of worker bees ready when the time for gathering it arrives.

Some fine scheming has been done with a view to having brood reared just in time for certain expected honey flows, and to suppress its production when it would mature later, but it is useless to try to be very systematic in this respect.

I never knew a colony to become populous too early, for if it swarms or is divided we have two instead of one when the honey comes, and if increase is not desired they may be united in the fall.

In view of the foregoing I would push forward brood rearing as early and as vigorously as practicable up to the height of the honey

season: after this the best judgment of the apiarist should be consulted as to whether what honey may be reasonably expected later, will justify his keeping up the full strength of the colonies.

In this locality but little can be done to improve upon the natural instincts of a healthy colony with a vigorous queen, aside from confining the animal heat, and keeping a supply of good stores on hand.

In early spring I aim to crowd the bees upon as few combs as they can comfortably occupy, if they are not already in this condition, as they should be if properly wintered.

In this shape the stores are necessarily limited, as most of the comb should be occupied with brood. So a close watch must be kept that they do not get short of stores, nor crowded for room.

Some authorities advise abundance of stores. I never could see that brood rearing progressed any more rapidly, other things being equal, with 20 lbs. of honey in the brood chamber than with three or four lbs.

Just when and how to add more room and stores, should be carefully considered. If we have combs filled with honey, they may be inserted, one at a time as they are needed. As this honey must be removed to the corners of the other combs before the added comb can be occupied with brood, and as it is expensive to keep a supply of these filled combs always on hand late in the spring when it may not be needed at all and cannot be otherwise utilized to advantage, I am inclining in favor of the feeding process, and, as I haven't the filled combs, I am preparing to use feeders on, or rather under, nearly all my colonies this spring.

Several years ago I practiced the method described by Dr. Miller of filling the combs with syrup. I abandoned it because it made such a daubing mess for the bees as well as for their keepers.

I once abandoned all feeding for stimulation, because the abnormal early breeding which it induced seemed to cause the bees, in great numbers, to fly after water when it was too cold for them to do so without heavy loss. The feed used was candy bricks of sugar, honey and flour, also thick syrup. Some one has said "stimulate with very thin syrup." I have "caught on" and am going to try it.

SPREADING THE BROOD.

The only benefit I have seen from this is that it keeps the bee bread at the side of the brood, where it should be, instead of between it, as we often find it where a queen spreads out rapidly in one direction. I aim to place the new comb between the outside one, which is occupied largely with bee bread, and the one next to it containing brood. This answers every purpose and does not break into a good queen's "order of exercises." Now all this applies to moderate colonies and for early spring. Later, and before the honey harvest, we need the full capacity of a 10 frame L. hive to hold the brood from a good queen and store enough to last over a rainy spell. Where I have a good strong colony on 10 combs with say 15

lbs. of honey and all right in early spring. I just tuck them up a little and leave them alone in this their best condition.

My hives are all single walled with no projections on sides nor backs. Those I winter in cellar I place on summer stands in clusters of four hives each, so that each hive is "packed" on one side and at the rear end with adjoining hives thus:



The colony is placed in the side toward the center of the cluster, and the "dummies" or division boards are placed next to the bees on the other side, and are shoved outward as new combs are added. The top story, furnished with a temporary bottom and the regular hive cover, is partly filled with chaff and placed over the brood chamber, which is thus protected on all sides except the front end, and is ready for our rigorous changes of April and May.

The rear ends of all these hives are raised one inch and the small space thus caused between the hives is filled with straw. When summer operations begin the hives are spread six inches apart each way. The stands are simply four pieces of fence boards 38 inches long, so arranged upon bricks that the ends of the two hives rest on a board.

MT. VERNON, LINN CO., IOWA, April 12, '88.

Securing Workers for the Harvest.

H. R. BOARDMAN.

"Go to the ant thou sluggard consider her ways and be wise." It is evident that Solomon had not given much attention to the methods of modern bee-keeping, or this little kernel of wisdom would have been rendered. "Go to the bee thou short-sighted bee-keeper, consider her ways and let your methods of management be in accordance with her wise instinct."

If I were to map out methods for the most successful spring management, I would advise beginning the previous season, soon after the close of the honey harvest, to make preparation.

The stores that are gathered during the summer, prepared with such precision, sealed and protected with so much care and in so perfect a manner, are for the development of workers for the coming harvest, and not for the use of the bees that gather and prepare it. Is it not the part of wisdom to be instructed by these suggestions, and lend our assistance to these our little industrious friends in making their preparations in their own time and way?

The measure of our success, in fact something of the methods to be employed in spring management must depend very much upon the condition in which the bees come through the winter. If the winter leaves them in good condition with abundant stores and a young prolific queen, we need have no fears for their future prosperity. The workers for the coming harvest will be abundant and on time, and much fussing, doctoring and vexation of spirit be avoided.

Some of the best and strongest colonies I have ever seen at the beginning of the honey harvest have been the result of the let-alone management.

It is useless to think of building up colonies in the spring and expect them to be strong and overflowing with bees at the harvest, without abundant stores. These may be supplied in the natural way in stores prepared by the bees in quantity sufficient for the season. Or we may pinch the bees through the winter on just enough to escape starvation and then supply them artificially with food from day to day to build them up. The latter plan I think is at best but short sighted economy. It is a fact that could not well escape the notice of any observing bee-keeper that those colonies having abundance of natural stores are the most quiet, and waste less of their vitality in useless activity in frequent flights, than colonies stinted in stores. If there is a particularly active colony in the apiary you will almost invariably discover it short of stores.

The methods that commend themselves to us as the most favorable are such as will preserve the vitality and prolong the lives of our honey gatherers and at the same time secure a moderate and uniform development of brood, rather than such as will excite and stimulate to rapid brood rearing, to be again wasted in useless activity.

I think it is an open question among our best apiarists as to the best time to set bees out of winter quarters in the spring. With me the successful wintering of all normal colonies from the time of setting them in until they are put out in the spring is attended with very little uncertainty. But I am compelled to admit that there are some seasons that I am not quite certain about the best time of setting out in the spring.

I find that it is no unusual thing, in colonies wintered inside, to find brood-rearing suspended from some cause after it has been well advanced, suggesting that the favorable conditions for breeding had been exhausted. These suggestions are further strengthened when, on setting out such colonies, the queen resumes laying and the normal conditions are restored. Those bee-keepers who report their bees always breeding up strong and filling the hives with brood until late in the season in confinement have been able to secure a very desirable condition; one which I am free to admit that I have not always been able to secure. It is my experience that with the average season brood-rearing will begin earlier with colonies wintered inside than with those on the summer stands, although this is not invariably so. It is desirable when once it is begun that it should be continued uninterrupted, and when I discover that breeding is being suspended I cannot feel satisfied to leave the bees long inside, but set them out, and after they have had a cleansing flight and quenched their thirst, which I suspect may be the principal cause of the interruption in breeding, I set back the light colonies if I think it too early for them to remain on the summer stands.

When bees are first set out they are usually strong enough, if wintered well, to protect the brood against serious injury for several

days of quite severe cold. The most serious results are to be feared from the brood being chilled late in the season when the bees have diminished and the proportion of brood is much greater and consequently much more exposed. I have no fears of serious results from cold on strong vigorous colonies at any season of the year, it is only those that are not strong and vigorous that give me the most anxiety.

It is a matter of economy then to have no light colonies, but we are compelled to accept things as we find them, and we find light colonies in the spring in most apiaries, and to care for such colonies is the part of spring management that causes the bee-keeper the most trouble. The use of the division board for such to contract the brood-nest, with natural stores placed back of it to which the bees have access, is undoubtedly among the best methods for building up such colonies; and if natural stores are not at hand, combs filled with sugar syrup, or honey may be used instead. I have never been quite able to understand why practical bee-keepers should advocate spreading the brood to induce extra efforts on the part of the queen. The very opposite practice, that of keeping the brood as compact as possible, has been much more satisfactory with me under all circumstances. Even when using the division board I prefer to add the combs, as they are needed, to the outside of the brood-nest.

To sum up the whole matter then, in order to have strong colonies overflowing with bees at the beginning of the honey harvest, have them strong and well provided when they go into winter. They will then usually come out strong in the spring, and build up and be strong for the harvest.

Strong colonies at all seasons are the key to success in bee-keeping.

EAST TOWNSEND, OHIO, March 31, 1888.

Importance of Abundant Stores—Keep the Bees in the Cellar as Late as Possible.

C. C. MILLER.

I don't know just the best way to get bees in most satisfactory condition for the honey harvest; but if I tell what I do know it may help. To begin with, I have had the best success with colonies strong and in good condition at time of taking their first spring flight. Understand I am talking about bees that have wintered in a cellar, for I have had no experience of late years in any other than cellar wintering. I have not observed long enough and closely enough to lay down a very positive rule about it, but so far as my observations have gone, they lead me toward the belief that of two colonies alike in other respects, the one having abundant stores on going into winter quarters, and the other having merely enough to pull through on, that the one with full stores will come out with the stronger force in spring, and this accords, I think, with the observation of others. So I like to have each colony have enough stores to last till the honey harvest, and to make sure of this it is best for them to have a little more than may be thought necessary. If sufficient was not given in the

fall, the next best thing is to furnish it as soon as possible after taking out in spring. It may seem that if a colony lacks two pounds of having enough honey to last till the harvest, that it can make no difference whether that honey is in the hive till the time actually comes when they need it, but from watching the bees I think it does make a decided difference. I don't know whether the bees reason that the supply "in sight" is abundant and that they can go in heavy on raising brood, or whether there is some other reason, possibly the honey filling up so much that would otherwise be air-space, said honey acting as an equalizer of heat. I like best to have on hand some sealed frames of honey to supply any needy colony. However it may be in other localities, I have found generally that with an excess of stores in the hive, eggs and brood will always be found in as large quantities as the bees can care for. So I do not resort to stimulative feeding, nor do I often meddle with the brood chamber in the way of spreading brood, although in some cases and places this may be done to advantage.

With a colony already strong, abundance of stores is of first importance, and perhaps being kept snug and warm the thing of second importance. With weak colonies warmth may be of first importance. I close in with a division board just what combs the cluster needs, and cover over with a quilt, generally made of cotton cloth containing several thicknesses of newspaper. Whether I would be paid for the extra labor of packing the hive in early spring I do not know. I have to some extent practiced putting two colonies in one hive, by simply putting a bee-tight division board in the middle of a ten frame hive, putting two colonies in this one hive in the fall, sometimes in the spring, and leaving them so till one or both colonies needed more than five frames each. I think they are thus kept enough warmer to pay for the trouble of changing, especially if one is weak, and in this case they can be nicely equalized, for in early spring a colony having only two brood combs will often have some of its brood chilled if a third frame of brood be given it, whereas in one of these double hives if one colony has five frames of brood and the other two, it is quite safe to take a frame of brood with adhering bees from the strong side and give to the weak.

I have fed a good many bushels of meal in the spring, and I suspect it helps in brood rearing. At any rate I have never seen any harm come of it and the bees seem very eager for it till natural pollen abounds, when all substitutes are abandoned. When I had only a few colonies I could not get the bees to work on meal, probably because enough pollen was to be found for so few, but with 100 colonies or more in one spot the supply is too limited, and a substitute is accepted. After trying several kinds of meal I have principally used, of late, corn and oats ground together. It may be no better than other but it was convenient to use just what I had for horse and cow feed.

As I have said before, I have often regretted taking bees in too late in the fall and out too early in the spring, but I never regretted

taking them in too early in the fall or taking them out too late in the spring. All spring dwindling ceases when the weather becomes sufficiently warm, and if bees could be kept contentedly in the cellar till the weather was warm enough would there be any dwindling? To help keep them contented through warm spells in spring, I open cellar doors and windows as soon as dark and leave them open next morning till bees get uneasy, sometimes till noon. Sometimes I have used ice.

MARENGO, ILL., April 7, 1888.

How to Have Colonies Strong in Time for the Harvest.

J. H. MARTIN.

On the morning of March 14th, after our great storm, eight swarms out of 61, on summer stands, were barely in sight, the rest were nearly all about five feet under snow. On the 27th about 20 had to be exhumed. I find that bees will, to all appearances, enjoy quiet and warmth under a huge snow bank if the weather is quite cold above. But just as soon as a thaw of many days duration sets in the conditions change, moisture will collect upon the hives, on the combs and the packing, mould will form and if too long endured, dysentery will weaken if not destroy the colony. After shoveling the bees to light they had a fine airing, the first since November, and nearly all answered the roll call.

My next step, if the weather continues warm, will be to examine the packing and remove all moist material and also remove all dead bees. They are then let alone until settled weather comes to stay, and pollen begins to come in. The bees in the cellar are then placed, a few at a time, upon their summer stands. I now go over every swarm and find the amount of brood, bees and honey, and the condition of the queens: making them as comfortable as possible and furnishing every condition for the rapid development of brood: all swarms that are very weak, but have good queens, are doubled with some stronger swarms that have lost their queen, or have old queens. After this examination I let them alone for ten or twelve days: I then look over my strongest colonies which have been previously marked. If they have begun to increase in numbers so as to cover outlying combs, I spread the brood and insert a nice frame of worker comb. I carefully watch these colonies and continue to force them along as rapidly as possible until each hive is full of bees and several combs in which is brood hatching. I then draw a frame of hatching brood from the strong and give it to the weak swarms. These weak ones have in the meantime been nursed along and are getting quite independent, and a frame of hatching brood gives them a big lift toward prosperity. In taking brood from the strong swarm I am careful to select a comb from which a portion of the young bees have hatched, for if I take solid brood every time I am liable to weaken the strong colony. In this way I fit all colonies until they are all equally strong.

If every swarm came through very strong, occupying five or six ranges of comb, per-

haps the let alone policy would work well, but even then I think forcing along moderately would give us colonies that would swarm earlier and thus secure a better honey harvest.

It has not been my good fortune to winter bees so successfully but that a large number of colonies are weak. A few years ago nearly all were only able to cover two or three combs. From appearances I was to get no honey that year, but by careful management, spreading the brood and equalizing, I obtained a bountiful harvest and a good increase.

There are many who advocate the repressing of early brood rearing. When I set my bees from the cellar the last of April or first of May and find hives in which a good start of brood is found, I have no fears that such swarms will spring dwindle, while those that have no brood will require much care to bring them to flowers. Early brood rearing means early swarms, and colonies ready to swarm early means tons of honey if the flowers secrete it.

I have never practiced feeding to secure workers, with the exception perhaps of uncapping a frame of honey and inserting in or near the brood-nest. If there is plenty of honey in the hive and the proper warmth the queen will lay as rapidly as if fed every day. Keep the brood nest warm, and a rapid increase of bees will surely follow.

For early brood rearing I would prefer a deep cellar under a dwelling. The room in which the bees are stored should be in size according to the number of swarms to be wintered, and they should be placed in close tiers. The natural heat of the bees will keep up the temperature of such a room to the proper point, and when the door is opened the room will smell like an individual healthy swarm of bees. Proper ventilation should be provided and a little humidity would be beneficial. With these favorable conditions brood rearing would commence whenever the temperature was raised, and if there is plenty of healthful honey and pollen I think there would be found more or less brood all winter.

Perhaps Bro. Bingham's experiments in wintering in a light cellar will also aid us in solving this problem of early or late brood rearing.

HARTFORD, N. Y., March 29, 1888.

Care of Bees in Spring.

JAMES HEDDON.

It seems almost useless to write an essay on the above subject, as so very much, comparatively, depends upon how the bees have wintered and upon the season, particularly the spring preceeding the honey harvest in question. We will pre-suppose that our bees have wintered usually well, and that the colonies are of average strength, having fertile queens of ordinary prolificness.

To begin with, if the bees were wintered in a repository, do not take them out before outside colonies are gathering pollen freely and the chances of "squaw winters," or I might say, the echos of the preceeding winter are past. If the colonies are in 8 or 10

frame L hives, or hives of similar size, contract them to a little larger capacity than what is actually needed by the brood and food which they contain at the time. I need not say, for you all know, that I prefer the horizontal contraction which is only afforded by my divisible brood chambers. Right here I may as well say that I disagree with our able editor, whose opinions on bee matters in general, I hold in the highest esteem, with regard to packing these bees for conservation of spring heat, provided they come from the repository in good condition. But as he may be right, in this matter, I will supplement him, by saying, that if you do pack them, do not have a space greater than two inches, either at bottom, sides, ends or top, and fill this with something as solid as dry sawdust, firmly packed into the spaces. If chaff or leaves must be used, try to make the packing solid, by compression, so that the filled walls may be slow conductors rather than almost perfect non-conductors, and by all means have the outer box painted very dark color. English venetian red, with lampblack mixed in, makes a cheap and most durable paint of the right color.

Next see to it that as soon as the queen can use more room, that it be given. If suspended frames are used add them; if the new hive and system, add another brood case, and this may be placed under the one occupied at the time, and so no bad results can possibly follow from chilling any of the brood by adding extra room, even if the bees are removed from the packing at the time, which may or may not be advisable, according to season and conditions. It is supposable that the stocks have plenty of stores if they are not getting any from the fields. If not they must be fed for they consume considerable honey, when they are breeding as rapidly as they will under the conditions above named. Keep the hives subject to all the sunshine, and as little wind, as possible. As we never have a dearth of pollen here, I came near forgetting this important factor. Pollen is the nitrogenous food which must be had to promote growth of animal tissue, and if the combs do not contain an ample amount in your locality, feed flour as directed in books and journals devoted to our chosen pursuit. This the bees must have, in plenty, if best results are realized. What I have said about packing, is equally applicable to colonies which have been wintered out doors, whether in packing or otherwise.

DOWAGIAC, MICH., April 11, 1888.

The "Let Alone" Plan.

J. H. ROBERTSON.

When our bees have received the thorough care necessary to successfully winter them, no spring management has ever given us so much satisfaction as the "let alone" plan. If left in the bee-house until all danger of severe weather is over and soft maple in bloom, but little more work is required than to keep control of robbing and see that each colony has a good supply of stores.

PEWAMO, MICH., April 3, 1888.

The + Bee-Keepers' + Review, PUBLISHED MONTHLY.

W. Z. HUTCHINSON, Editor & Proprietor.

TERMS:—50 cents a year in advance, two copies for 95 cents; three for \$1.35; five for \$2.00; ten or more, 35 cents each; all to be sent to ONE POST OFFICE. In clubs to different post offices, NOT LESS than 45 cents each.

FLINT, MICHIGAN, APRIL 10, 1888.

SMALL PACKAGES FOR COMB HONEY.

Mr. Root illustrates and describes in Gleanings some small sections very ingeniously made by a Mr. Harmer from coarse pine shavings. We would not say one word to discourage anything that promises to help make a market for honey, but the fate of the half-pound section ought to be a warning upon this point.

OPEN-SIDED SECTIONS.

We have never used this style of sections for the simple reason that we could see no advantage in their open-sidedness, but could see that an aggravating amount of care must be expended in putting the last section into a case or crate in order to avoid the catching of corners, and that the angles formed by the side slots give a greater opportunity for propolisation, while these same angles in the edges of the side bars make the removal of the propolis a tedious task. Our correspondent, Mr. J. H. Robertson, has used 1,000 open-sided sections, and is thoroughly disgusted with them. He says the bees often extended their combs through the side openings, thus connecting adjoining sections.

APICULTURAL STATISTICS.

Mr. Root has inaugurated in Gleanings a system of gathering information in regard to bee-keeping, that promises to be of the most value of anything yet attempted in this line. He has five correspondents in each of the important honey producing States. As nearly as may be, these correspondents are located as follows: one in each corner of a State and one in the centre. These correspondents report at stated intervals, and these reports go fresh to the readers of Gleanings. A year or two previous to beginning the publication of the Review we had in mind a similar scheme that we hoped to put in practice after the Review should have become fairly started, perhaps at the opening of the second year, and it was a little hard to

see the plan adopted by another paper before we were prepared to bring it out, but we presume Mr. Root has saved us a vast amount of hard work, and perhaps our energies may do fully as much good if otherwise employed. Our proposed plan of securing statistics was to secure, as far as possible, a correspondent in each county, of all the important honey producing States and Canada, and then tabulate the reports. This would give a more complete and reliable report than the plan adopted by Mr. Root, and we may yet put it in operation.

PROPOLIS AND CLOSED-END FRAMES.

We are always glad to have the REVIEW criticised and shall ever strive to profit thereby; therefore we have to thank Mr. Root for his remarks upon the above subject in *Gleanings*. He thinks we were over-sanguine in our explanation of the facility with which closed-end frames might be handled in the Heddon hive. He admits that the end bars can be slid down by the side of the frame already in the hive very nicely until they are covered with the propolis. We have kept bees in the Heddon hive during the past three years, using from ten to seventy-five hives, and have experienced no trouble from propolis. But Mr. Root says that in Medina, in a single season, the bees gather propolis in such great profusion, that the sliding of one frame against another will catch bees by the legs and kill them. As those parts of the frames that come in contact when being handled are entirely protected from propolis, it will require a more complete explanation to enable us to fully comprehend the matter. Of course a little propolis may, by handling the frames, become daubed upon their points of contact, but to attempt to make a point out of this appears to us like a case of "straining at a gnat."

And now while the propolis question is up for discussion, we wish to call attention to what appears to us like an inconsistency upon the part of Mr. Root. A few years ago we endeavored to inform the readers of *Gleanings* in regard to the excellencies of the old style of Heddon super, but Mr. Root brought up this same propolis objection, saying that the bees would daub the top and bottom bars all over with propolis. He is now making, selling and advising the use of a T tin case, a most excellent case, by the way, but one in which the top and bottom

bars of the sections are exposed the same as in the old style of Heddon case. How about the propolis now, Bro. Root?

MENTIONING WHERE ADVERTISEMENTS ARE SEEN.

In answering an advertisement the writer always confers a favor upon both the publisher and advertiser by stating where the advertisement was seen. The advertiser wishes to know which periodicals are the best advertising mediums; so strong is this desire that some advertisers have offered a small present to each customer who would, when sending in his order, also mention where he had seen their ad. That it is a benefit to a publisher to mention his periodical when answering an advertisement found in its pages needs no discussion. In order that their readers may not neglect this point, some editors append to each advertisement the following legend: "Please state where you saw this advertisement." We notice that the A. B. J. has of late adopted this plan, and we were not long in discovering that it had its effect. Three-fourths of our customers, who now mention where our ad. is seen, state that they saw it in the A. B. J.; whereas, previous to the adoption by Mr. Newman of the plan mentioned, the A. B. J. received credit for only about one-third of the replies. *Gleanings* probably has as large a circulation as any bee-paper, yet but few, comparatively, of those who answer our ads. say they were seen in *Gleanings*. Why is this? Is it because Mr. Root does not ask his readers to mention *Gleanings* when writing to advertisers? Or is it because many of his readers are not really bee-keepers but take *Gleanings* for the interesting matter that it contains aside from bee-keeping, while the subscribers to the A. B. J. are all bee-keepers? Let no one imagine that we do not consider *Gleanings* an excellent advertising medium, but we have noticed the peculiar fact that we mention, and feel certain that its editor will have no objection to its publication.

We respectfully ask all to mention the REVIEW when replying to ads. found upon its pages.

HIVING BEES TO BE THE SPECIAL TOPIC OF THE MAY REVIEW.

This may seem a narrow subject for a special number, but a little thought will show that it allows a comparison of the methods resulting from clipping the queens'

wings with those where the queens are allowed to join the "throngs innumerable." It will also allow us to discuss the merits of the drone trap as a queen catcher, Mr. Cheshire tells us that it would be possible to develop a practically, non-swarmling strain of bees, while Mr. Simmins assures us that by following his instructions swarming may be prevented, but at present, when employing the methods now in vogue in this country, the bee-keeper who raises comb honey must encounter the problem of swarms and their management. With a few colonies the problem is far from weighty, but when the apiary is large and swarms come thicker and faster, the factors in the problem are rapidly increased. One day last summer Mr. J. H. Robertson had eighteen swarms in the air at one time. Even a veteran might be excused, if such a sight quickened his pulses. We may as well explain right here how this "snarl" was managed. The queens were secured, either in drone traps or by catching and caging them. (They were clipped.) The bees clustered in great gathering bunches upon one tree, from whence they were scooped off and hived, dividing them up as equally as possible and giving a queen to each division. When the queens are not allowed to accompany swarms, it often happens that several of the latter will unite in the air, and when returning the bees will "follow my leader;" that is, the hive which the bees first begin to enter usually secures the bulk of the bees. Mr. Robertson divides up such a union of swarms as follows: When the hive is full, cases of sections are taken from the hives from which the swarms have issued and placed upon the hive to which the bees are returning. When the bees are all in and the cases crammed full of bees it is an easy matter to divide them by simply carrying the cases of bees and placing them over the hives that we wish them to occupy. We once opposed the clipping of queens' wings, but as our colonies increased in number so did the trouble from swarms uniting; we also lost a few swarms by their absconding, and it really seemed as though we were compelled to resort to clipping. Now that we have learned more perfectly how to manage swarms with clipped queens we must say that we prefer to have our queens clipped. It gives us a control over the bees that can be obtained in no other way, unless it is by the use of drone traps. We shall be glad to

hear from those of our readers who have had experience in hiving swarms, especially in large apiaries; and, although we favor "clipping," we shall do our best to have the subject impartially and fairly discussed.

SPRING MANAGEMENT.

In his excellent article in this issue Mr. Taylor gives utterance to a truth that has, we fear, received far too little heed, viz.: "The greatest actual results do not prove the method of management by which they were produced to be the best." Many beekeepers have fallen into the habit of thinking that the greatest possible yields of honey are always desirable, and, still worse, some of them believe that the largest yield per colony is the great desideratum. All products are the result of labor and capital, and which is the more expensive factor should be well considered. In bee-keeping, capital is the less expensive factor, and should be substituted for labor when possible. Mr. Geo. Grimm, who keeps about 100 stocks of bees, tells us in *Gleanings* with how little labor they are managed. He says: "I believe that all the work that I do in the apiary in a year would not make ten full days." And yet he has sold \$400 of honey in one season from seventy-five colonies. This might be called financial bee-keeping. If by certain manipulations the bees of one row of hives are enabled to greatly increase the results as compared with a similar row of unmolested colonies, it does not necessarily follow that this plan of manipulation is the most profitable method of procedure. Simply increasing the number of colonies in the apiary might be much more profitable. Bee-keeping ought to be viewed in a broad light. The question is something like this: Here is an area of honey producing flowers, how shall we secure the nectar with the least expenditure of capital and labor? We must not forget, however, that many beekeepers are not able to combine labor and capital in those proportions that would be the most profitable. In many instances they are possessed of a fair share of the former while the latter is far from burdensome. In such instances even a large yield "per colony" might be desirable, although obtained at the expense of considerable labor; but we feel certain that a different policy must be employed where one wishes to profitably secure all the nectar within the radius of bee-flight.

Looked at from the standpoint which we are now occupying, it will be seen that the best spring management depends very much upon circumstances, that each one must decide for himself whether to pack the bees in spring, whether to manipulate the combs a la Doolittle, or to practice the "let alone" plan.

It has been said that "the best protection for bees is bees," and some of our correspondents seem to imply that they may be the cheapest. We do not believe that a normally strong colony of bees can best be protected by the addition of more bees. We believe that a covering composed of some non-conductor of heat is not only cheaper but better than a crust of living bees. We must admit though that the packing and unpacking of 300 or 400 colonies in the spring is quite a task: not so great though as it seems when everything is properly arranged; certainly no more than where they are packed in the fall, left out all winter and unpacked in the spring. As Mr. Boardman says, the danger of loss is not when first set out, but later, when the combs are filled with brood. Both Mr. Boardman and Mr. Taylor prefer strong colonies in the fall that they may be strong in the spring, and the latter calls attention to a point well worth consideration, viz.: these populous colonies are often able to gather considerable honey in early spring. Spreading the brood and stimulative feeding receives but little encouragement, in fact, as Mr. Boardman says: "The methods that commend themselves to us as the most favorable are such as will preserve the vitality and prolong the lives of our honey gatherers and at the same time secure a moderate and uniform development of brood, rather than such as will excite and stimulate too rapid brood rearing, to be again wasted in useless activity." It is pleasing to see how nearly unanimous all are in regard to the importance of abundant stores. The taking of combs of brood from strong colonies to build up weaklings is a practice we cannot recommend. We agree most heartily with Mr. Taylor's closing sentence: "Tolerate only good queens, keep all colonies strong, winter them well and have them always abundantly supplied with stores." Weak colonies we would furnish with stores, tuck them up snug and warm, and then let them alone, disturbing them only as it becomes necessary to give more room. No amount of fussing with them will prove profitable.

BEEES AND BEE-KEEPING—VOL. II.

(Continued from the March No.)

Chapter IV. takes up the subject of "Natural Increase." The first few pages of this chapter are really beautiful pen-picture descriptions of the wonderful processes that lead up to and include natural increase. No bee-keeper can read them without finding himself among the hives with the music of swarming bees in his ears. Mr. Cheshire inclines to the belief that the ringing of bells indulged in by old-time bee-keepers was not without its effect. The noise thus produced drowning the flight-note of the leaders and producing confusion. He advises shaking swarms into an empty hive, or "skep," covering the mouth with a towel to retain the bees, and then shaking them at the mouth of the prepared hive. A clothes basket having a cover of burlap sewed fast at one side would be more convenient. Our apiary is upon a smoothly mown lawn, and we have never found it necessary to spread down sheets or papers when hiving swarms as is recommended by Mr. Cheshire.

There is another recommendation to which we most strenuously object, and that is the giving of a comb of unsealed brood to a swarm "on roving bent." We have had this fail so repeatedly that we are inclined to the belief that it has an opposite effect from the one desired. The Author thinks that the clipping of a queen's wing is not prejudicial, but that "our knowledge now of the principles by which swarming can be controlled make the process of so little service that its disadvantages quite outweigh its benefits." He next describes drone-traps, but thinks they "are more likely to suit the tastes and needs of the amateur than to find favor with those who look to honey production as a serious matter." Some bee-keepers in this country who produce honey upon a large scale practice clipping the queens' wings, and still others use drone traps for catching queens when the swarms issue. The former practice is less expensive, while the latter saves the trouble of watching for and catching the queens when swarms issue. Speaking of the piping of queens Mr. Cheshire says that the sound is not produced by the wings nor by the breathing tubes. He believes it to be the effect of "stridulation" resembling that of the ant. He says that many insects are favored with natural musical instruments, formed of hard, wrinkled surfaces, denominated "stridulating organs." He describes

and approves of the "Heddon method of preventing after swarming." He thinks, however, that a neater plan is that of giving a fertile queen to the parent colony. A colony at this time does not need a fertile queen, and, in our experience, the giving of one does not always prevent swarming, although it may delay it until a second batch of cells is built.

Chapter V. has for its title, "Artificial Aids to Comb Building." The most ancient method of controlling the position of combs was that of fastening straight pieces of comb along the under side of the top bars; then followed wax guides, and Mr. Cheshire gives some illustrations showing how a neat strip of projecting wax may easily be run along under the top bar, thus furnishing a starter. Next follows a history of the discovery of comb foundation, a description of the different foundation machines and their merits; of wiring frames, etc., etc., with all of which most of our readers are familiar. In speaking of heavy foundation as compared with the light, the Author says: "Five square feet to the pound gives no greater aid to the bee than that little more than half its thickness. The excess of wax the former contains may be, and is generally, of service in adding solidity during drawing-out, but it remains in the midrib, where it is rather a disadvantage. Strict economy is inconsistent with the use of this heavy foundation, while that of lighter make (seven feet or thereabouts to the pound), aided by my fixers or any of the plans indicated, will yield combs which leave nothing to be desired." Foundation ought to be so placed in the frame that the side walls of the hexagons are in a perpendicular position, as this position gives the greatest possible resistance to downward strain.

In chapter VI., "Controlled Increase" receives a most thorough discussion. We cannot, however, agree with the Author when he says, in his opening paragraph, that but few bee-keepers allow natural swarming. We believe that the majority of apiarists in this country allow natural swarming. One objection brought by Mr. Cheshire against natural swarming is that the old hive is left so long queenless, hence a loss of bees. Swarming usually comes during the honey harvest when the rearing of workers means a lessened surplus; indeed some bee-keepers have practiced caging the queen during the honey harvest in order that brood-rearing

may not interfere with honey gathering. But when Mr. Cheshire says that by allowing swarming we thereby breed a strain of "swarmers" we agree most heartily. The queens of our most valuable colonies, those that attend strictly to honey gathering, piling up crate after crate of honey, but not swarming, the queens of these stocks, have left no progeny. This is a most powerful argument against natural swarming, i. e. unless we artificially rear queens from our best stocks and introduce them to the "swarmers." Different methods of transferring are next described, among others the one which Mr. Heddon first described in this country, calling it the "Modern" method. Mr. Cheshire says that a substantially identical method was practiced in England several years before Mr. Heddon made mention of it. We cannot help wishing that there were better methods of communication, in regard to apicultural matters, between this country and the old; as it sometimes happens that we never learn of valuable methods in use across the sea, until we have invented the same processes. The Author describes several methods of making artificial colonies. In speaking of selling bees by the pound, he calls attention to the difference in the weight of bees when filled with honey and when their honey sacs are empty. Bees of distinct races vary in weight. 10,200 bees, brought to starvation, weighed only one pound, while the larger of the dark-colored bees, gorged as at swarming time, weighed one pound per 3,000—the smaller, yellow races running up to 4,500 or even 5,000 per pound. Mr. Cheshire calls the prevention of swarming the "bee-keeper's ideal." Hives, he declares, may, by their structure, aid or hinder the bee-keeper, but, by themselves, cannot secure the wished-for result. A colony with a queen in her first year, and having no drone comb, rarely swarms. The want of room is the major cause of swarming, but, to prevent swarming, the room must be given in advance. In working for extracted honey swarming is easily prevented. In his remarks upon the Simmins method of preventing swarming, the Author closes by saying: "Judged by the light of theory and old experience it promises great things to those raisers of comb honey who will carefully follow it." The last paragraph of this chapter contains an "evolutionary" idea worthy of consideration. It reads as follows: "In a state of nature, the swarming

instinct is an essential to the maintenance of bee-life. Under domestication this is no longer true; so that we may safely seek to eliminate the instinct, and so not only come to possess a non-swarming system, but a non-swarming bee. The method of operation is purely a question of queen-rearing, which must next engage our attention."

Chapter VII. deals with "The Raising and Introduction of Queens." All larvae, says the Author, when they leave the egg receive from the nurse bees a secretion, which is truly a milk, from the gland carried in the head, and which, in the nurses, is extremely active. The drone and worker larvae are finally "weaned:" pollen, honey and water being substituted for the "milk." Worker larvae are weaned younger than are the drone larvae. Practically, queens are never weaned, but receive a copious supply of secretion diet from the beginning to the sealing of the cell. The so-called "royal jelly," then, is given to all bees alike at their birth. The rearing of drone-brood is more expensive and exhausting to a colony than the rearing of worker-brood, while the rearing of queens is not within the reach of little weak lots of bees. The rearing of queens by simply removing a queen from a colony is objectionable, as the bees in their haste to replace her select too old a larva. The larva should be intended for a queen from the very beginning. The proper way to rear good queens is to remove from a strong colony the queen, eggs, and unsealed brood, giving the colony a comb of eggs from the best queen in the yard. The Author objects to the plan, recommended by Mr. Alley, of keeping choice queens in miniature colonies, for, judging by numerous well known analogies, if the queen be not in fullest activity, her eggs are less likely to yield highly prolific queens. We have found most convenient the plan advised of placing the queen cells between the top bars of nuclei, instead of cutting holes and inserting cells in the comb. Queens, between hatching and maturing, are great consumers of pollen, hence all ordinary nurseries are objectionable where queens are confined three or four days before being introduced. To increase the size of our bees has been considered desirable. *Apis Dorsata* has hunted up simply because it was large. This idea, says Mr. Cheshire, is simply folly. The smaller the creature, the greater, relatively, are its powers, both for a mechanical and a physiological reason.

Were a bee enlarged to twice its present size, its weight would be increased eight fold, and the wear and tear, which must be replaced by food, would also be increased eight fold, while the large size of the bee would not enable it to secure any more honey from a blossom. The only advantage would be in the larger honey-sac which would decrease the visits to the hive, but this would be more than counterbalanced by the fact that, with normal bees, eight independent gatherers would be at work simultaneously for only the same wear and tear. Selection, which has gone on for ages, has given us a bee whose size yields us the best results. There is also a botanical objection to changing the size of our bees. Flowers and bees have been constantly interacting. "The build of every floret is adapted to that of its fertilizer, and could we suddenly increase the size of our bees we should throw them out of harmony with the floral world, decrease their utility, by reducing the number of plants they could fertilize, and diminish their value as honey gatherers." The Author again reverts to the advantages that may accrue from taking the rearing of queens under our own management, especially in regard to breeding out the swarming tendency. "The eggs furnishing queens, in the hands of the expert, are scarcely, in any instance, laid by a mother surrounded in her stock by the swarming fever: and since the mental conditions under which the eggs are laid are likely to reappear, this is of the highest moment." "But, it will be asked, of what certain advantage is selecting the queen if the drone is beyond our control? Much in every way, but chiefly that, in selecting the queen of the present, we select the drone of the future." The Author next calls attention to the fact that the drones are not entirely beyond our control. They may be secured abnormally early or late in the season: or the young queens and choice drones may be confined and then allowed to fly at such times as the common herd is in the hive. In regard to the fertilization of queens in confinement the Author thinks that, "however practicable it may be made, it can never be more than exceptionally applied." Under the head of introducing queens, the Author describes several cages and methods. In regard to the "law" which a correspondent of the *British Bee Journal* laid down, viz.: that bees that have been deprived of a queen and the means of rearing one for forty-eight

hours, will invariably accept any fertile queen, Mr. Cheshire says it is one that sometimes fails, but is "so far constant as to be of considerable value." This same "law" has recently been published in the C. B. J. The method of introduction that receives the most hearty support by the Author is the Simmins plan, which is described as follows: "Remove the queen from the hive that is to receive the stranger, placing the latter, at dusk, in a warm situation, quite alone, and without food, and so keeping her for thirty minutes. Then lift, at one corner, the quilt of the hive to which she is to be introduced, driving back the bees with very little smoke, and at once permit the queen to run down. Close the hive, make no examination for forty-eight hours, and leave the operation until so late that a lamp is necessary when the queen is introduced." Several excellent reasons are given why this method is almost universally successful, but want of space forbids their enumeration.

"The Apiary: Its Establishment and General Management." This is the title of chapter VIII., and our first criticism is upon the statement that the Author considers a succession of good honey-yielding plants preferable to one great breadth of an especial blossom. With us, one great flood of honey yields a surplus, when a succession of light yields does not. We know that Mr. Cheshire says "a succession of good honey-yielding plants," but this is well nigh impossible; so far as it is, we agree. The point we wish to make is this: A yield that only incites to breeding, or possibly a little more, is a detriment unless it is soon to be followed by a greater yield. We agree most perfectly, however, in thinking that, "devoting land to a honey crop is generally a doubtful investment." Mr. Cheshire says that hives should stand level. We prefer to have them slant towards the entrance, then water is never driven into the hives, at the entrance, to remain. It is that the hive may be slanted in this direction that we prefer to have the combs at right angles with the entrance. In speaking of house-apiaries, the Author says his own "long since came under the chopper." Considerable attention is given to the subject of feeding bees. The Author says that, intelligently managed, nothing does more than feeding, in an uncertain climate like his, to increase the bee-keepers' harvest. Sugar is the substance recommended, but it must be made into a syrup and some acid

added to prevent crystalization. Several styles of feeders are illustrated and described. The most of them are too small and furnish the food too slowly. We prefer a feeder from which a colony can take down ten or fifteen pounds in a single night. To secure the completion of unfinished sections and to supply needy stocks with food for winter are the only uses to which we ever put a feeder. The feeding of flour or meal in spring is fully described. Pea flour is preferable. Our locality furnishes an abundance of natural pollen as early as bees can fly. Spreading the brood is spoken of as being capable of accomplishing great things, but if prematurely or excessively practiced it causes nothing but loss. The Author does not advocate the forcing of late breeding. He says that "the effect of raising late brood is often as destructive as it is constructive; and sometimes more power is taken out of the old lives than is put into the new."

We had hoped to complete this review in the present issue, but there are so many valuable ideas in the remaining chapters—The Production of Honey; Wintering; Diseases and Enemies; The Chemistry of the Hive; Races; Calendar—that to do the subject justice it must be taken up in one more number.

EXTRACTED.

About Spreading the Brood.

The following article was published one year ago in *Gleanings*. Our greatest objection to the plan is the labor involved.

From several tests made by leaving whole rows of hives through the beeyard undisturbed, while a row alongside had the brood spread as about to be given, I find those manipulated gave results above the others more than double enough to pay for the extra labor. The trouble with most of those who try the plan for the first time is, that they begin to manipulate the brood too early. There can be nothing gained where there are three or four combs one-fourth full of brood, by spreading them apart and putting an empty comb between; for by so doing we simply spread the brood out in an unnatural position, and work on the plan of scattering the heat instead of concentrating it. Besides, as long as this state of affairs exists they have already got brood in more comb than they should have; for all will see that, if all this brood were put in one comb, and that comb placed in the center of a chaff hive made for only one comb, the bees that hardly covered it before

could hardly crowd into the space it now occupies.

To get at what I wish to illustrate, let us suppose that we could get that ordinary colony of bees with its brood in four combs as above, all on one comb, and no room for the bees except in this space, it will be seen that quite a proportion of the bees would be obliged to cluster outside. To obviate this outside clustering we would enlarge our hive so as to take one more comb, which comb is put in. Now having our heat and bees condensed to the right proportion, we would find that the queen would lay in this comb at the same rate she would in July, filling it with eggs in three or four days; while, had we not done this, the brood in the four combs with a whole hive to carry off the radiating heat would not have advanced to the amount of one-sixth of a frame. In a few days, more young bees from our first frame have hatched to such an extent that they are again crowding out at the entrance, when we once more enlarge the hive and put in another comb (putting it in the center this time), which is filled as quickly as before, and so we keep on, till our hive is enlarged to the breeding capacity of the queen. Does any one doubt but that we shall have a hive full of brood and bees long before we should if nothing had been done? If such doubt exists, an experiment or two along that line will convince any.

Well, now to practical work. As soon in spring as the first pollen appears, shut the colony on to the number of combs containing brood, using something to confine the heat as much as possible for a division-board. If these combs of brood do not contain honey enough, use a feeder such as I described a few months back for that division-board, and feed, or leave combs of honey beyond the board so the bees can have access to it. Now leave them till the two central combs have brood clear down to the bottom outside corners of the frames: for manipulation previous to this would not help a bit, as they already have all the chance for spreading their own brood that is needed. As soon as you find the two central combs thus filled, reverse the brood-nest, by which I mean put these two central combs of brood on the outside, and those outside in the center, when, in a very few days, we shall have our combs and colony in just the shape of the supposed colony we spoke of above, and are to proceed in the future on the same plan.

G. M. DOOLITTLE.

BORODINO, N. Y., April, 1887.

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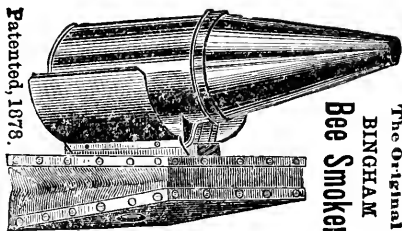
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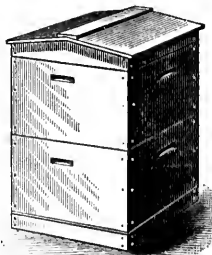
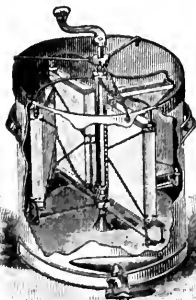
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THE BEE-KEEPERS' REVIEW

VOL. I.

FLINT, MICHIGAN, MAY 10, 1888.

NO. 5.

The Hiving of Swarms.

R. L. TAYLOR.

In preparation for the hiving of swarms when the time for their issuing comes, while making an examination of the several colonies in my apiary in the spring, I seek out each queen and clip one of her wings if one be not already clipped. I find it quite an advantage to do this before young bees begin to hatch largely because then the bees are comparatively few and the queen is generally easily discovered.

Then in anticipation of the advent of the swarming season other preparations must be diligently attended to. Hives must be all ready for immediate use and in a cool shady place as convenient as possible to the apiary. If the apiary be large, three or four baskets will be necessary and a good supply of cages for the queens as they issue with swarms is indispensable. The cages I use differ from anything I have seen described and may be made thus: Take a piece of soft wood $\frac{3}{4}$ x 1 inch $4\frac{1}{2}$ inches long and with a $\frac{3}{4}$ or $\frac{7}{8}$ inch bit bore a hole through it from side to side so near one end as to leave at that end $1\frac{1}{2}$ inch of solid wood and cut the stick carefully and squarely in two through the center of the hole. Then enlarge the half circle in the larger piece by boring through it, (the stick) one or two holes with a smaller bit and smooth out with a knife. Also form a piece of wire cloth, four inches long and about three and a half inches wide, around a piece of wood $\frac{3}{4}$ x 1 inch, beat with a mallet and weave smoothly together where the edges meet, then withdraw the wood, and having pushed into one end of the wire cloth tube the shorter piece prepared as above, tack it firmly in place. Now push the longer piece into the other end of the tube for a stopper, and you have a cage always ready, convenient, safe and durable.

With these preparations all made I will suppose I am set to hive the swarms in a large apiary on a warm day in the height of the swarming season. Everything likely to be needed, including heavy wire hooks for suspending the baskets, a pair of large white cotton sheets and a lighted smoker, are at hand in the shade of a centrally located tree. It is nine o'clock, and a hive near by spurring forth excited bees indicates that work has begun.

With a cage in my hand I step to the side of the hive and watch for the appearance of the queen in front. In one or two minutes

she is seen climbing the blades of grass and trying to take wing. The open end of the cage, the stopper being withdrawn, is held immediately over her, when she at once enters and the cage is closed, placed in a basket and the basket hung by its hook in a tree out of the sun at a place where the swarm is likely to find the queen. I then take a new hive (how excellent is the new Heddon hive for the purpose!) to the one sending out the swarm, removing the latter from its place and turning it around, put the new hive where the other stood and change the section cases from the old hive to the new. In the meantime the swarm has found the queen and is soon clustered in the basket, when I pour the bees out upon the ground in front of the hive prepared for them and when they fairly take up their march for their new home I release the queen and see that she runs into the hive, because many of the bees will refuse to go in until she does. This is hardly done before another swarm issues. I cage the queen and arrange the hives as before, but the swarm, instead of finding the queen in the basket, begins to cluster at another place, so I at once remove the basket and hang it near that point and the swarm at once takes possession of it. Before this one it fully lived, another swarm is in the air, and by the time I have caged its queen it discovers her absence and is already returning as I place their new hive in position. I hasten the return by placing the queen at the entrance, and as soon as the bees are rapidly alighting I release and run her in.

It is now ten o'clock and swarming has fairly begun. Two swarms now come out almost at the same moment and unite in the air. I cage their queens but notice that the swarms are attracted by the commotion at the hive into which the last swarm was put and are already beginning to alight there. I push the queens into my pocket, snatch a sheet and the smoker, and spreading the former over the hive threatened with invasion, with a few puffs of smoke from the latter I drive away the flying swarms, when they begin to cluster on a neighboring branch of an apple tree. I at once put each queen in a basket by herself and hang the baskets together where the cluster is forming. Soon one basket has its share of the bees and I steal it away and hang it out of sight in thick foliage or set it in the bee cellar.

Now other swarms come out—five in pretty quick succession—so I take the other basket with the swarm and hang it in plain sight

on a branch favorable for holding a large cluster of bees and convenient for shaking them off. Here, attracted by the swarm in the basket, all swarms will for the present congregate. I now proceed first to cage all the queens out and all others as they come out and put them in baskets hung near the cluster or out of the way in the shade till wanted. Then as I have time I arrange the hives and hive swarms taken from the general cluster, giving each a queen till all the bees are distributed.

It would make a long story to recount all the expedients at times resorted to to induce the bees to assist in making their hiving easy, but the foregoing indicates the general method pursued. Sometimes a swarm will cluster out of reach from the ground. In such cases, if practicable, a basket with the queen is hung under the cluster near the ground and with a little shaking the cluster drops down, the queen is soon discovered and the swarm gathers in the basket, or, if more convenient, a pole is used with a hook for the basket, say twenty inches from the upper end. The basket is raised with the pole and held under the cluster while the latter is jarred off with the upper end of the pole.

With unclipped queens on a good day for swarms I should be almost in despair. I never had but one queen superseded that I thought was superseded on account of clipping, and she had all four wings cut off short. My queens are not superseded soon enough to please me. I find too many that are approaching three years in age.

I am looking for a better way of managing swarming. Will the queen trap help? Who can give us new light?

LAFERIE MICH. May 5, 1888.

Hiving Swarms.

JAMES HEDDON.

Pages, and in fact issues, of the REVIEW could be filled by one writer, who has hived as many swarms as we have, with valuable suggestions touching upon this topic, and as I hardly knew where to begin or leave off, I thought of the plan of having Mr. Stolley, who had successfully managed my apiary so many years, pen his first thoughts relative to the modus operandi of that work, as now carried on in our apiary; and below we submit it; and any valuable points which may be left out can be given at some future time.

It seems almost unnecessary to detail the mode of operation for hiving a single swarm of bees, for it is simple and well known.

The question is, how to conduct the hiving of the swarms of a large apiary, where the colonies number by the hundred, in the most effective and safest way. From the fact that we have a number of rather large apple trees in and near our yard, we find that one or two common step-ladders are indispensable factors.

Further, we have about 3 or 4 baskets which are each 8 inches deep, 18 inches wide and 3 feet long. The insides of these baskets are lined with cloth, and on one side of the top rim is nailed a piece of burlap which has at its opposite side and ends, pieces of wood fastened so that when the swarm is dropped

into the open basket it can be closed by flopping or throwing the weighted burlap over the same. These pieces of wood (weights) serve to hold the cover or burlap snug to the edges of the basket, hence no bees can escape, nor can they pull the cover down into the basket, by clustering thereon from inside.

It might be well to remark here that, if thin material can be had, say strips of wood two inches wide, $\frac{1}{4}$ inch thick and of the proper length, one may construct a hiving basket superior to the one just described.

The two end pieces are to be of sound wood $\frac{1}{2}$ inch thick, now take a piece of wire screen of proper length and width (3 feet by 2 feet and 4 inches) and nail the same to the edges of the two end pieces. Now nail the thin strips of wood from the outside of screen on to the edges of the end pieces, leaving spaces between the strips of about 2 inches. Tack or nail the screen from inside on to the wooden strips; supply both ends of the basket on outside with cleats as handles; put a burlap cover on in same manner as mentioned above.

This gives us a very cheap, light, strong, airy and easily operated basket.

Next we add to our equipment from 6 to 10 pails which hold, when full, about 5 gallons each. (We use emptied paint pails) which are stationed over the yard at different places and kept well filled with water, to be used as described further on. Now by adding a couple of good fountain pumps (Whitman's preferred) we are ready for all emergencies in conducting the hiving of an apiary numbering from 100 to 300 colonies, spring count.

The foregoing are the principal implements deemed, by us, necessary to insure safe and almost invariable control over our swarms.

We find it better that a swarm of bees should be allowed to remain in the basket in a shady place from 5 to 10 minutes after it has been taken from its clustering place. This gives the bees chance to re-cluster in the basket and also to cool off from former excitement, causing them to lay much better when thrown in front of the new hive.

Now we carry them to their new home, where every thing has been properly arranged, but before we release them we glance once more quickly over the whole yard and satisfy ourselves that no other swarms are out and in the air, for the attention of any such swarm would soon be called by the one just released and we would be obliged to ward off the intruding swarm. Now in case a swarm issues immediately after we dump the captured one (which often happens), if said swarm is not too close to the place where we are endeavoring to run the first one in, a fountain pump is set to work at once. At this point the importance of having an abundant supply of water placed as described, will be readily seen, for the work to be done, must be done at once. In using the fountain pump the operator should understand that charging right through the bulk of the swarm does not effect the desired result, but throwing the water alongside of outer edge of swarm will induce the same to move off in an opposite direction, thus any intermixing is invariably avoided. In case a swarm issues, say from the adjoining hive,

the pump of course would be of no use, for the distance between the two swarms affords no chance for any water operation, and the best we can do under these circumstances is to throw a large piece of burlap or any kind of cloth over the hive and the swarm we have just released. By this method the bulk of the first swarm is practically safe while whatever stragglers or flying bees there may be, will more or less join and lead off with the other swarm. When two, three or even four swarms issue at the same time, if not too close together, we again hurry to our pumps, and by judicious manœuvring and proper application of water, as described, we gradually succeed in coaxing each swarm into a separate place, thus making matters easy all around. But when there are a succession of swarms issuing at very short intervals, things begin to look critical and the moment has arrived when the operator should keep cool-headed and act promptly in the right direction.²

The plan we avail ourselves of is the following: As soon as we have the limited number of swarms in the air and can't afford new additions, we keep very close watch over the whole yard and look for swarms that are just starting. At this juncture we proceed at once toward such a hive, lift the surplus apartment off quickly and dash a quantity of water down among frames, bees and all. The effect is a most radical one, and no further anxiety on the part of the operator need be entertained, for that swarm will stay at home for a day or two at least.

Throwing water into the brood-chamber is absolutely safe and no detriment to the brood or bees whatever, for we must remember that the water so used, is, as a rule, warm, from being exposed to the rays of the sun for days, while it stands in the aforesaid pails, ready for business.

Once on a nice day in June, we had in the air 5 swarms out at one time, and succeeded splendidly in our attempts to keep them apart, but in less than 10 minutes 7 more swarms had made an effort to appear in full, but dosing them in time with water left everything quiet on the Potomac. — Try the plan and see for yourself.

Also if a swarm of bees is determined not to be hived, but the moment you release them all take wing and return to their former clustering place, just take your fountain pump and wet them thoroughly while they are yet in the basket, this induces them to stay where you put them.

However, if a number of swarms should become snarled up, we first endeavor to pick out as many queens as we can while the bees are still clustered: then divide the lot into as many equal parts as preferred, running them into separate hives, and we can soon tell by their actions where a queen is wanted. If possible, a queen is given them at once, otherwise they will soon leave the hive, and as a rule return to their former clustering place. In cases where they so return we investigate those hives where the bees are quiet, which indicates the presence of one or more queens. If they have more than one queen, cage them all except one. Re-hive the queenless part and supply it with one of those caged

queens, let loose among the bees, and with hardly an exception everything will be satisfactory.

When a swarm is hived we remove one or more surplus cases from the old hive to the hive where the new swarm is housed.

This mode of "setting over" the surplus cases induces the bees to feel at home in their new hive and also furnishes them, from the beginning, store-room for surplus honey. This we have practiced ever since I began with Mr. Heddon in 1883, and he tells me was practiced by him for ten years previous to that date.

Clipping the queens' wings, non-swarming attachments, and drone-traps, have so far failed to aid us. But who can tell what the future may have in store?

The foregoing is in accordance with actual experience, not pleasantry nor fallacious theory.

W. A. STOLLEY,

GRAND-ISLAND, NEBRASKA.

Eye Opener No. I.

A SNYDER.

I understand the REVIEW to be the substance of all the other bee-journals boiled down. Now, in boiling down anything, there sometimes arises a scum of impurities, and I propose to skim off this scum.

R. L. Taylor, in the REVIEW of March, 10, makes a strong case against planting for honey, but it all rests upon suppositions. Is there one bee-keeper who thinks that an acre of good bee-pasture produces only ten pounds of honey? Mr. Taylor says that the honey gathered from cultivated plants is not all profit, but it strikes me that it very nearly all is, as we have to have everything to run the apiary whether we get any honey or not. I also think Mr. Taylor is "away off" in saying there is only 2½ cents profit per pound in raising comb honey. Take, for instance, a colony that produces 200 pounds of honey, worth fifteen cts. per pound. According to his calculations there would be \$5.00 profit and \$25.00 expenses. Now, who will look upon this as reasonable!

Dr. A. B. Mason (and he is good authority) says that bees fairly swarm upon sweet clover and that his gathered, from that alone, fifty pounds per colony. Does not that sound as though it would pay to plant sweet clover?

The Indiana Experimental Station says it is valuable as food for stock if cut green. It has not proved so with me.

The experience of James Nipe is very peculiar. After sowing sweet clover and getting it nicely started, all at once it was gone. Now everybody knows that it is very hardy and will grow almost any where. He had one acre that lived and grew as high as his head and the bees worked upon it vigorously, another proof that it is worth sowing. He says, it would have been a damage to him if his seven acres of clover had lived: that bees need blossoms by the acre. Why, bless you, friend Nipe, can't you sow sweet clover, Alsike, Chapman honey plant, pleurisy root, buckwheat, basswood etc, by the acre!

Now comes Mr. Robert Shipman, who says one colony of his bees gathered seventy-two

pounds of honey in four days from Alsike.—He also says that alsike remains in bloom thirty-five days. Now who can say it won't pay to plant for honey!

And now Mr. Editor, its your turn. If you have no partner why do you say "we"? You say that about Pewamo, Mich. the sowing and pasturing of alsike results in a profusion of blossoms the entire season, yet you agree that it does not pay to plant for honey. In the "Extracted Department" Mr. York tells about securing twenty pounds of surplus per colony from alsike alone. Don't you think that pays?

Here in Albany Co. N. Y., we bee-keepers generally get more buckwheat honey than all other kinds combined; so much for buckwheat.

I believe that the more honey plants we sow the fatter will our pocket books become.

COEYMAN'S HOLLOW, N. Y. April 18, 1888.

Manipulation.

EASY AND PROFITABLE IN WELL ADAPTED
HIVES.

REV. L. L. LANGSTROTH.

Although I was present at the Detroit Convention of bee-keepers in December, 1885, where Mr. Heddon first called attention to the system of management with his "new hive" I heard him too imperfectly to get any adequate conception of his invention. My head trouble returning soon after, and lasting nearly two years, I lost all interest in bee-matters, and it was only in February last (my attention being recalled to this hive), that I was impressed with the idea that it might be a great step in advance, in practical bee-keeping. From the very start I saw that many abused the power of manipulation given by the Langstroth hive, because they failed to see that progress lay in reducing the necessary manipulations to a minimum. In the latest work of our honored Dzierzon, his wonderful acquaintance with the habits of bees, seems, to Americans at least, to be greatly wasted upon a hive and system of management which would make our honey cost more than it would sell for.

To manipulate with whole cases of frames instead of by single frames, seemed to me a very wide extension of the principle so much insisted on in my first work on bees, published in 1853, that a hive ought not to require one single unnecessary motion either for the bee or its owner.

Influenced by such considerations, I determined to see the actual workings of the Heddon hive in his apiary at Dowagiac, Michigan. As the weather on my arrival there was too cold to handle bees, I carefully studied the hive. From what I know of the habits of bees, and construction of hives, just as a short examination of a Munz hive shows me that it is worthless either for amateur or practical uses—so the longer I studied the Heddon hive, the stronger was my belief that it would accomplish what he claimed for it.

As soon as I could see bees handled in these hives, and could handle them myself, all my favorable prepossessions were fully

confirmed, and knowing how little I could count upon the continuance of health, I felt that in justice to the public, as well as to Mr. Heddon, I ought to put this opinion on record, by writing to some of my bee-keeping friends.

I think that no one who knows how I was deprived of the legitimate fruits of my own invention, will be surprised that I should feel it to be a positive duty to use what influence I may have among bee-keepers, to secure for Mr. Heddon both the honor and the profit to which he seems, not only to me, but to so many of our best apiarists at home and abroad, to be justly entitled.

SUUM CUIQUE—"TO EACH HIS OWN."

From my earliest recollections my dear father enjoined this as a sacred duty upon his children—and I believe that all who know what I have done and written in connection with bees, will bear me witness that I have not departed from the spirit of his teachings. It was this strong sense of duty to give honor to whom honor is due, which made me desire, even before I had any correspondence with Mr. H. about his hive, to go to Dowagiac and judge of it for myself. I will now describe some of the most important things that I there witnessed:

1. Before I saw the easy working of his frames (even in hives which had been occupied for several years by bees), with close-fitting uprights (I prefer this French term to our word, ends), I could not conceive how they could possibly be handled as rapidly or safely as the Langstroth frames. The propolis trouble alone seemed to forbid this. Judge of my surprise then to find, that by leaving no space for bees to get between the uprights and the cases holding the frames, and by keeping the touching surfaces of the uprights so closely pressed together by the thumb-screws, as to leave no joint open wide enough for bee-glue, he had actually reduced the propolizing propensity of bees to a minimum!

My knowledge of the trouble and delay in manipulating all the previous styles of close-fitting uprights, led me to think that it would be quite difficult to handle the H. frames. To find that I was mistaken on this point, was a greater surprise than the way in which the propolis difficulty was met. In handling Langstroth frames of the standard depth (and still more with deeper frames), bees are often hurt between the uprights and case—a thing impossible with the Heddon arrangement, while at the same time the uprights of his case—as they go down into the hive, when a frame is put back—only push the bees away instead of pinching them between their closing surfaces. When the Langstroth frames are put back, even by experts, it often happens that they must re-adjust the spacing, to get room for the last frame, whereas, the H. frames always go to their proper places. As a matter of fact then, the Heddon frames can be safely handled with more rapidity than any in previous use: thus securing all the advantages of close-fitting uprights without their old inconveniences.

2. I was actually charmed to see how quickly the queen can be found in this hive. There is really no place where she can hide behind

either the uprights of the frames, or on any of the frame pieces, or on the combs, which by a single inversion of their containing case, have all been made to completely fill the frames. Alarmed, now, by the introduction of both light and smoke into such a shallow case, she usually glides at once to the bottom-board to hide herself between it and the bottoms of the frames. If she does not show up when the case is lifted off, she can, as I have seen, be readily shaken out from such shallow and uniformly straight combs, so as to be easily secured.

To catch a queen with so little trouble, and with no danger of robbing, seems almost too good a thing to be believed, until it is actually witnessed, and the mere thought that such a feat is possible, must recall to many of my readers their weary queen-hunts, in the old styles of hives, under the broiling sun, and with the hateful annoyance of robber bees.

3. Another important feature in this hive is the remarkable rapidity with which the exact condition of affairs, in the brood-chamber, can be ascertained. In less time than is needed to remove and replace a single frame in other hives, a Heddon brood-section can be lifted off, and from its being shallow enough to allow a good view of the combs from both above and below, even without shaking out the bees, the quantity of brood and honey, and everything else essential to be known, having been learned by a few glances of an expert's eye, the section may be replaced before any robbing can be done.

4. The shape, size and lightness of the parts composing this hive, greatly facilitate all necessary manipulations in the apiary, and must therefore make it peculiarly acceptable to all who for any reason wish to economize their physical strength. A weak person who cannot handle many hives needs it, and the strong man also needs it, that he may make all his strength tell, in the management of the largest possible number of colonies.

5. The simple way of holding the frames so firmly in place by thumb - screws, admirably fits this hive for safe transport. I use the word transport in its widest sense, so as to include every movement of any of the parts of the hive, from the simple lifting off of a section, to the carrying of a hive with bees for any purpose, to any distance, however short or long. I have seen a frame filled with comb, tossed about the room, and thrown out of a second story window—also a whole section of such frames slid, and even kicked about a room, and all without any injury to the combs.

6. I am strongly impressed with the great advantages, which seem to me must certainly be gained by one of the leading features of Mr. Heddon's invention and system of management, viz: the divisible brood-chamber but as this is a point on which the season (April 17) gives me no opportunity to speak from actual observation, I relegate it to the many able beekeepers who can speak from their own experience, remarking only that when capacious brood-chambers and surplus apartments are desired for any purpose, they can all be readily obtained in the best form, by the Heddon hive and system.

7. Perhaps there was no feature in the H. hive which surprised me quite as much as the facility it affords for the use of the extractor. Indeed, when I first gave it my attention, I was so ignorant of its scope, as to suppose that it was a conceded point that it could only be used profitably for the production of comb honey! This is one of the points where I cannot speak from my own actual observation; but those in Dowagiac, who have had the largest experience, affirm confidently, that, in a given time, they can actually extract more honey by the Heddon system than they could with their Langstroth hives, and give these reasons for their belief:

Nearly all the bees can be easily shaken out of the combs of the extracting sections, and these quickly carried to a safe place, where the few bees not shaken out, will soon leave them. The eight frames of a section may then be turned out in a standing position upon a table by a single motion, their regular shallow combs uncapped with unusual rapidity, and all their contents extracted at the same time; and nearly all of this work can be done under cover. Need anything more be said on this subject, to those who have followed the tedious routine of shaking and brushing off the bees from each separate comb in the sun, and exposed to robber bees?

8. It need hardly be said to any good beekeeper, who has carefully weighed the above points in favor of the Heddon hive and system of management, how greatly it reduces in an apiary the liability of robbing. Those who have the Heddon hives will have no use for any bee-tent, when they can so easily find the queen, or can shake out the bees from any section when necessary, to examine it at leisure under cover.

In reading this enumeration of benefits to be had from Mr. Heddon's invention, it might seem that if I have not exaggerated them, any one of a number of them must be worth, to a person who handles many colonies, at least the price of an individual right to use his patent.

I can only say that I have sought to avoid all over-statements, and have, in addition to what I could see with my own eyes, questioned at much length some who have largely handled the Heddon hives, and have been from the beginning familiar with every step in the progress of his invention. I would therefore not be afraid to risk my reputation for sound judgment as to the great value of the forward step which he has taken, even if I did not know that my opinion accords so well with the experience of many who have had the opportunity to put the hive and system to the test of practical use.

It is proper that I should say before closing this article, that I have carefully examined the claims of the Heddon patent, and the reasons which have been thought by some to invalidate them. Neither my acquaintance with the literature of bee-keeping, nor my familiarity with our patent laws, nor any facts which have been alleged against the Heddon patent, lead me for a moment to question its validity.

History seems often to repeat itself. In my

own day, how often it was declared to be enough to invalidate the claims of the first person who had invented a hive, which commended itself at once to those most largely engaged in the production of honey — how often, I say, it was thought enough, to show that some one before me, had used a frame in a bee-hive. It mattered nothing that I never claimed to have been the first to invent a movable-frame — that my frame and way of using it were fully described, and that the few frames which antedated mine were of no practical account — still the attempt was for many years persisted in, (I sometimes shudder now at the bare recollection of those weary years) to persuade the bee-keeping public that my patent was invalid.

On all sides patents sprung up, using, but not claiming, the most valuable features of my invention, and one bee-paper, having then the largest circulation, went so far as to accuse me of perjuries, which, if committed, ought to have sent me, in my old age, to the penitentiary. Thus were the feelings of my wife and children outraged, and even where no credit was given to such atrocious accusations, many honest bee-keepers were so misled as to believe that they had a perfect right to the free use of my movable frames, or were induced to pay for infringing patents the money which would have provided amply for me and mine.

I do not think that the bee-keepers of this country will ever suffer a similar outrage to be perpetrated either against Mr. Heddon or any other honest inventor and benefactor.

Dayton, Ohio.

The Bee-Keepers' Review, PUBLISHED MONTHLY.

W. Z. HUTCHINSON, Editor & Proprietor.

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FLINT, MICHIGAN, MAY 10, 1888.

SPECIAL TOPICS FOR FUTURE ISSUES.

We presume many of our readers know of some topics that they would be glad to have made the subject of special discussion in some future number of the REVIEW; if so, will they kindly write us? To anyone whose suggestion we follow in this matter we will send the REVIEW free for one year. If already a subscriber the time will be extended one year. If two or more persons suggest the same subject, and the subject is taken up for special discussion, credit will be given to the one whose suggestion reached us first.

EDITORIAL PROBLEMS.

We were not long in learning that one of the problems confronting an editor is that of

trying to put a quart into a pint; but, this month, even our quart measure is overflowing. There is not even room to give a summing up on the hiving question; perhaps we are not yet ready for a summing up, as the evidence is not yet all in. We have several excellent articles on hand, among others, one from Henry Alley, upon "Swarm Controllers." We will try and squeeze some of these articles into the next issue, and, as June is really the swarming month with the majority of our readers, it may not be so bad after all.

SAMPLE COPIES.

Ever since beginning the publication of the REVIEW we have been sending out large numbers of sample copies. They have been sent with the hope that, as bee-keepers became acquainted with the REVIEW, they would also become subscribers. That this is an excellent method of securing subscribers is proved by the fact that, as subscriptions come in, it turns out, in nearly every instance, that the subscriber has been the recipient of one or more copies of the REVIEW. Our only object in introducing this subject is to explain that no pay is expected for these samples. Owing to that unjust law that enables a publisher to collect pay for his publication if taken from the post-office, even though the one who takes it has not ordered it, a few have feared, after receiving two or three copies of the REVIEW, that it was to be forced upon them, and pay collected. There is no such intention. Even though you receive a dozen copies, read them and be happy in the thought that they will cost you nothing.

REMOVING THE QUEEN NEAR THE END OF THE HONEY HARVEST.

In the January REVIEW we said, in our Introduction, that we should "turn our attention to the solution of the unsolved problems of advanced bee-culture." We believe that the above topic will come under that head, and that it is of sufficient importance to justify our making it the special topic for discussion in the June REVIEW. Some one of our prominent bee-keepers (Mr. Heddon, or Mr. Doolittle, or some such chap) has said that bees work in sections with the greatest vim when there is a laying queen upon the combs below, and so it has always seemed to us; but we must admit that our queen-rearing nuclei, which, of course, had laying queens but a small part of the time; always

stored what seemed to us enormous quantities of honey for the number of bees they contained. These nuclei were never hopelessly queenless, as when no laying queens were present, each always had either eggs, larvae, a queen cell, or a virgin queen. Mr. P. H. Elwood says that no system that he has ever tried has enabled him to produce so much comb honey, as that of making the colonies queenless sixteen or eighteen days during the honey harvest. In one sense, making a colony queenless has the same effect as contracting the brood-nest: that is, it restricts brood rearing; or, rather it carries the matter still farther, stopping it altogether. It seems to us, however, that, as the brood hatches, the cells would be filled with honey that would otherwise have been stored in the sections had the brood combs been kept full of brood; but it must not be forgotten that, as Mr. Cheshire says, the rearing of a bee costs a colony as much as the storing of four cells of honey, hence, it is easy to see that the restriction of breeding, near the close of the honey harvest, when the brood that is reared will not hatch in time to join in the gathering of the honey harvest, will, other things being equal, lead to an increased surplus. For the great mass of bee-keepers we believe that contraction of the brood-nest is preferable to removing the queen, but that such men as Capt. J. E. Hetherington and P. H. Elwood favor the latter plan is significant, and during the coming month we shall put forth our best efforts to learn all that we can in regard to the matter, and the results will be given in the June Review.

THE RELATIVE COST OF SMALL AND LARGE HIVES.

In order to maintain his point that large hives are preferable to small ones, Mr. J. M. Hambaugh, in the A. B. J., tries to show that small hives are more expensive to use, that they cost as much apiece as large ones, and he submits as evidence an extract from the reply of a supply dealer to whom he wrote for estimates on eight and ten - frame hives. The quotation reads as follows: "Eight-frame hives would be worth just as much (as ten-frame hives), as we do not keep them in stock. We would have to make them to order, and the extra trouble of making them would be worth all that we would save on lumber." It is evident that Mr. Hambaugh wrote to a manufacturer who does not deal in eight-frame hives, (they are only made to

order) but how would it have been had he written to a dealer who handled only eight-frame hives, (unless made to order)? The reply then would probably have read something like this: "We do not keep ten - frame hives in stock. We can, however, make them to order: but, as it will be some extra trouble to make them, will require more lumber, and that for covers (it being so wide) will cost an extra price, we shall be obliged to charge you about ten cents extra per hive." If a manufacturer makes and keeps in stock both eight and ten-frame hives, which, is it reasonable to suppose, he can sell at the lower price?

THE REVIEW REVIEWED.

Upon another page Mr. Snyder reviews the Review. We must admit that the article of Mr. Taylor on "Planting for Honey" is partly supposititious, but it seems to us that nearly all, if not all, of the suppositions are within the bounds of reason. He does not assert that an acre of good bee-pasturage produces only ten pounds of honey. What he says is this: That by going $2\frac{1}{2}$ miles from home, bees would scour a territory of about 12,000 acres. That if 10,000 pounds of surplus are secured, it would be only ten pounds per acre for 1,000 acres; and he thought there might be enough honey producing plants upon the 12,000 acres to make 1,000 acres of good pasturage. One thing is certain, the bee-keeper who gets 10,000 pounds of honey from one apiary, secures a product that has been gathered at a much less rate than ten pounds per acre, or else a few acres have yielded at a much greater rate. It is of course possible, yes, probable, that an acre of honey producing plants under cultivation upon rich land, may furnish more than ten pounds of honey, in fact there is pretty good evidence that much greater yields have been secured, but this does not prove that it is always profitable to plant for honey. The yields reported by Messrs. York and Shipman are exceptional; were it otherwise the question of planting for honey would need no discussion. We did not intend, by our remarks in the March No., to convey the idea that planting for honey was never profitable, as we believe that it often is highly remunerative. When the conditions are such that Alsike can be raised at a profit, aside from the honey it may yield, or large tracts of waste land may be occupied with sweet clover, we believe that such planting for honey may be made profitable, and, at present, that is about the

extent of our belief. There is, however, another point that comes in right here, and that is, when we get a location nicely stocked with honey plants, and everything arranged exactly to suit us, there is nothing in the world to prevent another bee-keeper, or a half a dozen of them for that matter, from settling down near us and dividing the field. For instance, Mr. J. H. Robertson, who has labored for years to stock his location with Alsike, is now beginning to fear that he may be obliged to "pull up stakes" and seek "pastures new." As fast as the fields of Alsike increased, or rather a little faster, so did bee-keepers multiply. Mr. Snyder makes one point that we consider a good one, viz., an increased yield of honey would not greatly increase our labor, and adds nothing to the interest on the capital invested in bees, fixtures, etc. We are, however, firm in our belief that small patches of honey plants are no advantage, and that they may even be a detriment. It is true that Dr. A. B. Mason received 50 lbs. of surplus per colony from 75 colonies having access to about ten acres of sweet clover, but this does not prove that James Nipe, with 200 colonies, might not find seven acres of sweet clover an actual detriment. It is also true that Mr. Shipman reported an enormous yield of honey in four days from Alsike, but he did not say that it continued to yield at this rate during the whole period of its bloom.

BEES AND BEE-KEEPING—VOL. II.

(Continued from the April No.)

Chapter IX. is devoted to "The Production of Honey." Old fashioned smokers, section boxes of the different styles, surplus cases, etc. are described and illustrated.

A method of fastening in foundation by using melted wax is described, but it seems too "fussy" as compared with the use of the Parker fastener. Speaking of open-sided sections, Mr. Cheshire calls them an important improvement and says they must be generally adopted, an opinion with which we beg to differ most heartily; but we agree just as heartily when he says: "Sections on the side of the brood-nest give much trouble, and are, all things considered, undesirable." Separators are spoken of as a "necessary evil", and regarded by the bees with a "wee prejudice", but "holding their own because they always give an amount of flatness and regularity, which can only very occasionally be attained without them." In reading the

different plans resorted to for preventing the connecting of brace-combs with the bottom bars of the sections, we could not help wondering if our cousins across the water had not adopted the Heddon, slatted, break-joint, double bee-space honey-board. Mr. Cheshire says it has long been his practice to so place his crates that the sections run across the brood-frames. This is done to prevent the building of brace combs, and the Author says it visibly reduces the difficulty. All vessels made to hold honey should not be made of galvanized iron, as the iron and zinc form a galvanic couple favoring an attack by the acid of the honey. Zinc vessels are also unsuitable and syrup left in them may become so impregnated as to poison the bees if fed to them. In uncapping honey, Mr. Cheshire favors upward strokes with the knife. We much prefer the downward stroke. The Author is opposed to the use of old combs for securing extracted honey of the finest color. He also objects to extracting from combs containing brood: and we agree with him, as we do when he sustains the idea that strictly first class honey cannot be secured when it is ripened artificially. He further says that the candying of honey is no proof of purity, yet it is a presumption in its favor. Mr. Cheshire says, in substance, that it is no trick at all to raise extracted honey, while it is "easy to fail dismally in reference to comb honey, heavy yields of which are only won by skill and well-timed attention on the part of the bee-master." Mr. Cheshire condemns side-storing. The honey ripens slowly and the sealing is sluggish. He then enumerates the advantages of the tiering-up system. The heat rises through any number of workable stories: a whole story can be added or removed at once, or the honey may be left on until the rush of the honey harvest is over. Although the Author advised, in a former chapter, giving of a fertile queen to a colony that had just cast a swarm, and called attention to the fact that many more bees would be the result, he admits in this chapter that the "question of the limitation of the production of brood is most important, especially in relation to comb honey." Mr. Cheshire says there is a temporary gain in having colonies containing a large number of bees—such colonies as may be secured by uniting—because the proper temperature is secured with less effort and because the working factor is large in proportion to the egg producing factor. He admits however that the gain

is accompanied by a loss, the bees are in each others way, "and careful experiments seem to indicate that after twelve pounds of bees have been heaped together, the loss is greater than the advantage." In speaking of interchanging sectional brood-nests the Author says: "Interchanging cuts the theoretically globular collection of brood horizontally, and the circumference is brought to the centre, while the widest part of the nest takes the top and bottom. Honey is now inevitably removed from the middle, and cannot be placed above, for brood already holds possession. In all subsequent work, the shallower frame appears to the Author to have every way the advantage, while he has proved it to be superior for wintering purposes." Mr. Cheshire calls attention to the importance of having the brood-nest "a block of brood" before putting on the sections. He approves of extracting the honey from unfinished sections at the end of the season and using them to give the bees a start the next season. After the bees have made a start, he considers foundation nearly equal to comb, as the gap formed by raising the first super strongly stimulates the bees to fill it. But it is owing to the fact, says Mr. Cheshire, that bees prefer comb to foundation that Mr. Simmin's system largely depends for its success. Bees prefer to work in sections supplied with comb to building comb below. The Author says it would be easy to give a long catalogue of distinguished honey producers, who all declare in favor of small brood-chambers when comb honey is the object; and then follow several pages upon "contraction" that we would gladly quote. Among other things he says: "Let us imagine that the brooding, feeding and sealing of a single bee, from the egg upwards, costs as much to the colony as storing four cells of honey—an estimate which careful attention to this problem has shown me to be moderate, even in ordinary yields. Then the production of one pound of bees will reduce the honey stored by sixteen pounds; if the comb has to be built, by probably eight pounds. It is because a bee in a fair yield is able to requite the colony with many times its cost that a large population means surplus, but if the one pound aforesaid is produced at the end of the honey yield, the expenditure has been made without a possibility of returns. The supposition that tremendous laying on the part of the queen is requisite right down to grey autumn, is most shallow." When the

brood-nest is so contracted that nearly all the honey is stored in the supers, Mr. Cheshire says "the bees will be left so poor that sugar must be fed to them: but our profits, as well as our experience, if we have it, will cause us to do this with a cheerful heart and a generous hand." In regard to what is the best size for a brood-chamber, the Author says: "The ground is covered by the double statement that the brood-chamber should be as large as the queen can be got to fill in anticipation of the great in-gathering, and as small as it can be made (so that swarming is not induced) when the bees raised in it will no longer pay for their up-bringing." Attention is called to the advantages possessed by shallow frames when contraction is practiced. Mr. Cheshire apparently favors the plan of hiving swarms upon starters only, and says there is no danger of trouble from the building of drone-comb, unless there be mismanagement. He still further says that the statement that on this plan the pollen is carried into the sections does not agree with his experience. Swarms do not usually carry pollen for three or four days; but if no cells could then be found to receive it, undoubtedly it would be carried aloft, especially if narrow sections were in use. In speaking of extracting honey from combs in which breeding has taken place, Mr. Cheshire says: "The truth is better faced: the specks, tiny though they be, consist, mainly, of larval excrement." A good hand magnifier determines this point instantly. It is with reluctance that we cease making extracts from this most interesting chapter.

Chapter X. discusses the subject of "Wintering." The Author ascribes the loss of bees in winter mainly to one of four causes, viz. Scarcity of bees, insufficiency of food, want of proper protection, and errors in ventilation. We are surprised that he does not mention improper food. He says that bees are warm blooded, that the temperature is never allowed to fall below 65° in the centre of the cluster, yet he admits that bees hibernate, and gives Mr. Clarke credit for originality in the matter, although he says that he (Cheshire) published the outlines of hibernation six years earlier than did Mr. Clarke. The discussion in this country over hibernation has been, principally, the result of a misunderstanding of the word, and its meaning. The Author says that the temperature of 65° can be kept up in the cluster with the least effort when the surrounding air stands at about 40°.

or a little more, and could this degree be preserved without variation, as it practically may be by the plan of "cellaring", the bees would come through, to spring, young, with life before them. The age of bees is not to be reckoned by number of days so much as amount of service and the sum of the energy they have been called upon to exert. If the outside temperature falls too low the bees resort to increased breathing, then to a gentle flapping of the wings, and in this way greater quantities of honey are consumed and more heat evolved. According to calculations made by Mr. Cheshire the air in a bee hive must be changed 2,400 times during the consumption of one and one-half pounds of honey. This amount of food would last a well protected colony about six weeks, and the air in the hive would require a complete change every thirty minutes. This, to us, is quite puzzling when we think of the successful wintering of bees buried two feet deep under frozen earth. Mr. Cheshire says that the escaping vitiated air carries away, in its altered form, nearly the whole of the honey consumed, thus excrementitious matter is scarcely produced by consumed honey, but it is rather the result of waste tissue and of the indigestible substances contained in large amount in the pollen which the bees consume to make good the wasted tissues. In regard to the "pollen theory" Mr. Cheshire admits that without pollen the bowels will not become distended but says it must not be forgotten that the bees will suffer emaciation from semi-starvation. He believes that the right remedy for bowel distention lies in carefully securing good wintering conditions, thus saving the waste that makes nitrogenous food necessary. In regard to hives with dead (?) air spaces Mr. Cheshire says: "It has been argued that air is a better non-conductor than any solid substance, and therefore, is better than any form of packing; but the fallacy lies in this, that the so-called dead air is not dead but circulating. It rises against the inner skin of the hive, and falls where it touches the outer, and so is ever acting as a distributor of heat." Cork dust has a non-conductivity nearly one-half greater than chaff; is perfectly effective even with poor carpentry: not liable to mildew, and does not drop down between the wooden skins as chaff does. In the April REVIEW Mr. Heddon advised thin packing in the spring in order that the bees might receive warmth from the sun. Upon this point Mr. Cheshire

says: "The idea that thin walls are superior to thick because the sun's heat passes through to warm the bees is certainly inaccurate. If the transitory advantage existed, it would be at the cost of constant loss, but it does not exist. Bees maintain 65°, and must uninterruptedly, though very slowly, lose heat through the hive walls until this becomes the temperature of the external air. Those, therefore, in the thicker hives will be warmer until this external temperature is reached, but before then the bees would be in full flight, and beyond the need of sun-warming."

Chapter XI. is devoted to "Diseases and Enemies." The opinion that bees seldom suffer from diseases is very general. Foul brood and dysentery being about the only ones that attract much attention. As our Author says: "Sickly bees have neither pale cheeks nor sunken eyes, and, therefore, all were accounted healthy; but the use of the dissecting-knife and microscope reveals the presence of not only contagious or zymotic diseases, but occasionally curious organic disorders. The subject of foul brood, or *Bacillus alvei*, receives most thorough treatment; and, according to the experiments of Mr. Cheshire, there is but little doubt that the bacilli do not confine their attacks to the larvae only, but the mature bees, the queen, and even the eggs are infested. Mr. Cheshire says that it is impossible for bacilli to multiply in honey, but admits that it may be made the vehicle that transports the spores. In employing the phenol cure there must be no doubt as to whether the bees use the medicated food; simply placing it upon the hives will do nothing, as, if honey is coming in, the bees will not touch it. If it becomes necessary the hive must be opened and the mixture poured about the brood-nest. Mr. Cheshire gives the method described at Chicago last fall by Mr. McLain. At the convention, Mr. McLain was hard pressed to give the names of those who had cured foul brood by his method, but he declined to do so as, the parties did not wish it known that they had had foul brood in their apiaries. Since then we have learned of an instance in which over 300 colonies were cured of foul brood, four years ago, by the McLain method, and they have stayed cured. We learned of this cure from the lips of the owner of the bees, and he is a gentleman of undoubted veracity, but we are not at liberty to give his name. Had we colonies diseased with foul

brood, we should employ the McLain method with the utmost confidence that the cure would be speedy and certain. There is one point in the treatment of foul brood that ought not to be forgotten, viz., that all colonies in the apiary should be treated the same as though diseased. Unless this is done, the healthy colonies become infected while we are curing those diseased.

Under the head of enemies are mentioned the wax moth, the death's-head moth, the bee louse, the blue tit, the toad, mice, snails, wasps, ants, etc. In former times these were the most dreaded foes, and diseases accounted as trifling and infrequent ills. Our Author closes the chapter by saying: "How different the case now! Our modern hives keep the old pests pretty much at bay, but infectious diseases are on the increase, and are also appearing in new forms. It is no safeguard to shut one's eyes to a danger. Safety rather lies in a knowledge of the magnitude of any evil, and respecting this one, slackness is all but criminal."

Chapter XII takes up "The Chemistry of the Hive." Almost the first thing in this chapter is a complete description and diagram explaining sugar analysis by polarised light. The presence of commercial glucose or cane sugar in honey is easily recognized by the application of the polarised light test. Soft water should always be used in rendering wax; if hard water must be employed an acid should be added which will unite with the lime in the water and prevent it from attacking the cerotic acid of the wax. Old combs should be thoroughly soaked before being rendered into wax, otherwise the cocoon skins absorb some of the wax. Propolis is not necessary to bees under domestication, and Mr. Cheshire says that the disposition to propolize is capable of considerable reduction by careful selection.

"Races" is the title of chapter XIII. Mr. Cheshire says that the testimony is pretty general in favor of crosses, and this ought to modify the disappointment all must feel in the relative failure, up to the present time, of controlled fertilization.

The different races are taken up one by one and their characteristics given; but all these have been given so frequently in the bee-journals that it scarcely seems necessary to repeat them.

Chapter XIV. is a "Calendar." It gives hints as to what ought to be done in each of the different months; but it is difficult to

put anything new into these "calendars."

The book is nicely printed and bound and brimful of the finest of new engravings. It also contains many points upon which the lack of space forbids even a mention. We only regret that the high price, \$2.50, will prevent it from finding its way into so many bee-keepers' libraries as it otherwise would, but we fail to see how it could be furnished for any less. It is for sale by Thos. G. Newman & Son, 925 W. Madison St. Chicago, Ill.

EXTRACTED.

Hiving Swarms Accompanied by Queens.

The views that we held, four years ago, in regard to hiving bees, are well expressed in the following article which we contributed at that time to the A. B. J. — For the management of swarms with unclipped queens we still hold the same views. As we give the article it is somewhat condensed.

My hiving implements are two clothes baskets lined with cotton cloth, and furnished with burlap covers sewed fast at one side, (a long basket, like a clothes basket, is better than a round basket for taking down swarms, as the bees often form long clusters lengthwise of the branches), a step-ladder, a pair of heavy pruning shears, a fine-tooth saw for cutting large limbs, a quart dipper, a fountain pump, two large tin pails, and if the apiary were not located near a small stream, I should add to the above a barrel for holding water.

When a swarm begins to issue, I carry a hive to the stand that I wish the swarm to occupy, and prepare the hive for occupancy. When the bees begin to cluster, I make an examination to see if they are clustering in a favorable location for shaking them into a basket. If they have selected a spot where two or more limbs cross, or small branches are interlaced, I take the shears and clip away some of the branches, and thus secure the cluster in a convenient location for dislodgement.

If the bees are slow in clustering, at a time when more swarms are momentarily expected, I sometimes hasten matters by sprinkling the flying bees, by using the spraying attachment of the pump. When the bees are fairly clustered, I first detach a small portion of them that perhaps are adhering to some small twig, and carry them, still adhering to the twig, and place them at the entrance of the hive, without dislodging them from the twig. These bees at once commence running in and setting up that joyful hum announcing that they have found a home; and when the rest of the swarm is brought and shaken down in front of the hive, this humming at the entrance calls in the swarm at once; while, if the swarm is shaken down without this precaution, a large portion of the bees often take wing, perhaps the queen

among the number, before the entrance to the hive is discovered, and the fact announced by joyful humming.

Many of the bees that take wing go back and cluster where they originally clustered, and if the queen takes wing she may go with them. If there is no small cluster that can readily detached, I then dip off a quart of bees from the lower part of the cluster and pour them down at the entrance of the hive. After some of the bees are running in at the entrance of the hive, I hold a basket close under the cluster and shake the bees into it with a quick shake, throw the burlap cover over the basket to prevent any of the bees from leaving, carry the basket to the hive, strike one end of the basket sharply upon the ground 2 or 3 times, which will shake all the bees to one end, and dislodge them from the cover; throw back the cover and shake the bees out upon the ground in front of the hive.

I do not shake them against the front of the hive, as the entrance would at once become clogged; but perhaps 18 inches or 2 feet from the hive. I do not sit right down by the hive and drive the bees in with a smoker, and keep a constant watch that the entrance is not stopped up, but I do go occasionally and see how things are progressing; and, if there is a great mass of bees clustered over the entrance, I poke them away and thus clear the way for another installment of bees to enter.

If the bees cluster upon a small branch that I am willing to sacrifice, I cut it off and put it with the bees in front of the hive.

ROGERSVILLE, MICH.

Hiving Swarms with Clipped Queens.

In reply to the above Mr. G. M. Doolittle contributed the following excellent article to the A. B. J. We give it in a condensed form.

Although I clip my queens, I have, for the past five years, hived very few swarms by the returning-plan, but when I do, the plan is thus: When a swarm is seen issuing, I (or Mrs. D.) step to the rear of the hive and then look on the grass to one side of it to see if there are many bees there, thereby indicating the presence of the queen; and if not, step up on that side and glance over the ground in front of the hive. If the swarm has nearly done issuing, the queen is readily found by a little cluster of bees being about her. If just commenced to swarm, look at, or near the entrance where she will be seen running as soon as she comes out. Have on hand a round wire-cloth cage, 1½ inches in diameter by 8 inches long, made by rolling a piece of wire cloth around a stick, and sewing the sides together, when a stopper is to be fitted in each end.

As soon as the queen is seen, place the cage in such a way that she will crawl into it, and if a few bees go in with her, all the better. Now move the old hive back, and place in its place the one which the swarm is to occupy, when the cage with the queen is to be laid near the entrance. Place the old hive where you wish it to stand, or move it up beside the new hive at right angles, a la Héd-

don, as you prefer. Have on hand two sheets, one of which is to be placed on each of the hives on either side nearest the one now awaiting the swarm, so that they can be spread over them should the swarm attempt to enter these hives upon returning, which they rarely will do if the queen, with a few bees, is left at the entrance of the new hive. Leave the queen caged until nearly all the bees have entered the hive (or become clustered on the outside, as they sometimes will do), and are quiet, when you will let the queen go in. By thus keeping the queen caged, you will avoid the difficulty of her running out, and the bees with her.

If they are clustered on the outside of the hive, let them become quiet after the queen is out of the cage, when you will detach a few and start them to running into the hive; then detach more bees, and so on until all have run in.

If several swarms come out together, more sheets are needed, so that if more than the right proportion of bees draw toward one of the new hives placed on the old stands, a sheet can be thrown over until they go as you wish them to. But, as I said at the outset, this plan of hiving does not necessarily follow having the queen's wing clipped, although many prefer it. The simplest plan, and the one I use most, is to go to the woods and cut a light, tough pole, which will reach to the top of my tallest tree, providing that it is not more than 20 to 25 feet high. If swarms attempt to cluster higher than this, I always use the returning-plan above given. Have the large end of this pole sharpened so it can be pressed into the ground when necessary. Near the upper end of it fasten a few dry mullein tops, or a roll of black rags, as large around as your arm, and a foot long, when your pole is ready.

When a swarm issues, proceed to get the queen as before, and when caught, secure the cage to the black bunch at the top by means of a bent wire. Raise the pole in the air, and keep it where the bees are thickest, when they will often alight on the pole; and if not, they will soon select a spot to alight upon the same as they would if the queen were flying with them, for her presence is known to them just the same as if she had her wing whole and was among them.

As soon as they begin to alight, place the pole in such a position that the queen and black bunch comes in the place they are clustering; and leave it thus while you are preparing a hive for them. When they are partially clustered, raise the pole, or push it up and out, so that the queen and bunch of rags, with the bees on them, is a foot or so from the limb, when all the bees will cluster with the queen; after which you can carry them wherever you please, the same as Mr. Hutchinson does his branch after he has cut it off.

You should also hive them as he tells you, by first detaching a small part of the cluster, and after they start up the call of a "home is found," detach more, and lastly let the queen go in.

Now we will suppose that the second, third or fourth swarm issues before you get ready to hive the first, simply let them cluster on the pole, and you are at liberty to prepare

the second, third, or fourth hive, as the case may be, leaving a queen in front of each hive except the first, as that has the queen on the pole. When all are clustered, take the pole and carry it to one of the hives having a queen in front of it, when you will proceed to hive them as at first, till you have got the right proportion of bees for one hive, then go to the next, leaving enough for a colony there, and so on until all are hived as you wish them.

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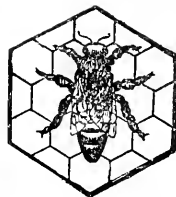
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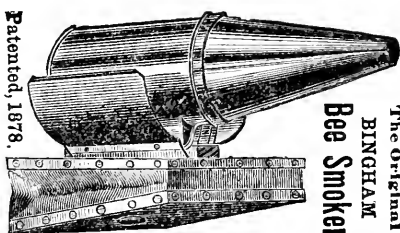
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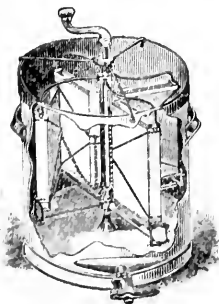
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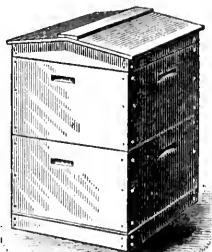
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It begins with taking the bees from the cellar and goes over the whole ground until the honey is off the hives, clearly and concisely touching upon the important points. Its distinctive feature, however, is the thorough manner in which it discusses the use of foundation, showing when and where it should be used, when combs are preferable and when the bees should be allowed to build their own combs. It especially shows how swarms may be hived upon empty frames and more surplus be secured than would have been the case had foundation been used. The price of the book may be saved in foundation upon each swarm hived, and more surplus secured into the bargain. Get the book now, and have your fixtures in readiness to put in practice its teachings.

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PRICES:

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THE BEE-KEEPERS' REVIEW

VOL. I.

FLINT, MICHIGAN, JULY 10, 1888.

NO. 7.

Feeding Back Unprofitable, Except for Completing Nearly Finished Sections.

JAMES HEDDON.

FRIEND HUTCHINSON:—I congratulate you on selecting this most important subject for this issue. I presume there will be quite a diversity of opinions expressed by your different able contributors. These opinions will, no doubt, be the results of different experiences, and these different experiences will result more from variance in minor conditions thought to be of little importance by the ones who made the experiments; when, in reality, they are of vast moment. I believe that the practice of feeding back, to any considerable extent, would amount to a loss, and tend to degrade rather than forward our chosen pursuit. I will not attempt to outline the various experiments which have taken place in my apiary relative to the question at issue.

The only practically profitable feeding back will be found in connection with feeding a little at the close of the comb-honey harvest for the purpose of completing unfinished sections. In few words, I will state that the feed should always be pure honey of the lightest color, and usually diluted with warm rain-water to the consistency of nectar. Feed during the night and from the top of the entire surplus departments. The feeder should not leak honey, nor the heat and odor from the bees or feed, nor should it drown or daub a bee. It should be filled and refilled without the use of smoke or contact with the bees, and enable the operator to see how much food has been taken and how much is remaining in the feeder. I say this because, without the use of an excellent feeder, feeding back becomes dangerous, vexatious and unprofitable. It must be understood that the colony that is being fed must not be weak and its brood-chamber must be contracted to not more than the capacity of five Langstroth combs, and we have found a still smaller brood-chamber preferable. One section of my new sectional brood-chamber hive works admirably, and while the capacity is equal to five L combs, no further contraction of it is necessary, because of its shallow form. We have had much pleasant experience in this direction.

One matter I came near forgetting, is that the feeder should not only cover the entire top surface of the surplus receptacles, but

the bee-entrances should extend its full length on both sides and should be nowhere else. Whoever experiments on this point will see the great advantage such an arrangement lends in getting the sections finished evenly and quickly in the supers below. We feed in the evening, just as the bees cease flying, and with such feeders as I have partially described, and with our storing tanks and carrying-cans, three men have been able to feed fifteen hundred pounds in an hour, no smoke being used, no jarring of hives, and no coming in contact with the bees. We diluted the honey with hot water so that it would run freely or we could not have made such dispatch. Brown German bees are the best to feed back to for the purposes desired.

Then to sum up, feeding back will pay, only for the purpose of finishing incomplete comb-honey, and, to make it a radical success, the above, and no doubt, other conditions peculiar to each location, must be learned and carefully complied with.

DOWAGIAC, MICH., July 2, 1888.

Feeding Back.

R. L. TAYLOR.

Whether feeding-back to secure the completion of partly filled sections pays, in the long run, I shall not now attempt to decide; but shall content myself with suggesting three or four points which must be maturely considered before the question can be rightly determined.

First, the honey thus produced is never, I think, of the finest quality. I always imagine it to have a flavor foreign to comb honey produced in the ordinary way; and, at least, it candies readily, which alone is likely to place it among the lower grades of honey. Secondly, when it becomes noised abroad that comb honey is produced by feeding the bees, consumers will be startled, and the markets will be affected more or less; and the sale of candied comb honey will have even greater effect upon the market. The inexperienced will buy it unawares and the purchase by them of no more honey of any kind would be a very natural result. Thirdly, to be a success, feeding-back must be done in the interval between bass-wood and fall flowers, when, of all the year, the weather and the bees are the most trying—a combination which makes the labor very

undesirable. Fourthly, if foul brood should find a lodgment in an apairy, and remain for a time undiscovered by the apiarist, nothing else would spread it so rapidly and so effectively as feeding-back.

Were it not for these troublesome matters, feeding-back, to make partly filled sections available for the market, would, no doubt, be profitable. To test the matter somewhat, three years since, I fed one colony extracted honey sufficient to complete three cases of sections—not sections partly filled but new sections with foundation. When completed I found I had fed 124 pounds and had in three cases 78 pounds of comb honey in fine shape. There was not a pound of honey in the brood chamber either when the experiment was begun or when it ended. In this case there was perhaps profit enough, as markets usually are, to pay for the labor involved besides leaving the colony in greatly improved condition.

Now, suppose I had varied this experiment by taking six cases partly filled, containing, say 60 pounds, of honey. As the foundation would be well drawn out, and, consequently, the honey more rapidly stored, I estimate that the 124 pounds would have been sufficient to complete the cases and turn out at least 150 pounds of well capped comb honey. We may approximate the profit by comparing the expense with the result. The 60 pounds of unfinished sections would be worth not more than the extracted honey, which, being added, makes 184 pounds at, say 8 cents, giving an expense of \$14.72, which, taken from \$24.00, the value of 150 pounds of comb honey at 16 cents, leaves a profit of \$9.28, or 63 per cent. The improved condition of the bees and the increased salableness of the product may be considered an equivalent for the necessary labor.

To insure the largest success I have found that the following several particulars must be faithfully observed:

First,—If separators are not used, it will not do to put the unfinished sections into cases hap-hazard. The comb of some must be trimmed and sections equally worked out must face each other in order to secure shapely sections of honey.

Secondly,—Fairly strong colonies of proper characteristics must be selected for the work. Italians will not do well. So far as my experience goes, a cross between the Italian and the black, with the blood of the latter predominating, rather than that of the former, is best.

Thirdly,—The brood chamber must be contracted to the capacity of five 14 frames.

Fourthly,—The work must be done during warm weather and should be undertaken promptly on the cessation of the flow from white clover and basswood.

Fifthly,—The feeders must be kept constantly supplied with honey, which, I think, should not be diluted, but fed as it comes from the extractor.

The feeders should be capacious, the one known as Heddon's is by far the best—and are to be placed immediately above the sections.

By observing these hints and the dictates

of sound common sense any one may, I think, attain fair success: but, as I have intimated, the work is not a pleasant one, and it is well worthy of consideration whether it would not be better to keep a few more colonies and thereby obtain equal results with less of wearing labor.

LAFER, MICH., June 22, 1888.

The Difficulties to be Met in Feeding Back.

DR. C. C. MILLER.

If only those who have been particularly successful in any one thing are the proper persons to write about it, then I am not the proper person to write about feeding back. I have fed back a good many pounds of honey, and am satisfied that, for me, there is no profit in feeding extracted honey to have it changed into comb honey, even with the widest difference I have ever known between the prices of comb and extracted. The only way in which I have ever felt that I was successful in feeding back was when, near the close of the season, I had sections that were filled and nearly sealed over. In such case these nearly finished sections, although of full weight, could not be sold for the same price as those fully finished: and the question was, (and it is still a question with me), is it more profitable to sell these sections at a reduction of two cents per pound, or to feed back extracted honey enough to have them all sealed over? On the whole I lean rather toward selling for a lower price in preference to feeding back. It may be well to say to those who have only a few unfinished sections that I hardly think it is worth while to attempt feeding back unless it is done on a pretty large scale. A good many pounds must be fed before any work is commenced on sections, and if you have only a few sections to finish, say 20, you may have to feed a good deal more than the weight of those 20 sections to get them finished. But if you have a large number of unfinished sections, then it may pay to experiment. I advise you to begin as early as possible after you see that the natural harvest will not suffice to finish the sealing. I don't know the reason, but I think bees make better work storing what is fed when a very little is coming from the field than they do after the flow is entirely over. Then when you do begin, crowd the work. Give them all they will take, and as fast they will take it. Read carefully all the editor said about feeding back in June number of the Review. There are some excellent points made there that it is not worth while for me to repeat. One difficulty you will meet, is the putting together a number of sections taken from different places. If you do not use separators the difficulty will be greater. Even those who are most successful in getting straight sections without separators, I think, find that there is more or less bulging of one section into another. Not enough perhaps to injure the sections for market, but enough so that when their positions are changed the cappings will almost touch in one place, and in another there will be a

space between the sections, perhaps twice as much as the bees would leave. Now, as the bees left these sections, (and there will be some of the same trouble with separators, only in less degree), the space between was just right, and if you could feed back without moving the sections from their position, just as the bees had them, there would be nothing to do but just to finish the sealing, but the best I could ever do, even with separators, there would always be more or less drawing out of the cells, and then when this was sealed over it had more or less of a patched appearance, as if it were an after thought on the part of the bees. After feeding for some time the bees seem to lose interest in the matter, loaf on the feeder, and, by some strange perverseness, dump patches of fresh wax on the feeder although at the same time there is plenty of room for them to put the wax on the unfinished sections. I am sorry to say that I can give no definite rule for the consistency of the honey fed back, but I know they will make much better and faster work if the honey is quite thin, perhaps one-tenth to one-fifth water, and let it be given quite warm, yes, hot: no harm if it is hot enough to burn their tongues, they'll work at it carefully till it cools, only that if hot enough to burn them there is danger that you will spoil the quality of the honey. If you make the honey pretty warm without the addition of water and then add boiling water afterward, I think you will not run any risk. After being more successful than I have been, please tell us all about it. But mind you, I'm not to blame if you fail, for I much doubt if you will make it pay.

MARENGO, Ill., June 27, 1888.

Feeding Back Sometimes Profitable, but the Honey Candies.

H. D. BURRELL.

Nearly every year, for 10 years, I have practiced feeding extracted honey to secure the completion of partially-filled sections. During that time, with varying success, I have fed many tons of honey, and experimented on a large scale in every way I could think or hear of. The best results were obtained from a system materially like the one mapped out in the June Review. I have obtained, for a season's feeding, an average of three pounds gain, in weight of sections, for each four pounds fed, and, with some colonies, under very favorable conditions, much better results. But, in our changeable climate, one year with another, it does not pay me to feed, except in a small way to secure the completion of nearly-finished sections. Cool nights seriously interfere with operations.

And there is a more serious drawback. This "fed" honey soon candies. I have had it candied in October as solid as maple sugar; and, with me, it invariably candies when cold weather comes. All "fed" honey should be sold early, and where it will surely be consumed before it candies, or the honey business will certainly suffer. I can think of no probable cause that will so surely give

credence to the "Wiley lie" as the candying of comb honey.

Honey which is not thinned before feeding remains liquid longer than that which has been thinned. I obtained the best results by feeding thick honey. It is not carried from the feeders quite as quickly, but is capped sooner.

BANGOR, MICH., June 28, 1888.

Feeding Back Unprofitable.

S. T. PETTIT.

DEAR BROTHER HUTCHINSON:—If I were in a position to do so, it would afford me great pleasure to comply with your request to write out for your very interesting and valuable periodical my experience in feeding back. My head trouble is so bad now that I read but little and write only when I am obliged to.

I may say to you, in a private way, that, a few years ago, some one gave a plan of securing lots of "comb honey" by the use of the extractor: throwing out the nectar green, as fast as it came in, thus exciting the bees to gather all they possibly could and then when the honey season was past just feeding it back, thus securing big crops of comb honey. Well, the plan looked reasonable on paper, but, in actual practice, it looks very different to me. Of course, I waited until the gathering season was past, and then went enthusiastically to work giving unfinished sections, mostly, to work upon. Well, the amount they managed to cram away in the brood-chamber before starting at all in the sections, took a good deal of the enthusiasm out of me; but, at length, they went reluctantly, tardily at work in the sections. But the sections were not as nice and even as those built by the same bees during the honey flow.

Another set-back to the scheme was found in the great loss of weight during the feeding-back process. I did not keep an accurate account but I believe it to be 40 to 50 per cent.

I found that great care and constant vigilance were necessary to prevent robbing.

Another serious objection that presented itself consisted in the fact that all the bees used for feeding back died outright or dwindled badly. Too much honey in the brood chamber I think was the cause.

My opinion is that it will not pay to feed back even to complete sections that are nearly finished, much less the building of whole sections.

BELMONT, ONT., CANADA, June 27, 1888.

Success in Feeding Back Very Dependent Upon Circumstances.

W. H. SHIRLEY.

FRIEND HUTCHINSON:—I would gladly comply with your request to give my experience in feeding back, but I have had only one season's experience in that line, and I do not think one trial of any line of work with bees

goes very far to prove or disprove a thing.

The season that I practiced feeding back it paid me well; but I have always attributed my success to a fortunate combination of circumstances.

At the close of clover and basswood bloom I had a lot of unfinished sections on the hives, and extracted honey was cheap, and, by placing a good many sections upon a hive, (prepared beforehand for the purpose), I succeeded in finishing off the sections at a small cost in advance of the first cost of extracted honey.

One thing I do know, and that is, the weather and condition of the colonies employed makes a great difference in the results.

MILLGROVE, MICH., June 23, 1888.

Feeding Back for Surplus.

As a rule, we are opposed to the publication of an article unaccompanied by its author's name, but we could secure the following valuable experience only by allowing the writer to use a nom de plume. We are well acquainted with the gentleman, however, and perfectly willing to vouch for his reliability.

A few years since, it was intimated in certain quarters that a grand discovery had been made that would surely revolutionize at least one important branch of bee-culture; viz., the production of comb honey. A little later it became known that this discovery was nothing more nor less than the feeding back of extracted honey. The higher price and readier sale of comb honey was the main incentive for changing the liquid article into this shape for market, and the scheme certainly bore upon its face the essentials of success. That it has not come into general practice is doubtless due to obstacles that were not anticipated at the outset.

My first feeding with this object in view was done in 1881. Having some 3,000 pounds of extracted honey of extra heavy body, but a little off in color, I determined to see what could be done by way of transformation. This honey was fed to about 30 colonies, and four pounds of comb honey were secured for each five pounds fed back. This, of course, included the weight of the sections in which the honey was stored. I have since fed during several seasons, but with varying results. My experience in this line suggests the following observations:

Success in feeding back depends largely upon certain conditions, and to make it pay requires close and careful attention to details. The operator who is not willing to do this had better not attempt it, for failure will be certain. In selecting colonies to be fed we choose those having young, vigorous queens, and an abundance of bees. I have found the dark colored Italians the best; hybrids, whose mother was pure bred but impurely mated, the next best; and black

bees the poorest of all. With me, the latter soon become "tired," and do not give satisfactory results. The condition of the brood nest is important. About five Langstroth combs is the right size; the two outside combs should be well filled with honey, and the balance packed with brood. Place a queen excluding honey board upon the hive, one case of sections upon this and the feeder over all. The new Heddon feeder is admirably adapted for this purpose; and right here let me say that one brood case of his new hive is away ahead of L. frames. Feeding should be done regularly, every night, and no more feed given at one time than the bees will carry down during the 24 hours. I much prefer that the feeder be emptied clean by the bees each day.

I usually begin feeding immediately after the close of the basswood harvest, or as soon as preparations can be made therefor. Add only cold water to thin the honey; four pounds of water to ten of honey is about right. More than one case of sections at one time is not advisable. Separators between the sections are essential to straight combs in feeding. Remove the sections as fast as sealed over and the result will be as handsome a lot of comb honey as ever the eye beheld. I have always obtained best results, that is, the largest percentage of comb to the amount of liquid fed, by using sections filled with foundation. In feeding to complete unfinished sections I always place those nearest full on the outside of the case.

There, friend H., you have what little I know about feeding back. In the hands of the skillful operator I regard success as certain; and yet, I am persuaded, from my observations of those engaged in bee-culture for the past 24 years, that at least nine out of every ten who attempt it, will fail. The amount of care required is greater than the average apiarist is willing to bestow.

OLD TIMER.

Artificial Honey Comb.

E. B. WEED.

At the request of the editor of the REVIEW, I have written the following concerning my new artificial honey comb and its manufacture.

First, in regard to the comb itself; it is admitted, by all who have seen it, to be a successful attempt to artificially produce that which has so long defied all attempts at imitation—the honey comb of the bee.

At present it is made only in pieces the exact size to fit in a one pound section, but it will shortly be manufactured of any size up to 12x18 inches.

The walls are as thin as natural comb—(1-250 of an inch thick)—and the height is unlimited. The septum is also 1-250 of an inch thick.

The idea is not to furnish the bees with foundation to draw out, but with comb; to add to if necessary, but which will require no further manipulation. For this reason I can subject the wax to such enormous pres-

sure in working that its structure is radically changed. Pressure will harden wax very much. Every bee-keeper must have noticed how much softer are the little white pellets of wax, dropped by the bees when comb-building, than the finished comb which has been pressed into shape by their jaws. It is only when we consider what a very small area of wax is pressed at a time, that we realize how great this pressure. It is by rolling between heavy rollers that soft brass is made into hard brass, and wax is hardened in the same way. This renders it possible to make the artificial comb thinner even than that made by the bees.

The comb is also made with a wooden base, of thin veneer, for use in the brood-chamber. I find that, with a cell of about 3-16 of an inch depth, the bees make no distinction between wood base and natural comb, and breed and store honey in them without any objection whatever. Of course the advantages of such a comb are too obvious to mention, and it can be made much cheaper than wired frames of foundation.

The machine for making the comb is almost impossible to describe without illustrations. I can say, however, that it is totally different in every respect from any foundation mill or press. It does not use sheets of wax but takes the wax in a block, about six inches thick, and delivers it in a continuous stream of comb at the rate of about one foot of comb per minute. This is done by passing it through a steel plate; and upon the accuracy of this plate depends the success of the machine. I have succeeded, however, in making it so perfectly that the comb is exactly 1-250 of an inch in every part. The comb is then cut into three foot lengths, and fed to a second machine which puts in the base and trims the comb to any required depth of cell. The wax can be worked at any temperature within reasonable limits, and, as I have said before, the character of the product largely depends upon the temperature at which it is made. The harder it is pressed the more tenacious is the comb.

As to the effect of the new article on the honey market, I see no reason why comb honey cannot be produced almost as cheaply as extracted is now: it surely is no more work for the bees to store their honey in these combs than in such combs as are now used for extracting. A perfectly filled section will be obtained, and one well fastened on all sides to the section box. I think it doubtful, however, if an artificial comb much thicker than one inch could be used advantageously on account of the difficulty in ripening the honey.

I am anxious to have the comb fully tested this season, and will be pleased to hear from any bee keepers who are desirous of giving it a trial. I will send samples for postage only.

The machine and the comb will both be fully patented in this and other countries. These patents are now being obtained.

238 Third St., DETROIT, MICH.,

July 8, 1888.

The + Bee-Keepers' + Review, PUBLISHED MONTHLY.

W. Z. HUTCHINSON, Editor & Proprietor.

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THE BEE-KEEPERS' ADVANCE AND POULTRY-MEN'S JOURNAL.

This enterprising monthly has absorbed the Feathered Home and the Poulterer, donated a bright new cover, and raised its subscription price to 50 cts. Good.

THE BEE KEEPERS' UNION.

We are in receipt of the third annual report of the general manager of the National Bee Keepers' Union. Did not lack of space prevent, we would gladly publish it. The Union is to be congratulated upon its choice of manager. Considering the amount of money that has been at his disposal he has performed wonders.

ARTIFICIAL COMB.

In the present issue will be found an interesting communication, upon this subject, from the inventor, Mr. E. B. Weed. The operation of manufacture, if we understand it aright, is quite simple; and we think we could make it clear, even without illustrations, but, as a patent is not yet issued, Mr. Weed might not wish it described at present. If he is willing, a full description will be given in the August REVIEW.

That comb can be made with full depth, thin walls, is no longer a doubt; but that its use, in raising comb honey, is advisable, we very much doubt. We have no desire to throw cold water upon any new invention that promises to be useful; and it is sometimes a little rash to indulge in prophecies concerning such inventions; but we must not forget the "kicks" that were showered upon foundation for causing "fish-bones" in comb honey. Foundation lived in spite of the "kicks," and comb honey finds a sale in spite of the "fish-bones;" although it must be admitted that the "fish-bones" of the present are like minnows compared to sturgeons, when compared with the "fish-bones" of old. Now, when we come to make not only

the "bones" but the "whole fish" out of wax, we fear it will be a little too tough chewing. One of the neatest illustrations we ever heard upon this point is the one given by Mr. T. F. Bingham. He says: "Melted butter is grease, and melted honey comb is wax." There is a delicious, flaky brittleness about comb built by bees that is never quite equaled by that built from foundation, even though the foundation be ever so thin. We know Mr. Doolittle pushed a wire through sections of honey built upon different samples of foundation, and compared the resistance with that produced by pushing the same wire through natural comb; and with one sample of foundation the resistance was less than with the comb built entirely by the bees. But it must not be forgotten that pushing wires through a comb is quite a different affair from that of eating the honey. We imagine that artificial comb, even though it be filled with honey by the bees, would be pretty tough eating. But Mr. Weed very generously offers to send samples free, only asking that stamps be sent for postage, and all can test this matter for themselves; and we would suggest that everyone be generous when sending the postage.

For use in the brood-nest, or for extracting purposes, we see no objection to this style of comb.

PATENTS.

Mr. A. I Root is well and favorably known. He is looked up to and respected by a large class of bee-keepers, who regard and follow him as pupils cling to a beloved teacher. Through *Gleanings* he is able to sway a large part of the bee-keeping world. Occupying the position that he does it pains us to see him encourage in his followers a disrespect for the rights of inventors who claim the privilege of enjoying the fruits of their brain labor. There is no misunderstanding him upon this point, as he says right out and out that he considers the sale of "rights" as "improper," (and that means wrong), and that he considers it neither just, fair, right nor best that everyone who wishes to use a patented article should respect the rights of the patentee. This has the appearance, at least, of recognizing the patent law neither morally nor legally, and teaching bee-keepers to steal. We know there are many who are opposed to patents upon apianian appliances, and Mr. Root is largely

to blame for this mischievous sentiment, but we very much doubt if, as Mr. Root would lead us to suppose, that the majority of bee-keepers are so ungenerous, unfair and unjust. The fact that Mr. Root has received encouragement in his course, and been opposed by only a few, does not prove that the majority are with him; but rather that it is much more pleasant to send in commendations than condemnations. For instance, Prof. Cook says he has received many letters thanking him for his defense of the right, but not one of censure. During the past month we have travelled about considerably and visited bee-keepers in Mich., and not one have we found who would defend Mr. Root in his position upon this question. Mr. M. H. Hunt, of Bell Branch, is a warm friend of Mr. Root, yet we had not been at his place half an hour before he introduced this subject by saying that he agreed with Mr. Root in most things but upon this one of patents he thought him all wrong. "I tell you," he exclaimed, "Prof. Cook's article was a grand one, and I don't see how any one could read it without being convinced that he was right. What encouragement do we give an inventor if we prohibit him from enjoying the fruits of his labors?" Other bee-keepers that we visited voiced the sentiment so well expressed by friend Hunt. Mr. Root recognizes the rights of inventors, and is willing to reward them for their labor, so long as they do not patent their inventions and allow him to say how much he will pay for a moral "right" to manufacture; but the moment they protect their inventions and are then able to dictate terms to him, he thinks it is "improper." There is an inconsistency here that it is difficult to satisfactorily explain. It is all very well for Mr. Root to give away his inventions, and even illustrate and describe them in *Gleanings*, as his facilities for manufacturing and advertising virtually give him a monopoly in another manner; but there are few inventors who are so situated as to be able to protect their interests in this manner.

We sincerely hope that the day will come when Mr. Root will stand up for the man in this matter, in the same earnest, whole-souled way that he does in other things.

Since the above was in type, *Gleanings* for July 1 has come to hand, and in it we find an article from Father Langstroth taking almost the same grounds and making the arguments as we have done. Mr. Root must

be given credit for allowing both sides of the question to be heard, although he attempts no reply to this last article contributed by our old friend Langstroth; as for that matter, it seems as though no reply could be made, that the arguments are unanswerable.

FOUNDATION FASTENER.

We spent the last day of June very pleasantly and profitably, in the company of Prof. Cook and his nephew, at the home of R. L. Taylor. Among other things, Mr. Taylor showed us an arrangement of his for fastening foundation into sections. It works upon the hot-iron-melted-wax plan. Attached to the upper surface of a board, are perhaps twenty little, nearly square, blocks of wood, each exactly large enough for a section to slip down over it and leave a $\frac{3}{8}$ " space at one side. We may be getting a little ahead of our story, but we may as well say, right here, that when a section is placed over a block it is so placed that the $\frac{3}{8}$ " space comes next to the top bar. The upper surface of these blocks is not level; one side of each block being perhaps half an inch higher than the opposite side. Upon the upper surface of each block is a little sliding platform $\frac{1}{4}$ of an inch in thickness and nearly as large as the block. When one of these little platforms is slid, it "slides down hill" upon the slanting surface of the block underneath. To keep these little platforms in place, a $\frac{3}{8}$ " square strip of wood is tacked to the bottom of each. Each strip of wood extends nearly the whole width of a platform, and fits into a corresponding groove cut in the block beneath.

The work of fastening foundation into sections is performed as follows: Upon each of these platforms is placed a square piece of foundation that will nearly fill a section. After putting on a piece of foundation, a section is slipped on over the block; and the height of the block and platform combined is such at the lower edge that when the fingers are placed upon the foundation, and the foundation and platform "slid down hill," the lower edge of the foundation comes in contact with the center of the underside of the top bar of the section. Before the sliding operation is performed, however, a piece of hot iron, shaped something like a broad, thin chisel, or square pointed trowel, is slipped down between the top bar of the section and the edge of the foundation; then the latter is pressed against the iron, and, as the iron is quickly withdrawn, the melted edge of

the foundation is brought in contact with the top bar of the section. By the time the twentieth piece of foundation is fastened, the operator can begin at No. 1, and remove the sections in the same order that the foundation was put in, placing them in the supers. The irons for melting the edge of the foundation are two in number, one being heated over a gasoline stove while the other is being used. Each iron is nearly $\frac{1}{8}$ " of an inch thick, as wide as the inside of a section, and furnished with a handle. To each iron is also added, upon the back side, a stop that strikes the edge of the top bar of the section, thus preventing the iron from being pushed down too far which would keep the wax in contact with it for too great a length of time during its withdrawal.

This lengthy description might lead one to suppose that fastening in foundation upon this plan would be slow and tedious; such is not the case, however, it being very quickly, neatly and securely fastened. Mr. Taylor assured us, and showed us, that he could do the work more rapidly than with any other method he had tried; while the foundation is fastened most securely, with great exactness, and but little waste of wax.

APIARIAN EXHIBITS AT FAIRS.

Is it advisable and desirable, that is, is it advantageous for bee-keeping and a benefit to bee-keepers, to have displays of bees, honey, wax, implements, etc., made at our state and county fairs, expositions, etc., and, if so, in what manner, and by what class of bee-keepers, should these exhibitions be conducted? This is the question that we propose to take up for special discussion in the August Review. We do not care to discuss this question at any great length from the point of benefit or loss to the individual exhibitor, as what might be of advantage to the individual might have a disastrous effect upon the industry as a whole, and vice versa. If these shows are to be presided over and managed by supply dealers who, in their eagerness to do business, will not hesitate to make a bee-keeper in order to effect a sale, if the fruit of the seed sown at these gatherings is to be a crop of producers, we think the result would be an injury to existing bee-keepers. We do not wish to be understood as opposing the exhibition of hives, implements, and the like; in fact, they may be used to good advantage in impressing the crowd with the true importance, magnitude

and complexity of modern bee culture; imparting the idea that the bee business is really quite a business—one that cannot be picked up and learned in a day by Tom, Dick and Harry.

Anything that will increase the consumption of honey is a benefit to the pursuit, and it seems to us that these bee and honey shows might be so managed, and we believe they often are, as to call the attention of crowds of people to the excellence and deliciousness of honey as a food. Honey ought to be put up in small packages. It may be a little difficult to put up honey in packages so small that it can be sold for five cents, but we believe it has been done, while it is no trouble to find packages that may be sold, full of honey, at ten or twenty-five cents each. People at fairs do not wish to be burdened with heavy or bulky packages, and the honey must be put up in such shape that it may be eaten upon the grounds, or else carried in the pocket or hand-bag without danger of leakage. We remember that one year, at the Michigan State Fair, Mr. H. D. Cutting sold nearly \$40 worth of honey put up in pound and half-pound square glass bottles and in small glass pails. Such management at fairs certainly does the pursuit no injury, while it is an advantage to the one exhibiting the honey. Our Canadian brethren are, we believe, ahead of us in the amount of honey that they sell at fairs.

We doubt very much whether the exhibition of bees at fairs is of an advantage to the pursuit. Looking at a frog fails to disclose the amount of space that he can cover at a jump, and looking at bees brings forth results no more conclusive. The most that can be said in favor of their exhibition is that they attract attention.

We will now mention the points upon which we would be glad to have correspondents touch: 1, Are apiarian exhibitions an advantage or a disadvantage to bee-keepers, and why? 2, Shall honey be sold at the shows, and, if so, in what shape shall it be put up? 3, In what manner shall comb and extracted honey and beeswax be put up for exhibition? 4, Shall bees be placed upon exhibition, and, if so, in what manner shall they be exhibited? 5, Give hints upon packing articles for shipment, getting them to the grounds; putting up and arranging the different articles and the exhibit as a whole, taking down the articles, packing up, and getting home. 6, Shall the awarding of

premiums be done by a committee of three, or shall the work be left to one judge who is an expert? 7, Please give that information that you think would be the most valuable to one who wishes to make an exhibition, let that information be what it may.

FEEDING BACK.

The objections to this practice, briefly told, are that the work must be performed at a time when robber bees are troublesome; there is a liability of creating suspicion in the minds of the public as regards the purity of the honey; the honey loses its freshness, so to speak, by being extracted, stored in vessels, heated, run through feeders, and re-handled by the bees; when honey is fed to secure the completion of unfinished sections, the combs have a botched, patched, bulged appearance, unless they are arranged with great care and the whole operation managed with skill; the combs are also likely to become travel-stained unless care is exercised to have new combs in the brood-nest, or the sections are removed very promptly upon their completion; if there should be an unknown case or two of foul brood in the apiary, nothing would spread it more effectually; but the most serious objection is the increased tendency of the honey to candy.

The advantages are few, but weighty. Comb honey is more salable, at a higher price, than extracted honey, and, if the latter can be changed into the former, at no great expense, there are quicker sales and greater profit: but the greater advantage is in securing the completion of nearly finished sections.

We will now show how most of the objections may be removed or greatly overcome. With a feeder like Mr. Heddon's there need be no trouble whatever from robbers. The reservoir is in the center, and just over it a part of the cover slides back in grooves. There is no contact with the bees, no smoke is needed, no propolis disturbed, and the cover fits so snugly that no odor of honey escapes to attract robbers. The first feeding should be done at dusk, as it puts the bees in an excited state, and this is the time when robbers would make trouble. After the bees have become accustomed to finding honey in the feeder, feeding produces but little, if any excitement, still, at dusk is the best time to feed, as we thus avoid the annoyance of having robber bees follow us from hive to

hive and dive into the feeder reservoir whenever it is opened. Mr. Unterkircher speaks of the bees rushing out and stinging whenever the cover of a hive is raised. We have noticed this same feature. When the cover is taken entirely off the feeder we disturb the bees at their feast, and it seems to anger them. But there is no necessity of removing the covers. When we wish to take off the cases we insert the blade of a pocket knife between the feeder and the upper case, take hold of the handle of the feeder upon that side and lift up and give the knife a twist at the same time, which loosens the feeder. We then puff some smoke in the opening between the feeder and the upper case, set down the smoker and lift off the feeder, placing it corner-wise upon the cover of a neighboring hive. The diagonally opposite corners of the feeder then rest upon the wide projecting cleats nailed to the ends of the cover, and raise the bottom of the feeder from the cover so that no bees are crushed. The man who attempts to feed in a haphazard way, using anything he can pick up for a feeder, spilling honey about, etc., will certainly have trouble with robbers; but the one who goes at it systematically, with the right kind of hives, feeders and utensils, can snap his fingers at the robber bees. In regard to any suspicions that might be created in the minds of consumers by the feeding of honey to have it stored in combs, we would say that the public need know nothing of it. Keep still about it. Don't blab. Producers, manufacturers and dealers in other lines do not herald their methods to the world, why should bee-keepers? In other professions there are "trade secrets," why should bee-keeping be an exception? We have fed back honey for years, feeding thousands of pounds, and yet not a neighbor ever knew of it. We have even had bee-keepers visit us and go away with no suspicions that we were feeding back. We do think that "fed honey" has a slightly different taste from honey stored directly in the combs by the bees, but it is very slight indeed where all the utensils are kept "as neat as wax," and would be noticed only by an expert. We would not advise the heating of the honey. If the water that is used to thin it be heated it is sufficient. This warming and thinning of the honey enables the bees to handle it much more rapidly.

The lengthening of cells, bulging and patching up of combs, has been most graph-

ically described by Dr. Miller, and but little can be added to his directions how to overcome the difficulty. Bees usually have about a $\frac{3}{8}$ space between the combs, and in putting back the unfinished sections we must try and preserve this space. When the space is less than this, no harm is done unless it becomes so small that a bee cannot pass through, when the bees will connect the two surfaces at some points by little bridges of wax, and when the sections are taken apart these little bridges will pull pieces out from one comb or the other. When the space is much greater than $\frac{3}{8}$, and the comb upon each side is sealed, the bees, especially if crowded, will construct comb upon the sealed surface of the other comb, which gives it a very botched appearance. If the comb at one side of the space be sealed, and the other not, the sealed comb will be left undisturbed and the unsealed cells on the opposite side lengthened out until the space between the two combs is reduced to about $\frac{3}{8}$. If, in this instance, the sealed comb should be smooth and even, and in the right place as regards the section as a whole, all will be well; but if it be concave, or convex, the unfinished comb facing it will be drawn out in conformity with the surface of the finished comb. If two unfinished surfaces, in the same stage of completion, are brought facing each other near the center of the super, they will be drawn out and sealed straight and true and alike: if they are near the outside, the chances are that the comb nearest the center of the super will grow faster than the one farther out, and a bulge will be the result. Combs near the center of the super are drawn out quicker and finished sooner than those at the outside and corners: hence we place at the outside those sections that are the nearest completion: especially do we take pains to have sealed surfaces come next to the sides of the super, while combs the farthest from completion are placed in the center. By this arrangement all of the sections in a super are finished at about the same time. Unless some of the combs are beginning to show signs of travel-stain it is better to leave on the super until all, or, at least, nearly all, of the combs are completed, for, as the combs near completion, this matter of adjustment becomes more difficult. Where foundation is used, and comb honey produced, "right from the stump," by feeding extracted honey, we have none of this bulging, patching difficul-

ty to contend with, as the combs all grow alike; and some of the finest, straightest, plumpest, whitest and most handsome comb honey can be produced that the eye ever beheld; but we have never found it profitable, except by placing a few cases on top, near the close of finishing up a lot of unfinished sections, to give the bees room and thus prevent the bulging of combs, as explained in the June REVIEW. In regard to spreading foul brood by feeding back, we do not know that it is practical to overcome this objection. Of course, it would be possible to add something to the honey to destroy the germs, if any should be present. Whether this addition would be objectionable we do not know, but we feel quite certain that most bee-keepers would take the risk rather than go to this trouble. The most that can be done is to be ever on the alert for foul brood. And we may remark, parenthetically, that, considering the prevalence of foul brood, it would be well if every bee-keeper could see a genuine case of it, and for this reason: In its early stages it is very difficult to detect. Or perhaps we should say, scarcely noticeable; and there is a something about its appearance that is very difficult to describe; it must be seen to be comprehended. When over at Mr. Taylor's a short time ago, we were shown colonies that required a very critical examination indeed, to discover any cells containing foul brood. But the tendency of the honey to candy is, in our opinion, the most insurmountable objection to feeding back; especially so if the bees are given only foundation and all of the honey stored is "fed" honey. When the sections are nearly completed, and the feeding is done simply to have them completed and sealed over, the proportion of "fed" honey is so slight that the candying would not be so serious an objection were it not for the fact that the presence of a little candied honey hastens the candying of the whole mass. There is a great difference in honey as regard its candying, and one of our correspondents says that thinning the honey increases its candying propensities. We have fed but very little thick honey. The bees worked it so slowly that we became discouraged and went back to thinning it. We know that they seal it over quicker when it is fed full thickness, and it is possible that this is the better way of feeding it. We must admit that this is a point upon which our experience is limited. We believe that

the best advice that we can give upon this candying point, is to sell the honey early and in a market where it will surely reach the consumer before it candies. Of course we cannot always follow this advice, hence, we consider the increased tendency of the honey to candy, as the greatest objection to feeding back.

Taking one year with another, we have secured about two pounds of comb honey from the feeding of three pounds of extracted. With the right kind of weather and colonies we have done much better; secured four pounds for five; and we shall continue to feed back to secure the completion of unfinished sections; and if others desire to do so, we feel that we have placed before them about all the information obtainable upon the subject.

EXTRACTED.

Feeding Back Extracted Honey.

As far back as in 1881, E. A. Thomas, of Colerain, Mass., tried his hand at feeding back. At that time he was a frequent and valuable contributor to our bee journals, and sent the following to *Gleanings*. Whether he has dropped bee keeping we do not know, but he has certainly dropped the pen, as a letter asking for further particulars brought no response.

Of course bee-keepers should endeavor by every means in their power, to increase the demand for extracted honey at a fair price; but when it falls below that, it must be worked off in some other way. Even if we run for comb honey, there will always be more or less extracted on hand at the end of the season, from unfinished combs and hives that were not strong enough to work in boxes. At the present market prices, in localities where there is but little home demand for extracted, I think it will pay the apiarist to feed it back and let the bees put it into combs. I never had very good success in feeding back until last year, when I adopted a new plan with very good success. I selected one of my strongest, heaviest hives, and took out all the brood except one frame of larvae, nearly ready to seal, and changed them for frames of solid honey from other hives. A colony prepared in this manner will be obliged to put all the honey they get into the boxes, and will not waste any in unnecessary breeding. I then selected the best of my unfinished boxes, and tiered up according to the strength of the stock, giving all the bees a chance to work. I fed from a closed feeder on the outside of the hive, as fast as the bees would take it, keeping honey in the feeder night and day. As fast as the sections were filled I removed them, putting others in their place until all

were finished, when I removed them and changed the combs in the hive back to the bees I took them from. I then gave the stock brood enough to make up for what they had lost while I was feeding them, so that they lost nothing by being fed. Now for the result: Counting the weight of the sections before they were put back, in with the extracted, I found that it took 155 lbs. extracted honey to make 100 lbs. of comb. As I sold my comb honey for 20c. per lb., and as extracted sold slow at 9 and 10c., I think it has paid me to feed back.

E. A. THOMAS.

COLERAIN, MASS., Feb. 1, 1881.

Feeding Back Not Profitable, and Why.

Last year, at the Michigan State Fair, we had the pleasure of competing for premiums with Mr. A. F. Unterkircher, of Manchester, Mich. He is a young German; and his neat and attractive display showed that he possessed push and enterprise. It seems that he has been trying his hand at feeding back, for, two years ago, he sent the following report to *Gleanings*:

On turning to page 443, *Gleanings* for July 1, 1885, we find a communication regarding the feeding back of extracted honey for producing comb honey. Bro. Hutchinson seems to advise the use of separators, and announces that the bees will otherwise often bulge the combs. He has also met some incidental troubles in feeding back for sections. I have had some three seasons of experience in this feeding-back business, but more extensively the past season. We would say that no separators were in use, and never have our bees produced a finer lot of comb honey than was the one produced by this feeding back method during the past season. The combs were bright and clean; the sections well filled. There were a few sections which were very slightly bulged. There was not one mound or projection, to our knowledge, upon the surface of any of the combs. We shall be glad to give you our opinion as to why feeding back is unprofitable. Here is the whole business: Twenty of our strongest colonies were selected for this feeding back purpose. The 20 colonies would not have exceeded 200 lbs., or an average of 10 lbs. per colony to each brood department at the commencement of feeding back, which was comparatively near at hand, Aug. 17, 1885. Many large feeders were made, holding 25 lbs. each. Two sets of sections were placed on each hive, and no more. To the above 20 colonies was fed 3500 lbs. of extracted honey, or an average of 175 lbs. per colony, in 35 days. The total amount of comb honey received from the 3500 lbs. was only 1250 lbs., or 62½ lbs. per colony all in one-pound sections. The total amount for the 20 brood departments was 800 lbs., or 600 lbs. of the 3500 lbs. of extracted honey stored in the 20 hives. Thus the consumption for the 20 colonies in the secretion, or forming of wax scales, and for brood-rearing, evaporation, etc., is that enormous total of 1650

lbs., or 82½ lbs. per colony. To some of these colonies was fed perhaps nearly 150 lbs. ere the first 54 sections were ready to come off. Only they who have tried this experiment know what difficulties one must encounter by turns, the scores of exasperating stings, and the imperious robbers, with their exciting movements and the taking off and refilling of each feeder. All this is certainly enough to disgust one in feeding, to say nothing regarding the loss in the operation. The increase on these 20 colonies is nearly 100 per cent; and as they were used mainly for building up late colonies, this is quite an item.

A. F. UNTERKIRCHER.

MANCHESTER, MICH., JAN. 8, 1885.

We wrote to friend U. for further particulars, and here is his reply:

MANCHESTER, MICH., June 26, 1888.

EDITOR REVIEW:—Yours asking for further information in regard to my experience in feeding back is here, and in reply I would say that foundation, in strips, from three-fourths of an inch to two inches in width, was used in the sections. No separators were used, yet there was scarcely a bulge or projection; and such beautiful, straight, well filled sections. But many of the combs in the lower tier were badly travel-stained, resembling in color our brindle calf. The darker the bees the better were the results obtained.

Each of the twenty colonies had ten frames each in the brood-nest. I am sure better results would have been secured had the brood-nests been reduced to six or seven combs, although I do not think this amount of contraction would have diminished the increase of bees to any great extent. Where only four or five combs are left for the queen, and I think this is about the best number, there is a reduction in the amount of bees raised.

The feeders used were the Heddon style, each holding about 25 lbs.

The honey was thinned by adding ten or fifteen pounds of water to a 100 pound keg of honey; thoroughly mixing it by yanking the keg first this way and then the other, until it answered in a good straight "a-ca-clip," "a-ca-flop."

The Italians engaged in the work were almost beyond control. As soon as a cover was lifted, out would rush the little rascals, and that, too, in spite of a cloud of smoke.

A. F. UNTERKIRCHER.

Feeding Extracted Honey for the Purpose of Getting Comb Honey in Sections.

In the August No. of *Gleanings* for 1880 its editor gives the following bit of excellent advice:

Although this can be done, and with but little loss, comparatively, as I have told you in the A B C, I should regard it as one of the greatest pieces of folly, for a bee-keeper to extract his honey with that end in view. Why not let the bees put it in the sections in the first place, and thus save them and you all the trouble and waste? Another thing, extracted honey is almost sure to acquire a

slightly unpleasant flavor: if it candies before it is fed back, this candying gives it another unpleasant property still, and after it is in the sections nicely sealed over, you have candied honey in the comb, instead of the usual liquid, comb honey. I have had comb honey in sections for the past three years, produced by feeding back extracted honey, and we are now selling it at 15c. retail, while we get 20c. for that stored by the bees in the sections as they brought it in; and if more comb honey produced by feeding should be offered me, I would not give half price for it. If you do not agree with me, try it yourself; but I would advise you to try a little first.

Later on, in the November issue, he gives another hint which we copy:

FEEDING EXTRACTED HONEY TO GET THE BEES TO FILL OUT SECTIONS.

We have had some statements made recently in regard to the matter, that are so different from my own experience (in regard to the loss of honey by so doing), that I would suggest an experiment. Get a pair of platform scales with a dial, capable of recording 100 lbs. Set a hive of bees on the platform, and, in the third story above the frames, put a tin pan full of honey. If there is a loss, the hand of the dial will record it while the bees are taking the honey out of the pan. I have made exactly the above experiment, and the whole apparatus weighed just about as much when the honey was down in the combs as it did when in the pan. I gave the colony 50 lbs. of thick honey, and they weighed so nearly the 50 lbs. more, that there was practically no loss. If you doubt it, try it yourself. For all that, I would not feed to get comb honey, for the reasons I have given in recent numbers.

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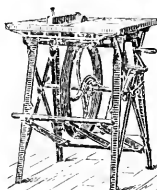
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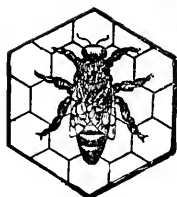
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The Production of Comb Honey.

.....

The production of comb honey is now the order of the day, and the bees employed in its production usually swarm. Upon what are they lived? Sometimes upon empty combs, oftener upon full sheets of foundation, and occasionally they are allowed to build their own combs in the brood-nest.

Four years ago we proved, by a series of extensive experiments, that the latter plan, with proper management, not only saved us the cost of the foundation, but actually enabled us to secure more honey. Since then we have continued to experiment, and the evidence has been in favor of empty frames EVERY TIME.

These experiments were, from time to time, given to the public through the various journals, and many others attempted to follow in the same path. Some followed with no difficulty, and even trod the path wider; while to others it seemed so dim, or so filled with obstructions, that they turned back to the beaten highway. It became evident that everyone could not profitably dispense with full sheets of foundation in the brood-nest when hiving swarms, without making some changes in their fixtures or methods; that the non-use of foundation was only ONE factor of the system we were using; and that, in order to succeed, that system, or, at least, some parts of it, must also be adopted. It likewise became apparent that the system was really more complex than it appeared upon the surface; also that a few short articles, scattered through different journals, did not present the subject in the best possible manner, and finally, one year ago, we wrote and published a little book in which the subject is treated in an exhaustive manner. Other points are touched upon, as is shown by the following list of

CONTENTS.

"Securing Workers for the Harvest;" "Separators;" "Tiering-Up;" "Hiving Swarms on Empty Combs;" "Hiving Swarms on Foundation;" "Hiving Swarms on Empty Frames;" "The Building of Drone Combs;" "What shall be Used in the Sections;" and "Secretion and Utilization of Wax."

Since its publication, more than 2,000 copies have been sold, and only praise comes from those who have put in practice its teachings.

Reader, now is the time to buy this book and put in practice the methods advised; and, if you have been in the habit of hiving swarms upon foundation, or drawn combs, you will, by practicing its teachings, save the price of the book upon each swarm you hive, besides getting more honey into the bargain.

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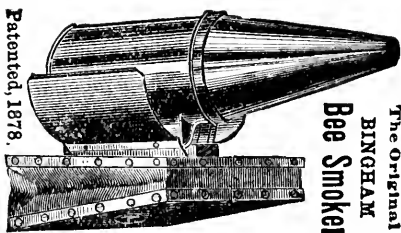
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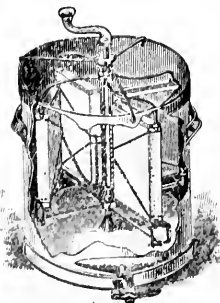
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THE BEE-KEEPERS' REVIEW

VOL. I. FLINT, MICHIGAN, AUGUST 10, 1882. NO. 8.

Fairs the Place to Sell and Advertise Honey.

H. D. CUTTING.

BRO. H. — As you have outlined the points most desirable for discussion, I will take them up in the order given:

1. Are aparian exhibits an advantage or a disadvantage to bee-keeping? I claim that they are a great advantage. In no way can honey be so well disposed of as by bringing it before the people; and where can we find so many together, eager for something new, neat and attractive, as at our large agricultural exhibitions? Many who would never notice honey upon a grocer's counter will stop and look at an exhibit of honey displayed at a fair. They are there to see, and an attractive display is an advertisement long remembered by visitors. They, in turn, advertise it by repeating a description of it many times over upon their return home. There is nothing like a living advertisement. Take, for instance, two merchants in any town, let one cover up his goods and when a customer enters his place of business present him with a circular or catalogue of what he has for sale, let the other have his goods nicely arranged on shelves and counters, and which will sell the most goods?

2. Shall honey be sold at the shows? I must again say, yes. I know, from practical experience, that people who never bought honey at home will buy it at a fair. The time, place and the attractiveness of the exhibit have much to do with it. If given a nice article of honey, it creates a demand for more. After our fairs, I receive many letters from parties who bought honey at that time. All want "some more of that honey." I sold three different lots to one man last year at Jackson, when I know I would not have sold him an ounce had it not been on exhibition and sale at the fair.

3. In what shape honey should be put up depends upon the locality. At some fairs comb honey is the leading feature, then pound sections sell the best. This was the case at Detroit; but, at other places, extracted honey, in glass packages that sell at 10, 15 and 20 cents respectively, take the lead. The package must be attractive, as, in this case, many purchases are made just for the sake of securing the handsome package. As a general thing, I sell ten times as much extracted as comb honey.

There is nothing that shows off extracted honey so well as nice glass packages with

neat and tasty labels. The common or green glass will kill the sale of extracted honey every time. The glass must be white, or flint, glass. Too large or gaudy labels gives the honey the appearance of canned goods. Comb honey in pound sections will take care of itself. Beeswax for exhibition, if the exhibitor is desirous of making sales, should be in small cakes that will sell at five and ten cents; if for exhibition only, then in one or more large cakes.

4. Bees on exhibition attract great attention, provided, they are in such shape that they can be seen and HANDLED by visitors. If the exhibition of full colonies could be done away with, and, in their place, have a single frame nucleus, protected by glass, and showing bees, queen, brood, etc., etc., it would add much to the attractiveness of any aparian exhibition.

5. This calls for a great deal. A book the size of the REVIEW might be written upon this one point. The packing of goods for an exhibition requires experience, patience and care. I have seen more than one fine exhibit ruined as the result of improper packing. The putting up and arranging of an exhibit is entirely dependent upon the circumstances, location, light, space, etc., and, above all, upon the taste of an exhibitor.

6. Shall the awarding of premiums be the work of a committee of three, or shall it be left to one expert? I think, in the majority of cases, the expert system gives better satisfaction; especially so at ordinary exhibitions like state and county fairs. In the case of very large exhibitions, it may be well to have more than one judge; but, if a judge will adopt a scale of points by which to be governed, he will seldom go astray. I find that the expert system is growing in favor and being adopted by many associations. One judge can do the work in much less time than is required by three, thus lessening the expense to the fair association.

7. This is a "sticker." We always feel a little delicacy about offering suggestions when we don't know exactly what some one else wishes to know. We will say this much to the beginner, don't attempt too much but make the exhibit neat and attractive and put it up where it will show to as good an advantage as the space will admit. Don't expect too much and if the other fellow gets the premium take it all in good part and notice just why you were beaten and profit by it another year. If you keep your eyes open you will learn something new each year. Make

a note of it, and, when you go again, take advantage of it: it takes years to become an expert exhibitor. Above all things, if you don't take all the premiums don't get mad and refuse to ever again make an exhibit. We cannot all receive premiums upon the same thing. If you can't get all the premiums, why, get all the fun you can; that makes a man feel better than to get a premium. There is always more fun than premiums.

CLINTON, MICH.

July 30, 1888.

Bee-Culture and Our Fairs

PROP. A. J. COOK.

I believe that, next to bee-pasturage and the improvement of bees by careful breeding, nothing offers better hopes for progress than exhibitions at our state and district fairs.

The first effect will be to improve bee-keepers themselves, as to the best methods, so that in our local markets we shall not have to compete in price with ungraded, untidy and often unwholesome honey. It is especially desirable, in our industry, that the markets shall not suffer by the invasion of honey wholly unfit for market.

Again, such exhibits enlighten the public. The people see that the bee-keeping art is worthy of respect; they learn that honey is pleasant to both the eye and the taste; they also learn what foundation and extracted honey are; and the too frequent absurdities about adulteration, which so often dishonor our newspapers and periodicals, will lose their power for evil if not their existence.

Lastly, our best bee-keepers, would they generally compete, would find their methods improved and their strength, physical mental and moral, greatly improved.

Of course, we need a reform all along the line, in the exhibitions. We need, and must have, a generous premium list, a separate building and the privilege of selling honey and wares; with the understanding, however, that the exhibition is not to be injured by such transactions.

AGRICULTURAL COLLEGE, MICH., July 24, '88.

Apian Exhibits at Fairs.

JAMES HEDDION.

So far as my observation goes, I have been, and still am, of the opinion that these exhibits have been beneficial to the supply dealers but detrimental to honey producers. I have always been opposed to them, and am opposed to them now.

Perhaps, since obtaining my patent on the New Hive, I am more interested, financially, in supplies than in honey production; although I am running three apiaries devoted almost exclusively to the production of comb and extracted honey, the rearing and selling of queens and bees being only a side issue with me, never having desired to do more in this direction than to supply the demands from those who specially desired my stock. However, facts remain just the same, and it

is my opinion that any honey producer who encourages exhibits at fairs, managed as in the past, works against his own interests. Piles of beautiful honey are usually exhibited by certain persons who may or may not deal in supplies themselves, but the supply dealers present, exhibiting their wares, are there to point at this honey with one index finger and to their hives extractors, bee-feeders, etc. with the other, while the honey may have cost four times what it will bring in the market; or, if not, it is more than likely that it was produced in some other hive than any of those on exhibition, for it is a notable fact that, as a rule, the most worthless hives are the most industriously exhibited at fairs.

Were these exhibits strictly in the line of comb or extracted honey, and the truth told to visitors, viz., that the best of implements, skill, patience and industry, even unto long hours of hard work, are required to make the business of honey producing profitable, then something might be done to increase the consumption of the products of the apiary, without also inducing more people to go into the business. Just here, you see, the interests of honey producers and supply dealers clash. The supply dealer, especially of Jim Crow manufactures, wants, not only increased numbers of customers, but new and unsophisticated bee-keepers upon which to palm off his wares; having learned that they don't take well with the experienced, successful bee-keeper.

In your editorial upon this subject, in the last issue, you have touched many of the points which have caused me to believe that exhibits at fairs are detrimental to the interests of honey producers. Exhibits of honey at fairs might be both directly and indirectly beneficial to the producer. Without attempting to describe any of the receptacles in which I would place it, I would simply say, put it up in the smallest quantities, have it attractive in appearance and free from dirt and dross. No, do not exhibit live bees at fairs; they are usually a nuisance from first to last. Leave the awarding of premiums to one man and be sure that he is an expert and perfectly honest.

After all, may it not be true that the same amount of energy expended at fairs, could be more wisely put into the regular honey trade?

I am quite certain that such is the case, and would soon be so believed by all, were it not for the premiums which often pay for all the time and money expended in making the exhibit.

DOWAGIAC, MICH.

July 14, 1888.

Honey Exhibitions; By Whom They Should be Made.

M. M. BALDRIDGE.

I desire to place myself upon record as being decidedly opposed to honey exhibitions at fairs, or elsewhere, whenever the sole or chief object is to encourage Tom, Dick and Harry to engage in honey production. The main object of such exhibitions, if held at all, should be to encourage the consumption of honey; and no effort should be made, especially on the part of producers, to increase

its production by rehearsing, to would-be beginners, stories of immense profits. The parties in charge of honey exhibitions should be honey producers, and such only as are thoroughly posted in regard to what is proper to say to consumers—particularly to those suffering from an incipient attack of bee-fever. When thus conducted, honey exhibitions would be of more or less value to honey producers, but not otherwise.

In the past, these honey exhibitions have been conducted, mainly, in the interests of supply dealers, and not in the interests of the then existing honey producers. This being the case, I consider it my duty to call the special attention of the present honey producing fraternity to the fact: and the necessity, in the future, of a radical change in this matter.

ST CHARLES, ILLS.

Dec., 19, 1887.

Bees and Honey at Fairs.

M. H. HUNT.

Visitors to my yard always buy honey after going through the honey house, factory, etc. It seems to convince them that bee-keeping is quite a business, and they usually express themselves as being surprised at the expense necessary to produce honey. This idea gives them a more exalted opinion of the value of our production, as well as the importance of our industry. So far as my experience goes, exhibits at fairs have the same effect.

An exhibit of nice honey, supplies, wax, etc., tastefully arranged, cannot help benefiting our business. It is a first class advertisement, and, in this fast age, we must advertise if we expect to do business.

I have always sold honey at the fairs I have attended, and, as tastes differ, I find that clean packages of almost any description will sell. Use the best labels, and, to avoid selling them, do not put them on until after unpacking at the grounds. Cast wax in some fancy shaped mould; and, to prevent cracking, cool as slowly as possible.

I have never been in favor of taking full colonies of bees to fairs. I have always lost those taken. The best arrangement shows only the outside combs: one frame with a queen and a few bees will show more than a full colony.

A judge should be thoroughly posted in the business, and it is difficult to secure the services of three such men. One judge, and he an expert, has given better satisfaction at our state fairs. Unless called upon to do so, exhibitors should avoid all conversation with the judge in regard to anything on exhibition.

No premiums should be given on hives. The prejudice in regard to them is something wonderful.

In order to avoid mistakes by hurrying at the last moment, have everything packed ready to ship at least a week before the time to leave.

In packing bees, make the frame to which the wire screen is tacked at least four inches high above the frames. This gives room for the bees to cluster in when too warm.

As there are always bees close enough to make trouble, honey should all be so arranged that bees cannot get at it.

I have found it best to take extracted honey in bulk, and fill small receptacles on the grounds: by so doing, packages are never daubed by leakage or breakage. To have extracted honey nice and clear, heat it before leaving home.

Have everything clean and dry that is to hold honey: if packed damp, there will be a disagreeable odor about the packages.

If much space is required, it should be secured in advance.

BELL BRANCH, MICH.

July 25, 1888.

Showing and Selling Honey at Fairs.

R. F. HOLTERMAN.

These exhibitions bring honey in large quantities right before the public. The people see that honey in ten pound lots is not a wonder. That it is not something that can be bought only by the pound at the druggists in case of sickness, but it is secured in large quantities, by the tons and tens of tons. Such exhibitions make people reflect that honey is consumed in large quantities as food, and to think means to act.

The demand for honey is increased by selling it on the grounds. We have a little two ounce package, costing about one cent, that we sell, filled with honey, for five cents. All classes buy it, the honey speaks for itself, and the children will say: "Ma, get us some more honey like that we bought." As to business packages, don't have them too small. Educate the people to buy five and ten pound packages. If there are no others, they will buy them. I have frequently sold thirty and sixty pound cans to families. The public greatly prefers liquid to granulated honey. An exhibitor whose honey is granulated, or partly so, will be passed by: the clear, liquid honey of his neighbor being more attractive. It is well to exhibit some granulated honey, as it educates the public in regard to this point, and frees the liquid honey from condemnation when it does candy, after purchasing. Store-keepers, who may be visiting the fair, see the trade that may be carried on in honey, and it strikes them that they might as well do this trade, and they step up and ask for quotations, and the bee-keeper is again enlarging his market. Comb honey should be put up in crates of varying sizes. These sell well just as families are leaving for home.

Do not cut up honey as we have done, selling $\frac{1}{4}$ of a cull section for five cents. It pays in one way, but not in another. It makes a nasty, sticky mess on the floor and hand rails.

Taking full colonies of bees to an exhibition is of no use: it only adds to the number of bees that will fly about an exhibition. But, though no bees are on exhibition, there are usually some in the vicinity, and all honey must be exhibited in such shape that the bees cannot gain access to it.

It is interesting to have a case which will hold one comb having, say, queen cells or their stumps, drone comb, worker comb,

honey, sealed and unsealed brood, and a few workers, drones and a queen. This is really more interesting than a full colony; and, right here, let me say that, by kindly, attentive, and gentlemanly deportment, friends to the bee keeping industry can be made and an advertisement secured for honey. No matter how tired you are, how many times you have told over the same old story, be courteous.

Always carry hammer, saw, chisel, etc., and a variety of nails, and above all things know where to find them. It is difficult to borrow, and nothing can be bought without going a long distance. Mark each box with the name of its contents. When unpacking, put the packing material back in the boxes, and then take care of the boxes: try and utilize them if possible in making the exhibit. As much as possible fill all honey extractors and hives with small articles.

I am strongly opposed to having only one judge. There is scarcely a man who has not an incorrect hobby upon some question, and with three we are more apt to get a fair decision.

Be on the grounds early. Even though space has been secured, it may not all be reserved unless you are there and in possession. If you are selling honey watch the newsboys and urchins or they will soon steal away your profits.

BRANTFORD, Canada, July 23, 1888.

Arrangement of Apairian Exhibits at Fairs.

DR. A. B. MASON.

You ask me to tell those just thinking of making their first exhibit of bees, honey, etc., at fairs this fall, how to do it. I just don't like to do so for I might be telling some one how to take the premiums away from me at some place where I might want to exhibit. Those having seen the premium lists of the Michigan State Fair and of the Tri-State Fair, at Toledo, O., may have noticed that the largest premiums offered were for the "most attractive display of comb honey," and the same for extracted honey. I believe Mr. Cutting, at any rate some Michigan bee keeper, I believe, started this way of wording the list, and it seems to me to be just the way to word it, the object being to make the exhibits as attractive as possible, leaving each exhibitor to arrange the exhibit as may suit the fancy. Some prefer shelves, and some prefer to pile up honey, etc., in the form of a pyramid. As comb honey must usually be exhibited in crates so as to be kept out of the way of the marauding bees in the neighborhood of the fair grounds, it cannot be so put up as to show to the best advantage. At the Ohio Centennial to be held at Columbus from Sept. 4 to Oct. 15 next, it is intended to have all exhibits so enclosed with wire cloth as to keep out all bees, and then the comb honey can be displayed to the very best advantage, and if a permanent place is available it might be desirable to enclose that portion of the allotted space designed for the exhibition of comb honey with wire cloth. The color of the wire cloth will have to be such as not to obstruct

the view. The impression seems to prevail with those with no experience that it is desirable to have the light admitted to the building in the rear of the honey, but after three years trial of that method here at Toledo, we have done away with it, and the light is admitted at the roof and by the open doors. An exhibit of bees and queens is always attractive, if so displayed as to be readily seen, and it is amusing to hear the odd expressions made by those not posted in bee matters.

In exhibiting full colonies it is desirable to give plenty of room and air. This may be accomplished by making a hive two inches higher or deeper than usual, and having that much space below the frames, and have this ventilated, covering most of the top with wire cloth.

Bees should not be allowed to fly, unless it can be done with perfect safety to every one on the grounds, for one sting sometimes makes a BIG DISPLAY and occasionally a show that is not in the interest of bee and honey shows, especially if any of the officers or their friends are the sufferers. As so much has been said about adulteration of honey, it is desirable to have one or more bee-keepers always at hand to answer the "thousand and one" questions that are asked, and when necessary give out one of the cards so generously furnished free by our friend A. I. Root, in which he offers \$1,000 for such information as will show where artificial comb honey is made.

BEES AND HONEY are THE attraction, but beeswax and some other things may be so arranged and displayed as to be attractive, and as to how much so, will depend wholly upon the taste and ability of the exhibitor.

AUBURNDALE, O.,

Aug. 4, 1888.

Exhibits of Honey, &c., at Fairs.

J. H. MARTIN.

My experience in exhibiting at county fairs extends over a term of several years. I have usually made a large display and used every effort to attract people's attention to my articles. My first exhibit was made with a view to advertise my business and let bee-keepers in particular know that I manufactured hives and dealt in supplies. The premiums were small, as they usually are at county fairs, but by an effort before the committee for revising the premium list, I succeeded in raising the premiums to over \$20; and, as I took \$17, in first premiums, I felt that, in premiums alone, I had pay for my time.

My displays have been varied, and, though not exhibiting every year, they have always drawn much attention. I find a single comb observatory hive, adjusted so as to turn upon a pivot, a great center of attraction from the fact that the queen can be seen. There are but few persons who ever saw the queen of a hive. During exhibition hours the exhibitor is kept very busy answering questions in relation to the various branches of bee culture; and the influence is excellent if the exhibitor answers in a candid and truthful manner. If only one person in one hundred has

enough interest and capacity to absorb the instruction given, that one will impart the facts to a large circle of friends, and will always find it as something interesting to talk about.

One of the main objects in an exhibit should be the sale of honey. The direct sales may not amount to a very large sum but if the fairs are used and followed up in an enterprising way, such as any merchant would adopt to present his goods to the public, a large trade would result. If bee keepers in a great majority of counties would combine and work up this promising field of trade, there would be but little honey left to be shipped to the city markets.

The packages that sell most readily at fairs are the pound section and five and ten lb. pails of extracted honey. I have studied much upon a small five cent package for extracted honey, and devised a package made of tin foil like a common paint tube. Fill with honey and allow it to candy, then pressure at the lower end causes the honey to protrude at the top, where it can be bitten off. This package is, however, too expensive and cannot at present be supplied.

I have much faith in the Harmer five cent package for comb honey, when it can be made more rapidly. Such a package will sell rapidly in any crowd. I expect further developments in this line in the future, and look upon Weed's deep cell honey comb as an important factor.

I think there is little danger to be apprehended from a large exhibit inducing others to engage in the business. Nearly all that have made inquiries, with a view to take up the business as a pursuit, have previously had their interest awakened by reading some glowing account, in some agricultural paper, or the great profit from a swarm of bees. Or the fever has been induced by a Lizzie Cotton circular.

Honey both comb and extracted should be exhibited under glass. If the premium is for the greatest yield from a single colony, a great spread of the sections can be made in crates with one or two sections deep and six in length. Extracted honey shows well in glass fruit jars. Six in an open sided crate, having them all snugly crated, saves much handling of individual pieces.

Usually, judges at a county fair are not chosen for their knowledge of bee culture, and premiums have often been awarded to a rough twelve pound box in preference to a rate of sections, and a box hive has been more appreciated than a Langstroth.

It is the practice of some counties, where bee exhibits are fostered by the management, to call in one, two, or three disinterested experts. Wherever this has been done there is but little cause for complaint from the various exhibitors.

To summarize, it pays in extending your reputation; educates people in relation to the methods employed to produce honey; makes sales for honey in bulk, or large packages; and, not the least, it gets the beekeeper himself out of his old rut and into the enjoyment of a holiday season.

The + Bee-Keepers' + Review, PUBLISHED MONTHLY.

W. Z. HUTOHINSON, Editor & Proprietor.

TERMS:—50 cents a year in advance, two copies for 95 cents; three for \$1.35; five for \$2.00; ten or more, 35 cents each; all to be sent to ONE POST OFFICE. In clubs to different post offices, NOT LESS than 45 cents each.

FLINT, MICHIGAN, AUGUST 10, 1888.

AWARDING THE PREMIUMS IN THE APIARIAN
DEPT. AT THE MICH. STATE FAIR.

To our friend, M. H. Hunt, of Bell Branch, Mich., has fallen this difficult and delicate task. Mr. Hunt has had a large experience as bee-keeper, supply dealer and exhibitor, and the securing of his services as judge was a stroke of wisdom upon the part of some one.

MR. WEED AND HIS ARTIFICIAL COMB.

Mr. Weed writes us that he has been seriously ill with malarial fever, and many things of importance have been neglected. Some of his patents are still pending, hence he does not yet wish his machine and its mode of operation described. He thinks that, within a month or two, he will be ready to allow a description to appear; in fact, the Michigan Farmer is our authority for saying that the machine will be on exhibition at our coming Mich. State Fair.

WILEY LACKS MANHOOD.

Prof. W. A. Wiley has received so vigorous a trouncing from the bee-journals, particularly from the A. B. J., that he has at last forsaken his dignified silence, and attempted—well, it is hard to say what. It is a mixture of defense, explanation and confession, in which the contradictions and inconsistencies are pitably ludicrous. It seems that he lacks the manhood to come right out and own up without any quibble, and do what he can to repair the damage he has done. Such confessions as he has already made awaken only contempt and disgust.

THE NEXT MEETING OF THE NORTH AMERICAN
BEE-KEEPERS' SOCIETY.

The executive board of the N. A. B. K. S. has at last decided upon Oct. 3—5 as the date for the next convention, to be held at Colum-

bus, Ohio. Sept. would probably have furnished a greater reduction in fares, (although this is by no means certain) but it is emphatically a "fair" month; everybody is either going to one or more fairs, or else getting ready to go.

Now comes the work of getting up the programme; and we shall be very thankful indeed for suggestions as to topics and the mention of suitable persons for leading in their discussion.

crowded out at the entrance most of the time. Some of you may think this an expensive way of getting cells; but, try it once; and when you come to cutting them out you will consider it cheap. The bees build a large number of cells, the queens hatch about a day sooner and begin laying sooner; besides, they are large, strong and well developed. We would just as soon have queens reared in this manner, during the next two months, as any we ever had.

INDIVIDUAL VS. MANUFACTURERS' "RIGHTS."

The only defense attempted by friend Root, of Gleanings, in reply to our criticism of his peculiar views upon patents, is that it is the sale of "individual" rights to which he is opposed. He explains that he does not consider it improper for an inventor to sell the right to a manufacturer who expects to make the article for sale. Now, by what species of reasoning, or sophistry, Mr. Root can arrive at such a conclusion, is truly perplexing. Just look at it. To sell a man a right to make an article for his own use is wrong, to sell him the right to make it to sell to others is perfectly proper. We give it up.

STATISTICS—POOR SEASON—ENCOURAGEMENTS.

We have been so outspoken in our criticism of Gleanings, that we consider it not only justice but a pleasure to speak in commendation of its work in securing statistics. If reports from only five correspondents in each state will furnish us with sufficient data, and it certainly has that appearance now, then a vast amount of labor and expense is saved that would be incurred were there a correspondent in each county. The last lot of reports, sent in the fore part of July, indicate that the present season is to be the poorest for honey that has been known for years. The shortage is wide-spread and almost universal. Now, the knowledge that may be gained from these statistics will prevent the man who has a little crop from fooling it away; will enable him to market it understandingly. The plan of having statistics gathered in this manner was brought out at the last meeting of the N. A. B. K. S., and is probably the most valuable idea to which that convention gave birth. We congratulate Mr. Root upon the successful manner in which he has carried out the idea. By the way, Mr. Jones has been trying his hand at getting statistics, in Canada, and it appears that our brethren over the border are reaping harvests no richer than ours.

THE JONES METHOD OF GETTING QUEEN CELLS.

There is probably no better time than in Aug. and Sept. for re-queening an apiary, or introducing new blood by the purchase of a few queens. At this time of the year queens are plenty and cheap, the bee-keeper has time to attend to their introduction, while the leaving of a colony queenless a few days is less objectionable than it would be before the honey harvest. Considerable care is necessary, however, to rear good queens at this season of the year. Simply removing the queen from a colony seldom results in securing the best of queens at any time of the year; queens thus reared after the honey harvest is over and past are "pretty poor sticks." We have always raised the finest queens, at any time, by the Jones method.

Take all the brood and the queen from a colony, giving it a nice comb in which eggs from a choice queen are just hatching, cutting a few holes in the comb, then shake all the bees from half the combs of two or three colonies, in front of the hive where the cells are to be built. We thus get a great mass of bees with only a few larvae to feed; the hive is jammed so full that some of the bees are

A few friends have written us letters of condolence, in which fears have been expressed that this poor season would have a disastrous effect upon the REVIEW. Fear not friends, the REVIEW was not designed for the butterfly class of bee-keepers—those who pick up bee-keeping one year and drop it the next, or with the first failure—but for those who are in the business to stay; who would no more think of dropping their newspapers because of a failure in the honey crop than would a farmer of stopping his agricultural journals in a poor season. It is at such times that a man needs all available

knowledge. Two poor seasons in succession leave heavy burdens upon the shoulders of individual bee-keepers; but, for their effect upon the pursuit, we are almost ready to welcome them. They will clean up the markets, raise prices, teach bee-keepers that honey costs something, drive out dabblers and silence the gushers for at least several years. These things are encouraging to the regular honey producer, as, according to the law of chances, good seasons will soon be here; and the men who are in the business when they come will be the so-called lucky ones. Many will doubtless become discouraged and offer their bees at ridiculously low prices, but, at the risk of being called a "gusher" ourselves, we must say that we never saw the time when we would sooner invest money in bees than between now and the opening of the next honey harvest. Don't lose your heads brethren, simply because you got so little honey the last two years. To help tide over these poor seasons, some advise bee-keepers to mix some other occupation with that of bee-keeping. If the specialist does not do enough better to enable him to successfully pass through poor seasons, then there is no advantage in specialty; or else bee-keeping is an undesirable occupation.

THE REVIEW A "HOME-MADE" PAPER.

In one corner of the front parlor of the Hutchinson "mansion," which edifice, by the way, is an old-fashioned one, built thirty or forty years ago, and surrounded by wide verandas and a perfect grove of shade trees; as we were saying, in one corner of the front parlor stands a marble-topped table; not such as are usually found in parlors, but large and square: it is what printers call an "imposing stone." In another corner stands a home-made rack upon which are type cases: some of the cases, those for holding the display type for "ads.," also being home-made. In another corner is a paper cutter, while the editorial desk and book-case combined rears its lofty form in the remaining corner. The floor is painted, and there are curtains at the windows, and, being a part of the house, Mrs. H. feels it her duty to keep it neat and clean; and when brother printers call, those who have seen the usual dust, dirt and grime of the ordinary printing office, they usually exclaim: "Why, what a neat little office you have." Yes, my friends, for the past three months, with the exception of the

press work, the REVIEW has been entirely home-made. "We" not only write the editorials and prepare the copy, but set the type and "make up" the "forms." Mrs. "We" addresses the wrappers and stitches the papers after our little daughters have folded them; she also wraps up for the mail all the papers that are left after the little girls "get tired" of that part of the business. We do the work because we really enjoy it, and because it enables us to save the profit that would otherwise go to the printer.

We do not know that this item will help anyone to become a better bee-keeper, but we know that it is pleasant to catch a glimpse of the home life of a paper in which we are interested.

SWEET AND ALSIKE CLOVER.

In our "Planting for Honey" number, some thought that we did not do justice to the raising of plants for honey; that we dressed it in too somber colors. We still think that it was shown in its true colors. Here are two little items upon the bright side, however, and we are glad to give them.

While riding in the cars lately, we occupied a seat in company with a young physician who keeps bees in a small way in an adjoining county. In response to our doleful tale of few swarms and scarcely any honey, he regaled us with a report of hives full of honey and swarms more numerous than desirable. After enjoying our surprise to his heart's content, he finally let it out that all these happy results came from a sixty acre field of Alsike. We must not forget, though, that he had only a few colonies; still, we think, and have always believed, that the introduction of Alsike, in large quantities, among the farmers surrounding an apiary, is an advantage to the owner of the apiary, especially where there is no basswood, provided it does not bring with it a crop of bee-keepers.

The other item is a clipping from a letter received by us, July 27, from Dr. A. B. Mason. It reads as follows: "I was 'awful 'fraid' we shouldn't have honey enough to make a display at the fairs, but, the bees are just booming, sweet clover is in all its glory, the weather is 'just the ticket,' so, I guess we'll 'get there.'"

Just as we were ready to make up the "forms" the following came on a postal from our friend A. Snyder, of Coeyman's Hollow, N. Y. "After testing sweet clover

again this season, I think more of it than I ever did. Basswood was a complete failure and, had it not been for sweet clover, we Albany Co. bee-keepers would not have had any honey. It is such a wonderfully good honey plant that I am saving large quantities of seed.

FOOD AND ITS RELATION TO THE WINTERING
OF BEES.

In the Southern States, and other places not blessed with a stern winter, where the bees can enjoy frequent flights, it matters little what the food, so long as it is not actually poisonous. By this we mean, any kind of sweet, like sugar, honey, or even honey-dew, will answer as winter food. In these mild climates little or no protection is needed, but, as higher latitudes are reached, chaff hives are needed and there must be some care exercised in regard to food. As we journey still farther from the equator, it is only cellars and the best of food that bring forth uniform results. It will be seen that to know when the bees have good food is really an important point here in the North. We have often wondered if the character of honey as a winter food for bees might not be determined by a chemical or microscopical examination. If so, then a bee-keeper could have his honey examined in the fall by an expert, and, if it proved unfit, extract it, and feed sugar, or other honey that was desirable. We wrote to Prof. Cook, asking his views upon this point. He replied as follows:

"I feel certain that, at present, no test could assure us that honey was absolutely safe. We do not even know why it is not safe. We know sugar is. At present, I think the best we can say is, that honey which suits us and buyers will likely be wholesome to bees. Honey that we would not eat or sell should not be used in winter. Again, we know that sugar syrup is safe. We cannot say that of any honey for certain.

A. J. Cook."

The Professor's advice is good; yet we know that bees have died with dysentery in its worst form when they had, as food, honey that, to our taste, would be unsurpassed. Then again, they have been wintered successfully upon honey-dew. In our opinion food is the pivotal point upon which turns the wintering of bees in our Northern States; but, if food is the fulcrum, then temperature is the long end of the lever. Prof. Cook says sugar is a safe food, and we agree with him, in fact, we believe this is so well nigh

universally admitted that it needs no discussion, but there are objections to its use. Every pound of sugar fed puts a pound more of honey upon the market; the work of feeding the sugar is something; the bee-keeper often has a crop of honey that is meeting with slow sale, and he has not the money to invest in sugar; while some object to its use on the ground that it lends vigor to the cry of "adulteration." Now the question is, shall we feed sugar to our bees, or will it be better, in the long run, to take our chances with honey, even though we do occasionally lose nearly all of our bees? There is, of course, a difference in localities; and where one has successfully pursued the same course year after year, it is doubtful if a change would be desirable; but what shall the man do who loses heavily nearly every winter? If he does not wish to use sugar, a change in his management that will leave a different kind of honey in his hives for winter may bring good results. O. O. Poppleton, in an excellent article published a year ago in *Gleanings*, took the ground that the best honey for winter was that secured during the most bountiful yield. If the yield from any source was light, the honey thus secured was inferior. There, friends, we have opened the discussion upon "Food and its Relation to the Wintering of Bees," will you please continue it, and we will devote the September *Review* especially to this topic.

BEE-KEEPING EXHIBITS AT FAIRS.

Without a dissenting voice, all our correspondents agree that the exhibition of honey at fairs is an advantage to bee-keepers. The producer and consumer are brought face to face. The public receives a great object lesson in regard to the beauty, excellence and sweetness of honey. At a fair, people are abroad with a disposition for sight-seeing, investigation and the purchase of novelties and nicknacks; and a fine display of honey, together with its sale in fancy packages, cannot help benefiting the exhibitor as well as the pursuit. In a private letter accompanying his excellent article in this issue, Mr. J. H. Martin says: "Bee-keepers do not push their business as other business men push theirs." Mr. Martin is correct. They forget that honey is a luxury, that it must be pushed, advertised and kept in sight; and Mr. Martin, and the rest of us, often forget that all bee-keepers are not salesmen. To secure a

big crop of honey, and to sell it at a high price, requires an entirely different set of qualifications; although we often find them happily united in one man. The bee-keeper who is no salesman, and cannot acquire the art, must allow others to sell his honey while he puts all his energies into its production; but, as the sale of honey comes at a different time of the year from its production, it is an excellent plan for those who possess the proper qualifications and advantages to turn their attention to its sale when its production no longer requires their care. The fall fairs are certainly an excellent place at which to sell and advertise honey; but Mr. Heddon very pertinently remarks: "May it not be true that the same amount of energy expended at these fairs could be more wisely put into the regular honey trade? He thinks, were it not for the premiums, bee-keepers would not find it profitable to make exhibitions. This idea is worthy of consideration. We think all would depend upon the exhibitor. But we must take things as we find them. Premiums are given; and it is very seldom that an exhibitor does not receive premiums enough to at least pay his expenses; while, as a rule, the premiums received are sufficient to pay the expenses several times over. But, as we said in the July issue, we do not care to discuss this question at any great length from the point of benefit to the individual exhibitor; what we wish decided is, are these shows a benefit to bee-keeping? The decision is that the exhibition of honey is an advantage, and should be encouraged. Full colonies of bees are objected to, and, we believe, with good reason. A single frame nucleus with a queen and a few drones and workers, together with brood in different stages of development, can be made to show more that is really interesting, than can be shown with a full colony. We would have bees left out of the premium list entirely; and, instead, we would offer premiums for the most useful, instructive exhibitions. For instance, we would offer a liberal premium to the one who would the most clearly explain and illustrate to the public the operation of extracting honey; which might be performed something after this fashion: have an extractor, a hive filled with tough, old combs, an uncapping knife, and a "sprinkler" filled with water. Show visitors how the combs hang in the hive. Explain that the bees fill the cells with honey and cap it over. Then remove some of the combs and explain how the bees may be

shaken and brushed off. Then exhibit the uncapping knife and show how, by its use, the cappings are removed. Next, lay down a comb and, by holding the "sprinkler" at quite a little distance above it, the water will fall with sufficient force to enter and fill the cells. Now hold up the comb and say: "We will now imagine that the water is honey, and that we have just shaved off the cappings." Close the performance by placing the comb in the extractor and giving it a triumphant whirl. The visitor must be dull indeed who would not ever after know what is meant by extracted honey. This illustrates what we would have done in the way of getting out of the old ruts. As to the exhibition of "supplies," and the offering of premiums upon them, there is a difference of opinion. Our agricultural societies are all dropping the giving of premiums upon implements. Space is allowed for their display but no premiums offered. We notice that the Mich. State Agricultural Society has, this year, dropped out the premiums on apiarian implements. We presume that "supplies must go," except as they are shown by enterprising dealers. Now a word about premium lists. Let there be no premiums offered upon anything that cannot be shown by the article itself. Don't ask the judge to take the word of exhibitors, by offering premiums on "the largest yield from a single colony," or for "the greatest number of samples of different kinds of extracted honey." Also leave out all such provisos as: "honey must be of this year's raising;" "raised by exhibitor;" etc.

EXTRACTED.

Shall We Attend Agricultural Fairs?

AND SHALL WE TAKE TIME TO MAKE AN EXHIBIT OF THE PRODUCTS OF OUR OWN INDUSTRY?

But few persons have had more experience with bees and honey at fairs than has our old friend, Dr. A. B. Mason, of Auburndale, O. In the last number of *Gleanings* he gives his views upon the subject, and from that article we make the following extracts:

These exhibits aid us in our efforts to popularize the use of honey as food and medicine. They will also help to raise the standard of excellence, both quality and attractiveness of the honey put upon the market. New ideas will be disseminated, new methods will be learned, and old ones discarded.

I don't care to aid in getting up displays of honey, etc., for the purpose of inducing people to engage in this, to some, pleasant and lucrative employment, but do it for the same purpose the manufacturers, merchants, and other business men show their goods—to advertise, work up a market, and sell the products of the business.

The premium lists of the fairs are generally made up during the first two or three months of the year; and unless some one or more bee-keepers in the locality see to it, it is more than probable that no premiums will be offered for the displays of the products of the apiary. It may not be too late now to have the matter arranged in many localities, even if the premium-list has been made up, if the proper officers (president or secretary) are spoken to at once. Don't get the premiums too high to start on, but work them up gradually each year as the display becomes larger and more attractive. As a rule, the matter is not thought of by those who make up the list.

A display of bees and queens is always "in order," and calls forth more quaint and original expressions from a crowd of sight-seers than even the extractor does.

Supplies are viewed with curiosity; but honey, that "sweetest of sweets, excepting the lasses we all love to greet," is the great attraction, and creates a desire to taste that which to many is so irresistible that a purchase has to be made before the visitor is satisfied, and then, when leaving, frequently turns and casts longing glances at the tempting display of luscious sweetness.

If all county and State agricultural societies cannot be induced to give fair premiums for the products of the apiary, without doubt enough can be secured to more than pay expenses; but some one or more bee-keepers must look after the matter, and be sure that it is attended to. It will not take care of itself.

The exhibition of bees on the wing at fairs crowded with people has not usually proved to be much of a success. The candy and fruit men are frequently annoyed by bees from the neighborhood, and it is always laid to the bees on exhibition, when, in fact, every bee is confined to its hive.

The question with us all very properly arises, "Does it pay to be to all this expense and trouble?" The same question very naturally arises, also, in regard to any kind of an exhibit at fairs, and each will have to answer the question for himself.

On page 221 of *Gleanings* for 1887, J. H. Martin puts this matter before us very nicely. He says, "Does it pay to spend time and money to advertise the honey business? If we look around us, we see every trade making strenuous efforts to get ahead. Take up the most obscure county paper, and every trade is represented in its columns. Our most successful merchants are the ones who 'catch on' to every advertising novelty to be used in the extension of their business. Our fairs are the red-hot centers of attraction and advertising, through all lines of business, with the exception, perhaps, of bee-keeping.

"Probably the hardest thing for a spirited

bee-keeper to bear, at the present time, is the general belief that bee keeping is a small business, and that any ninny who knows just enough to chew gum can successfully produce honey; and bee-keepers, as a rule, are following a course of action to confirm people in that belief; for if a business is not worth a little advertising effort, it is not much of a business."

It seems to me that a few bee-keepers in each county where honey is produced can make it pay to be to the necessary expense and trouble of making a nice and attractive exhibit. To be sure, it has to be "mixed with taste and brains," and that is just what every successful bee-keeper, or his wife, has a supply of. See that the premiums are enough to pay expenses, (which need not be heavy), and trust to sales, etc., for the "net proceeds."

AUBURNDALE, O., July 9, 1888.

Honey Exhibitions at Fairs.

The Bee-Keepers' Magazine, from which we copy the following excellent advice, says it was read before the Eastern N. Y. Bee-Keepers' Association, but by whom written the Magazine sayeth not.

Ought bee-keepers to make honey exhibitions at our county and state fairs? I think they had, and I believe that here is a field that has been too much neglected. The great point to be gained, is that whereby we can increase the home consumption of honey. The benefit that the great cause of apiculture would receive from a judicious exhibition of honey at our fairs is, that it gives us a chance to bring our honey in its different shapes, and ways of putting up, directly before a large number of consumers, with yourself behind the counter instead of the retailing grocer, who is often, I am sorry to say, not very friendly to our interests. It gives us a splendid chance to get right at the consumers, so to speak. We can disabuse their minds of the adulteration bugbear, and nail the "Wiley lie." How strange it is that this falsehood has secured such a hold on the minds of otherwise intelligent people. It seems impossible to convince a great many until you corner them right down with an offer of \$1,000 for proof and samples. I tell you, brother bee-keepers, if you get up a nice exhibition of honey and wax with some of the implements necessary in the business and an observatory hive or two of bees, it has been my experience, that you will not be without an audience; questions will generally be asked you as fast as you can answer them, and I know a great deal of good can be done.

It also gives us an opportunity to see and talk with the old-fogy bee-keepers, those who keep but a few "skeps" of bees in log gums and nondescript hives, to try and induce them to have their honey made in neat sections, and not lower prices by offering for sale their unmarketable honey. Of course harm to our pursuit might result from an exhibition by persons given to too much

bragging. Some conceited novice in the business might do injury by enlarging upon the number of tons of honey he thinks he can produce, and how soon he expects to become very wealthy, without giving as well the dark side of the business, when some severe winter he may lose from fifty to one hundred per cent. of his colonies, or the weather may be such during the time of the honey flow that every pound of honey he receives he finds has cost him two dollars or more per pound, as has happened in a great many cases this past year. Now just here I want to say that I think a great deal of harm has come to our business by this boasting, and reports of phenomenal large honey yields, it not only induces others who have no natural qualifications into the business to increase the competition, but causes the consumers to think they ought to buy cheaper. It may be urged that by these exhibitions we will induce many not now in the business to embark in it. I think not. I believe the better way is to come right out square and let them see what we are doing. I have made exhibitions at the Saratoga county fairs for a number of years and I have yet to hear of any one starting in the business as the result, but I know it has been the means of helping hundreds, I may say thousands, of pounds of honey out of the glutted city markets. I think, perhaps, you will agree with me that for the cause of apiculture exhibitions at fairs are desirable, but will it pay the persons making them for their time and the necessary expense? We might ask, does bee-keeping pay? Does any business pay? The answer depends in a great measure on the individuals themselves. It may not pay directly the first year, but if advertising is worth anything it no doubt will, in the long run. If your fair managers offer no premiums, make a good display one or two years without, and I think they will then, rather than lose this attractive feature. There is also a great advantage in being the first one to start in anything like this.

Feeding Back Extracted Honey.

After very kindly noticing our special number upon "Feeding Back" the Bee-Keepers' Guide says:

We are inclined to think that those who report favorably to this practice are a little mistaken as to the results from the amount of feed given. If the bees are gathering sufficient from the fields to keep them active, feeding might be profitable for the purpose of completing nearly finished sections, but when the dearth of honey is such that the bees from strong colonies, those containing from 50,000 to 60,000 bees, lay very quiet, scarcely flying at all, to feed under such circumstances would be disastrous in the extreme. It would arouse this great host of bees to the highest activity. They would wear themselves out with useless flying and a large quantity of feed would be wasted in keeping up this energy, while if let alone they will remain quiet, economize on their stores and save the wear and tear on their

wings, until the fall flowers bloom, when all nearly finished sections will be finished without any trouble or waste of feeding back. When we compare the trouble of feeding, the waste of honey, or the amount consumed by the bees, the waste of bees from their activity, the condition of the bees after the feeding and the general effect it has upon the whole apiary with the difference in price between extracted and comb honey, it does not seem as though any one should be in favor of feeding back. It seems to us that the more common practice of extracting the honey from the unfinished sections at the close of the fall honey season or storing them away to be put on again in the spring would be preferable.

Because we took up the topic of feeding back, and made it the subject of special discussion, we do not feel called upon to defend or champion the practice, our only desire is to arrive at the truth, but the idea advanced by friend Hill, and by others, that the feeding of bees arouses them to an abnormal activity that is injurious, is fallacious in the extreme. Feeding does arouse the bees, but not so much as a natural honey harvest, as it saves the wear and tear upon their wings; and it is in this direction that bees first wear out. When feed is first given to bees, if given in the day time, it starts them to flying, but after they have become accustomed to finding feed in the feeder it has no such effect. In fact, it has an opposite effect, if anything, and feeding has been objected to upon the ground that it kept the bees from the fields. Feeding starts the bees to rearing brood, and, if allowed sufficient comb in which to rear it, the colony will be more populous at the expiration of the feeding than when it was begun. Bees do not waste honey that is fed to them, it is either stored in the cells or used in brood rearing, and one reason why so many have failed to make a profit in feeding back is because of the superabundance of room given in the brood-nest. We carefully mark the hives containing the colonies used in feeding back; and these colonies are always found in an excellent condition at the beginning of the next season. It is possible that the plan of extracting the honey from unfinished sections, and storing them away for use the next spring, is preferable for the average bee-keeper, there is certainly much to be said in favor of the plan, but, if the bee-keeper will see that his queens are young, he need have no fears that feeding will injure his colonies, and more than he need expect such a result from a honey flow.

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We have a Lamb Knitter, nearly new, taken on a trade, that we offer for sale or exchange.

It will knit stockings, gloves, mittens, scarfs, wristlets, underwear, etc., in fact, almost anything that can be knit.

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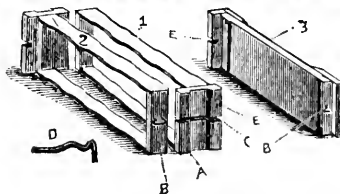
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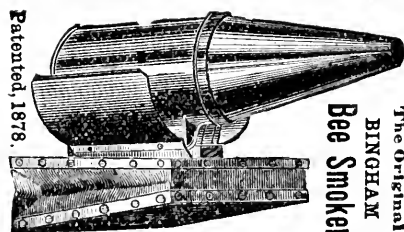
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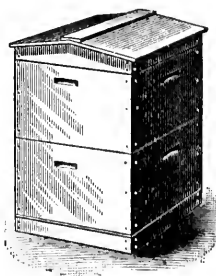
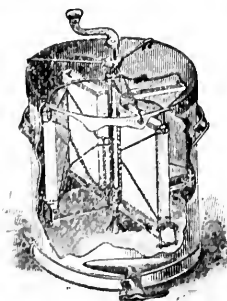
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THE BEE-KEEPERS' REVIEW

VOL. I. FLINT, MICHIGAN, OCTOBER 10, 1888. NO. 10.

Ventilation.—When Needed and Why.—The Best Means of Securing It.

DR. C. C. MILLER.

FRIEND HUTCHINSON.—If you'll enlarge the size of the REVIEW and give me all the space, it will give me a little better chance to tell part of what I don't know about ventilation. The days of hot discussion as to upper and lower ventilation of the hive are probably over. As nearly as I understand the matter from reading, those who practice out-door wintering generally favor the plan of, having the bees in some way warmly clad, so that no part of the walls of the hive shall condense upon it the moisture generated by the bees, trusting to the escape of anything objectionable through the entrance of the hive, or through the minute pores provided in the covering. But as to the ventilation of cellars, there is a great difference of opinion, from those who hold that no ventilation whatever is needed to those who believe in a constant inflow of fresh air. If ventilation of the hives is needed then surely ventilation of the cellar is needed. Of what use is it to change the air in the hives, if the air in the cellar be nowhere better than that in the hives? And if the air in the cellar be never so pure, with no chance for replacement, and if impurities from the hive are being constantly thrown into it, will it not be constantly becoming more and more foul?

I know there are those who say that bees use so little air in respiration that no pains need be taken to provide fresh air for them. I don't know how much they use, and most likely they use more at some times than others, but I suppose that where so much water is evaporated as to make several pounds difference in the weight of a hive in the course of the winter, that considerable respiration takes place, unless there be some means of evaporation independent of respiration. Undoubtedly temperature and the amount of activity make a decided difference in the amount of air used, as well as in the need of special means required for ventilation. The Siberian in his sledge, lies with his head completely buried in furs, and feels no discomfort, whereas the same condition would smother him under the tropics. The walls of a cellar may be so open, or the number of colonies therein so few, that plenty of air is provided when to all appearance the cellar is shut perfectly tight. When

the mercury marks 20 below zero, the great difference in the weight of the air in and out of the cellar causes pretty rapid ventilation no matter how tightly everything is closed, but let the temperature in and out be the same for any length of time and unless something is done, the ventilation will about cease. In the warm spells that come before time to take out the bees, they become very uneasy and noisy. At such times I open doors and windows wide and leave them open all night, and when I find the bees so quiet in the morning that the bright sun shining in upon them does not disturb them, it is pretty hard to convince me that, in that particular case, at least, ventilation was not a decided benefit.

In the face of all this, however, is the fact that others, such as G. M. Doolittle, succeed in getting along all right with none of the fuss and trouble I have, and their bees don't seem to need any ventilation. I envy them, and should be glad to be convinced that no ventilation is necessary for me. Possibly the time may come, when by attention to some details that now escape me, I shall be able to close my cellars up tight and leave them for the winter, but for the present I don't dare to attempt it.

With only a few colonies in a cellar I never made any provision for ventilation, plenty of air coming through the cracks of the wall. With an increase of colonies I provided for drawing off the air by means of a stove pipe, either coming down near the bottom of the cellar, or going from a stove in the cellar, the stove door being left wide open. I don't know that anything further is needed were it not for the fact that in very freezing weather all the fresh air that comes in is so cold that the cellar becomes too cold. For this reason sub-ventilation is needed, for if the air be carried one or two hundred feet at a depth of four or five feet below the surface of the ground before it enters the cellar, it will be raised to nearly the temperature of the ground at that depth. With 50 to 150 colonies in my cellar I am not sure but a four or six inch pipe will answer quite well for a sub-ventilator, and with a small pipe I think 100 feet is long enough. When the number increases to 200 or 300 colonies I prefer a larger pipe, and the difference in expense not being so very great, it may be best in all cases to have an eight or ten inch pipe. If the pipe should be larger than necessary it is an easy matter to close it up at

either end. With a ten inch pipe I think I should like not less than 200 feet in length, and a depth of not less than five feet. If the cellar be enough warmer than the outside air, there will be a constant stream of air coming through the sub-ventilator and passing out at the chimney above, and even if not needed this fresh air can hardly do any harm, for it certainly is a little more like wintering out doors in a mild winter, than if no such change of air took place.

Since writing the above I have again read the editor's article on page 137. It's good, and fair. I thoroughly agree that we know very little about ventilation, and further that what we think we do know, we may be mistaken about. For instance, Bro. H., you say that after you put in a sub-earth ventilator your bees wintered neither better nor worse. Now you don't know that. For you don't know how they would have wintered that winter without sub-earth ventilation. But if "the air in the cellar had a fresher, more wholesome smell," I would go to some trouble for that.

I agree about the space under the brood nest in the hive, and if I were beginning again I would perhaps have my hive bottoms detachable so that in the cellar there could be a space of two inches under the frames. It just occurs to me to say that all that is done about ventilating my hives in the cellar is to leave the entrance open full width, and on account of cellaring I have enlarged the height of the entrance from $\frac{3}{8}$ to $\frac{1}{2}$ an inch. The sheets on top are left sealed down just as they were on their summer stands, and on most of my hives will remain so from August or September till sometime the following spring.

You ask about size of cellar and number of colonies. I am very confident from my own experience that a very few hives will do better in the same cellar than a larger number, and as a general rule the smaller the cellar the more need of special effort to get a good supply of fresh air.

P. S.—I haven't time to fight back just now on the pollen business, but mind you the grudge holds good and I may take it up some time again. After all, what does it amount to practically, admitting that the pollen theory is correct? For even Brother Heddon does not now advise taking away natural stores and feeding sugar.

MARENGO, ILL.

Sept. 20, 1888.

Ventilation Dependent Upon Circumstances. —A Discussion of the Conditions Under Which it is Needed.

OLIVER FOSTER.

In considering this question we will notice first the direct effects of an interchange of air between the interior and exterior of the hive or bee cellar.

First, Under ordinary conditions it reduces the temperature.

This cooling effect of ventilation though beneficial in hot weather, becomes a source of danger in the winter. Then the fresh air from without provides the oxygen, which,

we are told, is essential to the life of every breathing thing. The accumulative poisonous impurities and excessive moisture which are constantly being thrown from the bodies of the living bees are wafted away with the air that passes out of the hive in the process of ventilation.

The amount of ventilation then that a colony of bees requires is determined by the quantity of oxygen they consume and also by the excessive heat, moisture and impurities they produce.

Now, if this consumption and production were always the same, the ventilation problem would be easily solved, but since the demand for air varies from one to a thousand, there is no wonder that we have various views concerning the question.

The two colonies that Prof. Cook sealed up with ice, perhaps, represented the minimum of ventilation required. I presume the air those bees received through the ice did not equal what would pass through an opening $\frac{1}{2}$ inch in diameter. In contrast with this, I had several colonies almost suffocated in my cellar last spring while we were carrying out the others. These had a three inch space below the frames with wire cloth at each end to the amount of seventy-two square inches;—1.52 times the estimated ventilation of Prof. Cook's colonies sealed in ice. In hot weather I have had bees smother with four times as much extra space and four times the ventilating surface. As a general rule the demand for air is in proportion to the consumption of food. Those conditions which effect the one control the other. Our object should be to reduce both to the minimum.

Although too much ventilation cannot be given at any time, provided the air is of the proper temperature when it enters the hive, the expense of warming the air justifies the strictest economy in its supply during cold weather.

With a properly constructed cellar we can control the temperature and adjust the supply of air to the demands of the bees. Where bees are packed on summer stands their apartments should be so arranged that the bees can regulate their own supply of ventilation according to their needs, which, we find, can be done approximately. I have made an extensive trial of six different arrangements for ventilation in connection with out-door packing, and have opinions as follows: The only ventilation should be provided for at the entrance, which may be at the top or near the bottom. A large antechamber should intervene between the apartment containing the bees and the outer entrance. If this chamber is above the bees it should also be above the packing. The passageway from the chamber to the bees should be eight or ten inches from the outer entrance and from one to one and one-half inches in diameter. If the chamber is below there should be openings to the bees on all sides and no packing between. This chamber serves as a reservoir in which the cold fresh air from without is tempered by the warm air from within, as it passes through in exchanging places.

The bees which often leave the cluster in cold weather, apparently for exploration, are warned of the weather before they have gone too far to return.

In very cold weather the passageways fill up with frost, which thus cuts off ventilation. When it moderates, the frost disappears, and when it gets warm in spring the bees cluster in the chamber around the opening.

Although I have had much better success with the chamber and entrance above the bees, I think after one year's trial that the proper place for the chamber is below.

Nearly all the methods tried have been eminently successful, yet I am not inclined to adopt any one of them just as followed.

Taking all into consideration I am inclined to think that a properly constructed cellar is a good enough place to winter bees in.

I have a cellar with a sub-earth ventilator 100 feet long and twenty-four inches square. It is walled with stone and is from four to eight feet below the surface. The cellar is 13x37. Along one side and one end a two inch brick wall extends from floor to ceiling and is four inches from the main wall. The space between these walls is used as a flue with a chimney arising from one end and a stove-pipe opening into the other. The stove is in a small ante-room into which the outside cellar way opens.

Five or six little fires during the winter fixes the temperature and drives out the moisture.

With upwards of 200 colonies in the cellar they often need all the ventilation the facilities will allow.

MT. VERNON, IOWA.

Oct. 3, 1888.

No Need of Ventilation, Unless it be to Control Temperature.

H. E. BOARDMAN.

FRIEND HUTCHINSON.—Your remarks in the opening of this subject in September REVIEW hit my mind exactly. As you say, we know very little on the subject, yet there are very few things in bee keeping where so much valuable time has been wasted as in devising successful means of ventilating bees to DEATH. What do we know about ventilating bees in the hives or in the winter repository? We do not even know what they require, and if we did know, it would then be by no means an easy problem to solve. It is a broad and important subject and much yet remains to be learned even in the ventilation of our own dwelling houses and public buildings.

Bees need air, but just how much depends upon their condition. At times they need a considerable amount, and at other times scarcely any is needed, depending very much upon the amount of activity in the colony. When bees are in a state of excitement, as is the case when swarming, or robbing, or when they are being moved, to close the hive entirely would prove fatal, while they might be closed in, if in a state of quietude, for days, or even weeks, without serious results.

At the approach of cold weather, when brood-rearing has been suspended, the bees lapse into a dormant state, in which condition they use but very little air, and so long as this condition of quietude can be maintained, I am fully satisfied that very little or no change of air is necessary for the welfare of the bees. But this condition does not continue throughout the winter. As spring approaches brood-rearing is again resumed, which is attended by an increased activity of the bees and a rise in the temperature. This condition calls for an increase in the supply of air. This supply should, I think, be only sufficient for the actual needs of the bees, and not excessive or in drafts, which will disturb the bees and do harm. The amount of air in a bee room at this season will depend upon the size of the room, the number of colonies it contains, something upon their strength and very much upon the general temperature and weather outside. It is a mistake that bees wintered in doors do not feel the changes of weather, even though the thermometer inside does not.

The capacity of a winter repository can only be determined by experience. It will vary in different seasons. It is desirable to put in as many as will go through the spring without heating up or giving trouble in controlling the temperature. I sometimes give free ventilation at night, or when it is cool outside, to lower the temperature if it gets too high. I don't just like to do it, but consider it better than letting the bees get too warm.

When I built my first bee-house, some years ago, I had some quite positive notions about ventilation, and I had the bee rooms arranged with ventilating tube to give ample ventilation—a constant supply of fresh air. Later experience has proven them to be worse than useless, and I have abandoned them altogether as well as all other special means of ventilating my wintering repositories, and at the same time I provide ample means for the ventilation of the hives in the natural way; that is, by leaving the entire bottom of the hive open—never disturbing the top or cover as is the custom of so many bee keepers, especially in out-door wintering.

The frequent reports of bees going through a long winter buried in the ground, entirely excluded from the air, and coming out all right in the spring, is, I think, the most practical proof that they do not really need much ventilation in winter in repositories.

I think I would not hesitate to pack a moderate sized room full to its utmost capacity and close it until February, provided the bees could be left in a state of quietude, and a uniform, favorable temperature maintained. Temperature and ventilation are so closely connected that it is quite difficult to separate them into two distinct topics.

I have only considered this topic in its relation to indoor wintering. In wintering on the summer stands there are no doubt many things to be learned, many mistakes to discover, many methods to improve, but there is room in this direction for an entire article.

EAST TOWNSEND, OHIO,

Sept. 26, 1888.

Suspended Animation.—Little Need of Ventilation.

J. H. MARTIN.

There was much in our bee journals a year or two ago about the Daniel McFadden method of wintering bees in high latitudes. It seemed to be a case of suspended animation. If we advance a little further toward the pole we find that the Dog Rib Indians living near the Great Bear Lake annually consign a greater portion of their tribe to the bottom of the Lake in hermetically sealed cases where they remain with animation suspended for several months, and upon the approach of warm weather they are fished out and restored by the animate portion of the tribe. In corroboration of the above there are Hindoo jugglers who will allow themselves to be buried several days with seemingly no injury; and now Dr. Tanner, of fasting fame, proposes to be sealed up for three days, and then to be restored.

If the human species can thus live without ventilation, it is high time that bee-keepers should try some experiments with their bees in our lower latitudes. It would certainly be an economical method for both bees and bee-keepers to get through the winter with suspended animation. In fact, they will be obliged to if we have many more seasons like the past.

Leaving the theoretical, or perhaps the fanciful, I am led to review my experience in ventilation, during the wintering of bees. My views have materially changed during the past few years, and I do not pay so much attention to the change of air as formerly. My bee cellar is provided with a sub-earth ventilator, but I have discontinued its use. I also have ventilators opening into an ante-room. These I now keep closed. The ventilators from the bottom of the cellar up through the roof are of more importance. A gradual draft draws off foul air, and there is no cellar made so tight but it will allow enough fresh air to enter around doors, windows, etc. A strong draft with open ventilators for the ingress of air, changes the air too rapidly and causes uneasiness in the bee hive, while a slow draft and moderate circulation is the most conducive to an equal temperature and quietness.

I have thus a definite plan for the ventilation of the cellar. I have also a definite plan for the ventilation of the hive. In the past I have had indifferent success with quilts and porous absorbents. I now use, with better success, a broad cover which is securely sealed by the bees. The hive is also placed upon a two and one-half inch rim. Besides the entrance in front, there is a slot on each side one inch wide and twelve inches in length. This is covered on the inside with wire cloth. With this ventilating rim I have had good success in wintering.

When wintering out doors I also use this rim, but cover the side ventilators with the packing. The ventilation question I think is but little understood. We have been too busy in disposing of our sweets at a time

when we should be studying and experimenting upon this subject. I propose to seal up a hive as tight as possible with newspapers, and report in the spring. My bees will soon be ready for the cellar, and, as I have but little honey to dispose of, I shall be ready to start for the Great Bear Lake about Nov. 1st. A kind invitation is extended to other bee-keepers in a like forlorn condition.

HARTFORD, N. Y.,

Oct. 1, 1888.

Upon receipt of the above we wrote friend Martin, asking him if that Indian story wasn't a pretty tough one? If he could substantiate it if called upon for proof; or did he intend it merely as a fanciful legend? Here is his reply:

HARTFORD, N. Y., Oct. 10, 1888.

FRIEND H.—Your postal received. I had to smile upon reading it. Well, that is a pretty big yarn; but, in my estimation, it isn't much bigger than that McFadden story. I read the Indian story some years ago in some travels. I have forgotten who the traveler was. I think it was Sir John Richardson. And it has been recalled several times when reading some impossible scheme of bottling bees for six months or so. So the only thing I can substantiate is that it was related by a traveler. Mackenzie, the first European who became acquainted with them, describes them as an ugly, emaciated race, besmeared with grease from head to foot. So I will say in the words of Hamlet: "There are more things in heaven and earth, Horatio, than are dreamt of in your philosophy."

The story also has an application to those who are blue and wish to pass the winter economically. If you wish a postscript to my article use the above quotation from Hamlet, or any explanation you choose.

Respectfully, &c.,
J. H. MARTIN.

Ventilation Apparently a Damage.

J. M. DOUDNA.

FRIEND HUTCHINSON.—After reading the REVIEW for January I feel like saying it is "just the ticket" and you will make it win.

There is one subject I should like to see discussed, and that is "ventilation." It perplexes me more than all other winter problems. My cellar is 12x14 feet and 9½ feet deep. In the south-west corner a six inch pipe connects with the chimney above and reaches to within one foot of the cellar bottom—at least this was the arrangement in 1886-87; the present winter the pipe extends only one foot below the upper floor, but the results are the same. There is a sub-earth pipe, or square box, 4x6 inches in the clear, 125 feet long, and seven feet under ground. It enters the cellar at the north end. This has been kept closed most of this winter, but was open all of last winter, when the frost got in badly, and I had many mouldy combs. The temperature this winter has not been below 42° and there is no sign of mould.

The cellar is very dry : five feet at the bottom being dug in sand.

The hives are in three rows, the middle one being double. In the alley on the west side there are ten times as many dead bees as in the one on the east side, and the nearer the ventilator the more dead bees.

The winter entrance to the cellar is by a trap door in the floor of the kitchen at the north-east corner, opposite the ventilator: and if any bees are disturbed by going into the cellar, it is those nearest the trap door which is often left open an hour at a time with the light shining on the hives: yet the bees seem to be hibernating perfectly. I do not think there is a quart of dead bees in this corner, while in the opposite one with the same number of hives, there is a bushel. Now if the "fathers" in bee-keeping did not tell us to ventilate the cellars I should say ventilation was a fraud.

The hives are piled one on another six high, and the cellar is so full as to leave very little room to move around.

I am satisfied the outlet pipe is a disadvantage to the bees near it. Is it any benefit to those further away? We cannot have outside ventilation above ground and keep the cellar from freezing in this climate, as the mercury is often "monkeying around" 40°—. It has been frozen solid several times this winter, while the spirit thermometers have shown as low as 54°—zero.

I think of trying one winter with all ventilators closed, but am afraid it will not be satisfactory.

Now will some one tell me how to winter a cellar full of bees and have all sides winter alike? There seems no difference between those at the top or bottom of the piles. Up to this time none show a spot of diarrhoea on the hives this winter, although they have every winter when the temperature was allowed to get below 32°.

ALEXANDRIA, MINN.,

Feb. 1, 1888.

Ventilation Needed Only to Control Temperature.

PROF. A. J. COOK.

Nature is too abstruse and her ways and methods too involved and intricate for any of us to be dogmatic in our opinions. I think science, and also bee keeping, (for the earnest student of bees is a scientist, whether he ever went to school or not), tends always to make its votaries modest in their assertions. So I do not speak ex cathedra on this matter of ventilation. I will simply express my views tentatively, premising that I am a learner in this and all other subjects pertaining to our art.

Bees, I think, need very little air. Especially so in winter when they are taking so little exercise. Direct experience proves this. Thus, while I should prefer to have a sweet, wholesome atmosphere in my cellar always, possibly because it is such a pleasant thing to think of when I wake up in the long winter nights and think of the bees snug in their winter quarters, yet I doubt if the matter of ventilation as ventilation need give us serious thought.

Why did I arrange for sub-earth ventilation in our new bee cellar? you ask. Well, because our old one had it and was a grand success, and I know of many such cases. Mr. Jones has sub-earth ventilation in his bee houses, and, of his years of experience, unless he has changed of late, believes in it. Now our theory! Well, I believe in this simply to control temperature. I believe if correctly arranged we can control the temperature to our liking with such an arrangement. I think this is Mr. Jones' view. Were I sure I could keep the temperature in my cellar from 40° F. to 45° F. easily and cheaply, despite the outside blasts, I would never go to the expense of such ventilation. To be sure I did not succeed last winter even with it; but for my life I can't see why. My brother and many others whom I know winter satisfactorily with no such ventilation. Yet their cellars keep at just about 45° F.

I believe in short that we may dismiss the idea of carbon dioxide and oxygen, so far as cellar ventilation is concerned: but the heat and temperature problem we must never lose sight of.

AGRICULTURAL COLLEGE, MICH. Sept. 18, '88.

Ventilation wholly Unnecessary.

JAMES HEDDON.

You ask me to tell you what I know about the subject of ventilation for bees. I suppose, of course, you mean as it has a bearing upon the successful wintering of the insects.

As you know, I have been a heavy loser of bees in years past, they having succumbed to the same old malady which sweeps them out of existence for others who live in this latitude, viz., bee dysentery.

You know how many theories have arisen from time to time, as to the cause of these winter losses. Well, at one time, all eyes were turned toward ventilation as the one great condition that was to solve the whole problem. Reports came in from all sorts of ventilation, that of the hives and the repositories, until it became evident to the thinking man, especially if he were himself an experimenter, that ventilation had nothing to do with the wintering problem.

A few years ago, when I was building my large cellar, I wrote to several leading beekeepers who, I thought, knew most about the winter ventilation of bee repositories and hives. After I had heard from all of them, and re-considered my own experience, I made up my mind to lay no sub-earth pipes, and to make no special arrangements for ventilation; and since I have wintered bees in the cellar, ever experimenting, I believe I concluded wisely.

In a repository containing a large number of colonies in proportion to its size, I reason that a little change of air is needed, but I am quite sure that most beekeepers over estimate the importance of ventilation. I should not be at all surprised if it should prove to be a fact that, when all else is right and bees are in that quiescent state which accompa-

nies successful wintering, they need no change of air from the time the hives are set in until they are taken out of the repository.

DOWAGIAC, MICH..

Sep. 28, 1888.

Old Bees and Queens—Late Feeding of Sugar—Heavy Losses the Consequence.

C. E. BOYER.

The fall of 1887 found me with 118 colonies. About thirty of them were weak second swarms and nuclei. These were united, and by September 12 there were only 103 colonies. All were now weighed, and sixty colonies, forty-five of which were prime swarms having old queens, were found to be in almost a starving condition. Those with old queens had slackened breeding the latter part of July, hence they were rather weak, having mostly old bees. A few of the sixty colonies had five to eight pounds of honey, but nearly all had only from one-half to two pounds. I immediately began feeding these colonies sugar syrup, prepared as follows: Thirty-five pounds of water was placed in a galvanized iron pan and brought to the boiling point. 100 pounds of granulated sugar was then stirred in, and, as soon as the sugar was well melted, ten pounds of honey was added. As soon as the boiling point was again reached, ten level teaspoonfuls of tartaric acid, dissolved in a cup of hot water, was stirred in, and the syrup allowed to boil three minutes longer.

This syrup was put into large feeders, on top of the hives, about ten pounds given each colony at one time, and the feeding continued until each colony had twenty pounds of stores. The weather was quite cool, and having only a few feeders, it was October 20 before the work was completed.

The syrup was very thick, and the bees would take it only when it was given to them warmed and a little at a time. As the weather grew colder, the syrup hardened in the feeders and the bees could not remove it.

November 24, only forty-seven of the sixty colonies remained alive; these were put into the cellar, and by March 1 not one colony was alive. The syrup had crystalized in the combs. A few showed signs of dysentery. Some colonies died clustering on combs of crystalized syrup, and a few had left the hives entirely.

Of the other forty-three colonies, all except six had vigorous young queens, with plenty of young bees and brood, and, with the exception of ten colonies, were supposed to have plenty of honey. The ten colonies that were lacking in stores were fed about five pounds each of syrup.

The six colonies having old queens were put in the cellar November 24, and taken out March 15. One was dead from dysentery; two were weak and scant of honey and one of them soon died; three had wintered fairly well.

The thirty-seven colonies with young queens and mostly natural stores were put in the cellar November 19. Thirty-one wintered well; four were short of honey and weak in numbers; two starved.

The bees were all wintered in the same cellar. It had an earth floor, and upon this was spread sawdust to the depth of about three inches. This was intended to absorb the moisture, and so it did, it became wet, and the heat, causing evaporation, kept the air damp all winter.

When the bees were put in, the temperature was 45° to 48° and remained there about forty days, when it lowered to 40° to 42°. The outside limits of temperature were from 38° to 50°; and it went to either extreme only three or four times and remained but a short time.

I suppose there are several causes for the sugar-fed bees dying, but I think the main one that of improper food given too late in the season. I do not mean that sugar syrup is an improper food, but the feeding of it so thick, using acid, so late in the season, is, I believe, the cause of my losses.

AINGER, OHIO,

Sep. 25, 1888.

Fall Honey That Always Kills the Bees.

BYRON WALKER.

The following from friend Walker came to hand a little too late for the Sep. No. It seems that our friend secures magnificent crops of fall honey, but it is very unwholesome as a winter food for bees. He solves the problem, however, by going South in the spring and bringing home a car load of bees. Ere another spring we hope to have him tell the readers of the REVIEW all about how he manages this part of the business.

FRIEND HUTCHINSON —: Your letter asking for my views in regard to "Food and its relation to the wintering of bees" was duly received and ought to have been answered before but was not, partly because I have been so very busy and partly because I hardly knew what answer to make. As I have some 280 colonies of bees scattered in five different localities, that I am trying to manage with the help of a couple of boys, and, as honey—mostly comb—has been coming in at the rate of 500 pounds or more per day, for several weeks, you will see that I can't spare much time to write articles.

If success attained in wintering bees during many successive winters is a condition required of those who write for the instruction of others on any of the various problems entering into this subject, then I am to be counted out. On the other hand, if a record of comparative failure in wintering during such a period (I have averaged a loss of over fifty per cent, or, at least 100 colonies, each winter—several years twice that number—for fourteen years, while those that did survive the winter and spring were usually in a very weak condition) if continued failure, year after year, can qualify a man in any manner to write upon this subject, then, undoubtedly, I am the man. Be that as it may, I cannot now spare the time for that purpose, but, without going into details, I will endeavor to give you the conclusions I have reached in this matter of food for bees in winter.

Before doing this it may be well to state that my apiaries are located in the vicinity of immense swamps that cover a great part of four townships. They abound in an abundance of fall pasturage, such as asters, bone-set, etc.; and that the losses above mentioned were incurred in spite of the utmost care in providing winter protection. Chaff hives, every description of packing, bee-houses and cellars constructed expressly for the purpose, with sub-earth ventilation and without, having all received a thorough trial.

My first conclusion is that honey gathered from swamp flowers, with the exception of that from golden rod and it may be a few other flowers, is greatly inferior as a winter food for bees compared to that gathered from linden or clover.

Second, that honey gathered from swamp flowers is sure to result in bee diarrhoea where long confinement of the bees to their hives is caused by cold weather, and this will be the case no matter what protection is given, in doors or out.

Third, that the honey gathered from the source mentioned is in no respect better as a winter food when gathered during an abundant flow.

Fourth, that otherwise poor honey for wintering cannot be made good by thorough ripening. Some of the worst cases of bee diarrhoea that I ever saw resulted from honey gathered in the South the previous spring and so thick it could hardly be extracted.

Fifth, where hard frosts do not come until late, and the honey harvest lasts well into September, it is not practicable in large apiaries, at least, to replace poor stores by extracting and feeding.

Sixth, where the stores are partly early and partly late gathered it is better to risk it with such stores than to attempt a change after frosty weather appears.

Seventh, no matter what the stores, a temperature of 50° is too high for good results.

Eighth, although not altogether germane to this subject, where the last of September finds the hives filled with stores unsuitable for winter use, it will be more profitable to destroy the bees and extract the honey than to run the risk of wintering the bees. If they could be furnished with sealed combs of sugar syrup or early gathered honey it would be all right. If the bees were destroyed I should expect to ship bees from the South in the spring to cover the combs.

I hope you will have an article on this subject from Mr. Bingham, as I see that he has found it practical to change these late gathered stores for something more suitable; but he has not yet given us the particulars. See A. B. J. for Feb. 22, page 117.

CAPAO, MICH., Sep. 8, 1888.

Special Ventilation not Needed.

R. L. TAYLOR.

I reason that the matter of ventilation is not of very great importance, because after trying different plans and many different degrees as regards the amount of air admitted I have not been able to see that the manner

in which the bees were wintering was affected thereby; at least so far as the final result was concerned. As a consequence, I now place but little importance upon the matter and pay little regard to it except in so far as it may be utilized to aid in expelling moisture from the hive and in controlling the temperature.

In cellar wintering I find the most satisfaction in ventilating the hive by entirely removing the bottom board and setting the hive on two strips of board. The bottom of the hive being thus left entirely open allows all debris and dead bees to drop out and all moisture to be the more readily expelled.

For some reason which I am unable to fully explain I have occasionally found my bees in the cellar greatly aroused. At such times and when they become uneasy towards spring the opening of an outside window for an hour or more has a very quieting effect. Then, sometimes, as the time for new pollen approaches and the temperature of the cellar goes threateningly high the opening of a door or window for the night makes everything cool and quiet again.

The points that I have mentioned cover the ground of ventilation so far as I have been able to make a practical use of it.

LAPEER, MICH.,

Sep. 29, 1888.

Loss of Bees by the Crystalization of Sugar Stores.

H. D. BURRELL.

I often see sugar referred to in the bee papers as a safe winter food for bees; that it is not invariably so is shown by the following bit of experience.

In September, 1885, I fed two barrels of the best grade of granulated sugar to about sixty colonies; feeding from five to twenty pounds to the colony, as needed. The syrup was made with sugar, tartaric acid and boiling water, according to a formula especially recommended by one of the most experienced advocates of sugar for winter stores; yet it crystalized in the combs as hard as maple sugar, and every colony having stores consisting largely of this food either died or wintered so poorly as to be practically worthless. At the same time about eighty colonies in the same yard but having all natural stores wintered with the loss of only two colonies, and they were smothered by the entrances becoming closed with chaff. All were chaff-packed and wintered on their summer stands.

I have fed sugar largely many times and usually had trouble from crystalization. Last fall a friend fed sugar syrup in which was mixed twenty per cent of honey and the usual amount of acid, still some of it hardened and killed the bees.

Nearly every year for many years I have wintered more or less colonies on stores consisting largely of sugar, and my experience leads me to prefer the average run of honey to sugar, every time.

BANGOR, MICH.,

August 30, 1888.

The + Bee-Keepers' + Review, PUBLISHED MONTHLY.

W. Z. HUTCHINSON, Editor & Proprietor.

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FLINT, MICHIGAN, OCTOBER 10, 1888.

QUEENS INJURED BY ENFORCED IDLENESS.

Mr. Doolittle asserts, in a well written article in *Gleanings*, that queens are not injured so much by transportation in the mails, or by express, as they are by the sudden check in egg production, that results from taking them away from full colonies in which each queen is laying perhaps her weight of eggs each day. We think he is correct. We have always noticed that a young queen, just beginning to lay, is far less likely to be injured in shipment than one laying extensively in a full colony.

A PRIMITIVE HONEY EXTRACTOR.

Mr. Lemuel Stout, of Philadelphia, Pa., has succeeded in extracting about forty lbs. of honey, all he had, by placing the combs in a tin can attached to the rim of an old buggy wheel, said wheel being held in a horizontal position by an old hoe handle thrust through the hole in the hub. The lower end of the hoe handle rested in a small hole made in a block of wood fastened to the floor, while the upper end revolved in a hole bored through a block fastened to a joist overhead. A cord was wound around the hub, and, by pulling strongly on the cord, the wheel was made to revolve.

UNSTITCHED AND UNTRIMMED MAGAZINES.

There is not a foreign bee journal that comes to our desk trimmed, and some of them are unstitched. The last number of the *Advance* also came untrimmed. Yes, and there are two leaves in nearly every number of the *C. B. J.* that, for some reason, are uncut. To some this may seem like a small matter for criticism, but, to the busy or tired man, who must hunt up needle and thread and stitch a paper (and he can't do it so neatly as it is done by a professional), then hunt up the shears and haggie off the

edges, or use his pocket knife and leave the edges of the leaves looking like the cutting edge of a fine-tooth saw, to such a man this condition of affairs sometimes assumes sufficient magnitude to induce him to toss the magazine into the drawer unread. The leaving of magazines unstitched and untrimmed is a nuisance for which there is no excuse.

PAPER HONEY CANS.

Mr. Will Heddon, son of James Heddon, has been experimenting with stout manilla paper as a substitute for tin in making the jacketed cans for honey. In an article to *Gleanings* he tells how they can be made—glued together over a block—at a cost of five cents for materials. We have often thought of paper as a material for this purpose but supposed it would be of no use, that the honey would soak through. After receiving Mr. Heddon's letter, Mr. Root did some experimenting in this line; but, if we understand him aright, he used water instead of honey when testing his work. The water soaked through. He then coated the inside of the package with wax, by pouring in melted wax and turning the package over and over, and it held water for several days even when subjected to rough treatment. It finally sprang a leak. It strikes us, however, that honey is the stuff with which to do the testing. We sincerely hope that this idea may yet be worked out to a practical success.

EXTRACTING HONEY WITH THE EDGES OF THE COMBS TURNED TOWARDS THE CENTER OF THE EXTRACTOR.

The *British Bee Journal* has been describing a honey extractor in which the combs are placed in a horizontal position; and the folks that publish *Gleanings* have been experimenting by placing the combs in a perpendicular position, but with their edges pointing directly towards the shaft of the reel and towards the outside of the extractor. That is, they occupy positions similar to the spokes of a wheel. It will be seen that a large number of combs can be placed in one extractor, and there will be no necessity of reversing them. At first thought it would seem that the combs could not be emptied when in this position, but actual practice says that nearly all of the honey can be thrown out even when it is quite thick.

When at the North American convention we had a talk with Ernest Root about their experiments in this line, and he says there is not a particle of doubt but that new honey can be thus extracted. Let those who fail to "catch on" hold a glass of water at arm's length and rapidly swing it around. The manner in which the water flies over the side of the glass will illustrate how the honey can get out of the cells when whirled in this manner.

It will, of course, require time and more experiments to determine how much of practical value there is in this idea.

CARNIOLANS—ARE THEY A VARIATION OF THE GERMAN BEE?

In the October number of the *Apiculturist*, Mr. L. Stachelhausen tells us that the Carniolans are certainly nothing but a variation of the so-called German bee; and Prof. Cook gave utterance, at Columbus, to the same assertion. Mr. Stachelhausen says the Carniolans are very good for their location and for certain purposes, but not for American apiaries. Prof. Cook is crossing them with the Syrians and is pleased with the results. The Carniolans are certainly yet on trial in this country. Let us avoid premature conclusions. One thing is certain, there is no cause for mourning if they are a variation of the black bee; the practical question is, do we want them?

THE ARTIFICIAL COMB ONCE MORE.

A few days ago we received from Mr. Weed a $4\frac{1}{4} \times 4\frac{1}{4}$ section full of artificial comb. That is, it was full of comb walls, but there was no septum. It was exactly like what would result from cutting off one side of a very thick comb, cutting close to the septum. Accompanying the specimen came the following letter:

DETROIT, Oct. 6, 1888.

MR. W. Z. HUTCHINSON:—

DEAR SIR.—I mail you to-day an incomplete section of comb, which shows that it can be made of the size to fill a section box. The plate which was in process of making when you were here, is at last finished, as the comb shows. The machine for putting on the base, and putting the halves together, is in process of making, and will soon be done. The piece sent was cut off of another about fourteen inches long. We expect to commence making the wood base right away.

Yours, &c.,

238 Third St.

E. B. WEED.

APICULTURE AT THE MICH. EXPERIMENTAL STATION.

We are pleased to learn that some of the money appropriated by the Hatch bill for the establishing of experimental stations, is to be expended under the supervision of Prof. Cook in making apicultural experiments.

First upon the list of experiments to be conducted is that of crossing different varieties of bees. Making "hybrids?" Yes, but don't sneer gentlemen; some of our most valuable plants, animals and fowls originated in a cross.

Next upon the list is that of special planting for honey. Among other things a large quantity of Rocky mountain honey plant seed is to be sown this fall. This plant fairly revels in a drouth. Pleurisy root is to be given a trial; also the Chapman honey plant. As the Professor says that but little cultivation is to be done, that it can't be afforded, that the plant to be of value must be of the "root hog or die" order, those that can spread and take care of themselves, we don't know as we have any "bone to pick" with him on the subject.

Next in line comes the experiments in regard to the adulteration of honey, and its detection.

Other lines of experiments will be taken up; and those who know Prof. Cook know that the truth will be told, and that good will come.

VENTILATION.

According to the views of the majority, as expressed in this number of the *REVIEW*, no special arrangement is needed for the ventilation of a bee repository. And let us not forget that the views herein expressed are those of our leading bee-keepers, those who stand at the head of their profession and know whereof they speak. We are proud of the articles in this issue; not only are we proud, but we are pleased to see how nearly their authors agree. Ventilation, simply for the sake of securing fresher or purer air, finds but little support; while the few who plead for special ventilation do so almost entirely upon the ground that they can thereby more readily control the temperature. Some who have been to the expense of furnishing their cellars with sub-earth and special ventilation have finally abandoned it as not only useless but injurious. If bee repositories are

built sufficiently under ground it does not seem that ventilation would be very much needed for controlling temperature. When bees settle down into that quiescent state that accompanies successful wintering, at least during the fore part of the winter, their need of air is very slight indeed. When their nap is ended, and spring arouses them to activity and to brood rearing, more air is needed. It is then, if ever, that special ventilation is a benefit; but as all that is needed can be so easily secured by the occasional opening of doors or windows at night, if it ever becomes really necessary, it hardly seems worth while to go to the expense of laying sub-earth pipes. We should not, nor advise it. There is one thing, however, that becomes clearer each year, and this discussion upon ventilation has added to its transparency, and that is, that there is an advantage to be derived from raising the hive from the bottom board. Perhaps this ought not to be called ventilation, but it is certainly very beneficial.

NO CHANGE OF POSITION.

In the Aug. 22 A. B. J. Bro. Newman very kindly copies our editorial upon "Sweet and Alsike Clover" that appeared in the August REVIEW, prefacing it, however, with the following:

Alsike and Sweet Clover.—Mr. W. Z. Hutchinson, editor of Bee-Keepers' REVIEW, some time since took strong grounds against planting for honey. At that time we concluded not to say anything about it, because we felt sure he was mistaken, and that time would soon demonstrate the falsity of his position. It has now come. In the last issue of the REVIEW we find the following which shows that had it not been for sweet clover, many honey crops already gathered would never have existed. The crop of honey yet to be gathered seems to promise exceedingly good results. Tally another one for sweet clover.

We fail to see anything in our editorial demonstrating the falsity of our position, or indicating a change of views upon our part. To be sure the reports we gave went to show the value of sweet and Alsike clover as honey plants, but we have never contended that they were not valuable. Our position has been and still is, that the cultivation of plants for honey alone is unprofitable; that the introduction of sweet clover into waste places, when the area of waste land is sufficiently great, is very desirable; that the cultivation of Alsike clover and buck-

wheat, in sufficient quantities, near an apiary, is advantageous to the owner of the apiary; that in adopting the cultivation of honey bearing crops the expectation of securing honey should not be given too much weight. We have recently visited Dr. Mason and seen the bees coming in loaded with nectar from the sweet clover, and heard that welcome roar at eventide made by the bees in evaporating their honey; but the planting of the sweet clover cost Dr. Mason not one penny.

The above was put in type for the Sep. REVIEW, but was finally crowded out.

WHY THE REVIEW IS LATE.—ATTENDING CONVENTIONS.

We do delight in seeing a periodical out promptly, on time; and when we "caught up" last spring, after our illness, we most thoroughly resolved that, in the future, the REVIEW should be on time. In fact, we got out the September number a little ahead of time, to allow us to attend the State Fair. Just as we were preparing to go we were attacked with inflammatory rheumatism. For two weeks we were confined to the bed, suffering intensely; then we began to sit up, and, finally, to hobble about. At last we were able to set a little type by placing the case low down in the rack, and sitting in a chair. We had up nearly a "galley" of type, and would probably have had out this number on time, had it not been for the doctor. He came in one morning, and we were telling him how much we wished to go to the convention at Columbus, when he surprised us by saying: "Go! I don't think it will hurt you a bit. The change and the excitement will do you good, and you will come back feeling better." We picked up and went, and had a good time. Of course we did not meet a large number, did not expect to: the three past seasons have been too poor to allow of large crowds at a convention. Nothing particularly new was brought out in the discussions. In fact, to one who reads the journals and keeps posted, there is but little to be learned in the discussions at a convention. Were it not for the social part, many conventions would not be worth the attending. But to meet our brother beekeepers, to grasp their hands, to look in their faces, to rub our mind against theirs in actual, personal conversation, is a great thing. It brightens us, it sharpens us, it

gets us out of the ruts, and we go home with a feeling of vim and freshness about us. We have always noticed that when the editor of a journal attended a convention the next number of his paper was greatly improved. There would be a freshness and sparkle, indescribable, but nevertheless very apparent.

SUGAR FOR WINTER STORES.

Dr. C. C. Miller, in a recent number of *Gleanings*, very fairly sums up the question in regard to the policy of using sugar for winter stores. When this can be done at a good round profit, he thinks it unreasonable to expect a bee-keeper to refrain from its use; on the other hand, he admits that its use is no benefit to the money market, and, unless the gain is considerable, he would advise wintering the bees upon their natural stores. It has been argued that it is all right to use sugar when there has been a failure in the honey crop, but that the substituting of sugar for honey is highly improper. The Doctor can see no material difference in the cases, and we must say that we agree with him.

Mr. Doolittle, in this same number of *Gleanings*, gives directions for preparing sugar syrup for winter stores; and Mr. Root, in his comments, says he cannot believe it necessary to add anything to the syrup to prevent crystalization. We think Mr. Root in an error upon this point. It is true that he has fed sugar without the addition of anything to prevent crystalization, and it remained liquid in the combs. We have done the same thing, but the sugar was given early, and in handling it the bees probably added sufficient acid to prevent crystalization. The feeders and utensils were badly coated, however, with a crust of sugar. When we have added acid or honey all crystalization has been prevented even in the utensils. Like Mr. Root, we have never had any syrup harden in the combs, but the correspondence in this issue of the *REVIEW* shows that others have, even when all precautions have been heeded.

Late in September we received a letter asking if we would advise the extracting of honey in October and the feeding of sugar. We replied that we would not unless there were most excellent reasons for believing the honey unsuitable as a winter food. Extracting honey at this season of the year is very unpleasant business. The weather is cold, the honey thick and stiff and difficult to

extract, the bees "dumpish," but cross when aroused; and we think this late disturbance far from beneficial. The decision to use sugar for winter stores should be arrived at early in the season, and the management be such that autumn will find the brood nests nearly free from honey, then it will only be necessary to put on the feeders and feed. If the locality is such that there is a fall flow of honey, then the sugar must be fed during any dearth of honey that may occur earlier in the season, and a set of combs filled with sugar syrup thus secured for each colony. As the final honey harvest draws to a close, the combs of syrup can be exchanged for the combs of honey.

Much has been said about honey and pollen being the natural food for bees, and it has been argued that no trouble could arise from that source. Did bees never perish when left entirely to nature's management, this argument would be more forcible; but when, undisturbed by man's reason, they meet an untimely fate, it is evident that nature has made a mistake somewhere.

MOISTURE.

Some of the topics taken up for discussion are necessarily of more importance than others. A most thorough discussion of some of them only shows us that they don't amount to anything. Well there is considerable consolation in that. Its a comfort to know that there is no necessity, unless it be in exceptional cases, for special ventilation of bee cellars. Next month we are going to discuss a topic that may not be of very much importance, and then, again, perhaps it is, and it is to aid us in arriving at a decision that we shall discuss it. The subject is moisture. Is it an advantage to have the air of our bee cellars dry? Or, do the bees winter more perfectly in a moist atmosphere? Or, is this an unimportant factor? If it is important how shall we determine what degree of moisture is most conducive to the health of the bees, and, having decided this point, what shall we do about it? How can we control the amount of moisture in the air in our bee repositories?

It seems to be almost universally admitted that dryness is desirable, yet there seems to be a woful lack of facts upon which to found this belief. That the air must be dry seems to be the natural conclusion at which we would arrive, and, having thus decided,

efforts are put forth to secure the desired condition. The bees winter well, perhaps, and the conclusion is jumped at that a dry atmosphere is very essential. What proof is there that the bees would not have wintered equally well in a damp atmosphere? We know there are strong advocates for dryness in bee cellars; but bees have been wintered exceedingly well in damp cellars. Several years ago a Mr. Simpson, of Illinois, dug an out-door cellar. He was hindered in finishing it until late in the fall. He then put poles across and covered it with straw. The straw was some distance from home, and it snowed between the loads; thus the covering was of alternate layers of straw and snow. The heat from the bees gradually melted the snow, and there was a constant drip, drip, drip, all winter. The water stood in puddles upon the hives and at the entrances, while the cellar bottom was a perfect mud hole. Contrary to the owner's expectation, the bees wintered well, better than bees in other dry cellars in the vicinity. It must not be forgotten, however, that water in a cellar does not necessarily cause moisture in the air. It all depends upon the relative temperature of the air and water. If the water is warmer than the air there will be evaporation, if colder, there will be condensation, and the air will be actually dryer for the presence of the cold water. A lump of ice will dry the air in exactly the same manner, viz., by condensing the moisture. Perhaps the most practical method of drying the air in a cellar would be by the use of charcoal or lime, which are great absorbents of moisture.

The way to decide in regard to the amount of moisture in the air, is by the use of a wet bulb thermometer. The arrangement is very simple, and any of our readers could make one. Attach two ordinary thermometers side by side to a piece of board. Just below them fasten a tin cup for holding water. Make a light covering of candle wicking for one of the bulbs, allowing the wicking to extend down into the water in the cup. The water will ascend the wick and keep the bulb constantly wet. There will, of course, be evaporation from the wick surrounding the bulb; evaporation causes a loss of heat, hence, the dryer the air the greater the evaporation, the greater the loss of heat, and the lower will go the mercury in the wet bulb thermometer. The greater the difference in the temperature as shown

between the wet and dry bulb thermometers, the dryer the air. In the open air there is sometimes a difference of 26°. If we understand the matter, perspiration is more free, and a lower degree of temperature can be endured in a dry than in a moist atmosphere.

EXTRACTED.

Patents.

We have never read a fairer, more logical treatment of the apiarian patent question, than the following from the pen of R. L. Taylor. We copy it from the October Apiculturist. We most earnestly recommend its perusal by those who "think patents all wrong."

It seems there is a question arising among bee-keepers concerning the propriety of obtaining a patent on any article pertaining to bee culture. It is broadly asserted that the bee-keepers of this country are now generally of the opinion that it is not best to obtain such patents. I know not on what authority such assertion is made, but I trust it is not true. I am glad to notice that the Apiculturist has boldly challenged the statement, and it seems to me the matter is of such great importance practically as well as morally, that I have thought it worth while to say a word upon the topic.

It appears plain to me that the patent laws are beneficent in their effects to all; to the inventor in protecting him in his right to his own invention, and not less so to others who reap the fruit of his skill and study by reason of the laws furnishing him an incentive to apply his skill and study. Many are opposed to the granting of patents, but that is not a difficult thing to account for. Some are opposed because they are themselves destitute of mechanical skill and so imagine that a freedom to use the inventions of others would be the most advantageous thing for them. Others because, through a spirit of general charity, they think, though stumbled, perhaps, at the idea of taking the thought, time and money of the inventor without recompense, that the greatest good to the greatest number would come of a like freedom. Still others are manufacturers of bee-keepers' supplies and aim to make and keep for sale everything that is largely called for. Naturally enough, such desire about all the profit that can be obtained, and so would prefer that the inventor have no legal right to any part of it, and either shut him out from all financial benefit, or else only give him credit for a nominal sum to be fixed at the discretion of the manufacturer, and accepted as a gift. But all these overlook the great fact that every party to a transaction taken as a whole must receive a share of the profit, or transactions become infrequent

and business suffers. The drive wheels of a locomotive cannot say to the other wheels, give us all the oil, for that would create friction and locomotion would cease.

It requires time, thought, labor and money to make and perfect an invention, and certainly the laboring inventor is worthy of his hire. And if that is so, should he not have legal protection in his right?

And then comes the dissemination of the invention and the making plain its functions and advantages. How often when an invention has been patented, and its dissemination begun, does some one rise up and claim that he invented the same thing long before. He did not believe in patents, perhaps, and so seeing no hope of adequate reward, let his invention sleep in secret. The other, having hope of reward, publishes his discovery, and this so far as the public is concerned, is the chief virtue of an inventor. Without question, the knowledge of articles patented is more likely to be disseminated.

All effort is made through some incentive: and in the struggle for sustenance and a competence, there is only one incentive that moves all, and that is the hope of gain. Who will say it is best to take that incentive away?

It is said that patents give an opportunity for the commission of frauds. If that were true shall we abolish genuine money because it gives an opportunity for counterfeiting? But it is not the patent on an article that gives the power to perpetuate fraud. That is rather a safeguard, as the fee prerequisite to the use of the invention begets caution and careful examination. Fraud is accomplished through the effort made to disseminate a worthless article. To the simple, the fact that an article is proclaimed as unpatented, smacks of honesty, and they are easily caught by bait having apparently such an aroma. Thus, through advertising and other active efforts, a certain hive which is very inconvenient in use, and its making very laborious, and which is discarded by almost every bee-keeper having bees in any considerable number, as soon as he gains a little experience, is now selling to beginners more extensively than perhaps any other hive. Practically it operates as a fraud to a greater extent than all other bee-keeping articles with patents real or pretended combined. I speak from experience with the hive both practically and financially. A patent on the hive instead of increasing the injury, would have lessened it very materially. A few dollars' charge for individual rights has a wonderful effect in suggesting caution in the adoption of new devices.

Smokers furnish another case in point. The ones protected by patent are decidedly the best, and the ones heralded as unpatented are the ones to be shunned.

It is also objected that inventions are the work of many minds, and, therefore, a single person should not be allowed a revenue from them. It is true, no doubt, that inventors draw upon the common fund of knowledge amassed by others, but is he, who is acute enough, and studious enough, and devoted enough to combine that knowledge, and make it produce practical results, and

is, after that, sufficiently enterprising to bring it to the doors of the multitude, and to persist in explaining it until stubbornness itself shall admit its value, therefore entitled to no credit?

There is much food for thought in this subject, but time and space forbid its further pursuit at present, but let us intelligently consider, that we may get into a proper attitude with reference to it.

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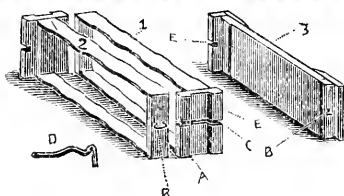
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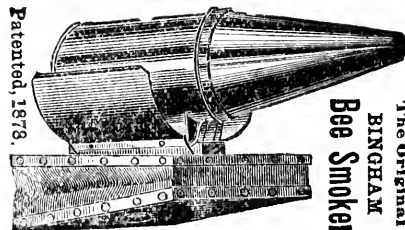
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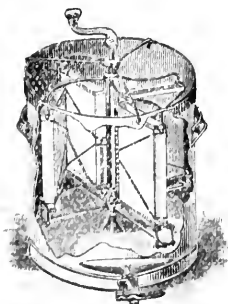
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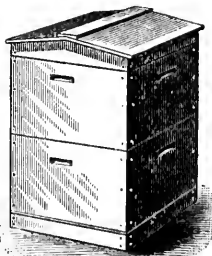
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THE BEE-KEEPERS' REVIEW


VOL. I.

FLINT, MICHIGAN, NOVEMBER 10, 1888.

NO. 11.

Moisture Unimportant except in Its Relation to Temperature—What's the Matter with Sugar?

JAS. HEDDON.

R. EDITOR:—(Of course I read your leader on the moisture question before beginning this article; and, as usual, you have gone over all the ground, leaving nothing for me except to sanction what you have said on my side of the question; and make known to my bee-keeping brothers what twenty years of experience have taught me. How perfectly to the point is your declaration that, if we do nothing more, we shall perhaps settle the question that the subject is of little importance. It seems to me unnecessary that I consume your valuable space in reciting all the particulars of different conditions under which my experiments have existed. I will not do so, but will say that I am positive that moisture is not a main factor in the cause of bee diarrhoea; the one great cause of our winter losses. The whole thing is in the food, *every time*, and temperature is the main *auxiliary* cause. When fed upon pure cane sugar syrup, stored in combs containing not one cell of bee bread, I had nearly 100 colonies winter perfectly in a damp cellar. Water and mould gathered under the covers and upon the alighting boards. The temperature was below the freezing point a great deal of the time; several times going below 20° F. Every one of those sugar-fed colonies came out in perfect health, without one particle of fecal accumulation; not even water was voided upon their first flight. If I could believe that moisture played any special part in the wintering of bees, I should believe a moist cellar better than a dry one.

You have been over all the ground in your introductory remarks in the last Review, but I may repeat and say that my experience sanctions this; that as temperature has much to do with bee diarrhoea when the food is bad, so, again, moisture has much to do with temperature; for humidity in the atmosphere makes the effect equal to a much lower temperature. Were I keeping my cellar at 55° or 60° I should prefer an atmosphere laden with moisture; if at 35° to 40°, I should prefer to have it dry; and yet, the whole question is one of temperature. Moisture plays no part only as it influences the effects of

temperature. By the foregoing, it will be seen that if the temperature is below 45°, and the atmosphere moist, the remedy is a fire which will have a tendency to displace the moisture and raise the temperature.

The same as regards the matter of ventilation, as I expressed myself in your last number, I do not care to go to any expense in the matter of moisture in my bee cellar, as I am at this time controlling all these matters with a stove in an adjoining room.

The mills grind slowly, but I firmly believe that, ere long, the pollen theory will be understood; and our bee-keepers will all know that the consumption of nitrogenous food, when the bees are confined and cannot void, is the *one* cause of our winter losses, and that all other conditions cut no figure except as they aggravate or ameliorate the direct cause.

Friends Boyer and Burrell only echo my own views, or in other words I can echo theirs in regard to the certain death of bees with sugar syrup for winter stores when that syrup *crystallizes*. Many are the times that I have wintered bees on sugar syrup, and no honey is its equal when it remains liquid; but when it crystallizes nothing is surer death. I have been caught with this crystallization, and all I can say is: "What can be the matter with our latter-day granulated sugar?" In years gone by it did not crystallize when treated exactly as we now fail with it. Well, I have overcome the difficulty by mixing in one-third or one-half honey.

DOWAGIAC, MICH.,

Nov. 3, 1888.

Moisture to be Avoided—Its Relation to Temperature and Ventilation.

H. R. BOARDMAN.



WHEN wintering out of doors, bees will withstand almost any degree of cold so long as they are kept dry; but, to a low temperature add moisture, and we have a condition within the hive that is very destructive. I am not satisfied that moisture within the hive is under any circumstances a benefit, absolutely and permanently, to the bees; yet I am not very radical upon this point. That the bees do sometimes utilize the moisture condensed within the hives, when they would be

able to get it in no other way, I am satisfied of beyond a doubt; and while I am not sure of any benefit from the presence of moisture in the hive, I am absolutely certain that it is often a cause of injury. But, even though the air in the bee room is not dry, moisture rarely condenses within the hives to any considerable extent if the repository is kept at a favorable temperature and hives reasonably ventilated; and this is one of the important advantages gained by in-door wintering—the temperature can, to a certain extent, be controlled. With a low temperature in the bee-room we will find the moisture running out of the hives, and no effort to keep the air dry will avail in *entirely* preventing it.

We are quite apt, I think, to overlook the principal manner by which moisture finds its way into wintering repositories. Direct ventilation from the outside brings together bodies of air possessed of different temperatures; and the result is condensation of the moisture and a damp repository. My bee houses are built in such a manner as to avoid any ventilation direct from the outside. This is done by having an extra room, connected with the bee room, and into which the outside door opens. In admitting a fresh supply of air, for the purpose of controlling the temperature, this arrangement is particularly valuable; and I would not omit it in any plan for building a wintering, bee repository.

There has been considerable speculation, from time to time, in regard to the influence of springs or streams of water in the wintering repository. I cannot think they do either very much good or harm. There is, in this respect, much straining at a gnat and swallowing something very much larger. We might look at a pool of water on the floor as a serious thing and be annoyed by it, and yet, while we opened the door to expel it a much greater amount would rush in with the incoming air, and be condensed upon everything with which it came in contact.

Some years ago, a man of my acquaintance had a vegetable cellar in which the temperature went very low during the winter. Towards spring there came a warm day, and, very naturally, it occurred to him that the cellar might be warmed up by opening the outside door and admitting the warm air. Accordingly, the door was left open. Upon going into the cellar a short time after, what was his surprise and astonishment to find everything dripping with moisture! You say, no doubt, that he ought to have known better. He does now; he has learned that ventilation does not always carry the moisture out; that it sometimes brings it in. This same thing happens with the bee house or wintering repository, or the colony wintering out of doors.

And let me say here, although not strictly upon this subject, that the honey room in which is stored comb honey requires the closest attention and care to avoid moisture from this source.

But, is there anything to be gained by keeping the bee house dry? Is it any better for the bees? I think it is. If the room is cold, moisture is a positive injury. If warm, mould and decay seize upon everything per-

ishable, and we have the revolting spectacle of death and decomposition—a condition better fitted for a sepulcher than a room for bees to even *hibernate* in.

Although moisture does not seem to be directly fatal, I cannot be satisfied with a wintering repository in which the bees are to live nearly one-half the year, that is saturated with moisture, wreaking with mould and decay and filled with unpleasant odors. If at any time I cannot go into the bee room, close the door, and remain some time without a sense of oppression or discomfort, I feel that the conditions are not entirely favorable for the bees.

I have always endeavored to keep my bee rooms as dry as possible, using lime to absorb the moisture; and, so far as I am able to judge, a dry repository has given better results in wintering than one where moisture prevailed.

EAST TOWNSEND, OHIO.

Nov. 3, 1888.

Moisture and Ventilation.

DR. C. C. MILLER.

I MUST a very little about moisture. I have noticed that, in the spring, when warm days come, but before the bees are taken out of the cellar, if the outer air runs up to 50° or 60°, it is much more difficult to keep the bees quiet in a moist than in a dry day. Possibly it may be that the air being lighter when moist, ventilation of the cellar is less complete; for, with all that has been said about ventilation not being needed, what ventilation *is* needed is needed.

MARENGO, ILL.,

Nov. 3, 1888.

Moisture and Temperature.

EUGENE SECOR.

NOTWITHSTANDING all that I have heard and read about the dire effects of moisture in bee repositories in winter, I have come to look upon it in about the same light, as regards its effects upon bees in a cellar, that the majority do (and myself with the majority) regarding ventilation—of no importance if conditions are right.

About five years ago I put a hot air furnace in one of the four rooms of my cellar. Since then the cellar is quite dry; although, as a rule, the doors are closed between the apartments. The bees now go through the winter rather dryer than formerly, but I do not attribute the difference in that respect so much to the dryness of the cellar as to the fact that they are kept warmer than before.

In common with a great many novices in bee-keeping, I once thought that cold would not injure bees in a cellar. "If they can endure 20° below zero out of doors, why can't they stand 20° above in a cellar?" we argued. I don't argue that way now. I have come to

believe that there is a vast difference between a *dry* atmosphere and a *damp* one at the *same* temperature; and that a damp cellar needs to be kept warmer than a dry one. If, therefore, a damp cellar is kept at the proper temperature, so that the moisture will not condense on the inside of the hives, I should have no fears that the combs would become mouldy. Experience and observation confirm this view.

In my opinion, therefore, the way to avoid any ill effects of a too damp cellar is to regulate the temperature. Never allow it to reach the freezing point. It is better if it is never below 40°.

P. S. A part of my bees have been in the cellar a week, although the weather is as fine as could be wished for in autumn. We never tire of experimenting, you know.

FOREST CITY, IOWA,

Oct. 25, 1888.

Moisture—How to Avoid It and Its Effects.

J. H. MARTIN.

THAT moisture, either in the cellar or open air wintering of bees, is of vital consequence is attested to by the experience of a host of bee-keepers. Why it should be present at certain times, and how to avoid it, is like many other questions that are unsolved. Bee-keepers have been so busy getting rich by securing great yields of honey, that these little matters of moisture, etc., have received but little attention.

Let us see if from our experience we can glean a few helpful hints upon this important subject. We know that if we winter bees in an upper room of an occupied dwelling, the hives and bees will have the highest degree of dryness; and, but for the variable temperature in such a room, bees could be wintered successfully there every time; at least so far as moisture would have any fatal effect upon them. To overcome the variability of temperature we go below the surface of the earth, or into the cellar; and here we many times have to contend with moisture, though the ventilation be ever so perfect. There has been much written about all of these points, but no definite rule has been eliminated. Now let us see if we cannot lay down at least one rule that will account for much of the moisture existing to the detriment of wintering bees in a cellar. Our rule or law is this: a cellar dug in a loose or gravelly soil may have a spring of water in it, or water flowing through it, and the moisture will do no harm to bees, or to articles stored in the cellar. A cellar dug into hardpan or only partly into it, will hold moisture, cause mildew and mould, and the effect will be bad upon bees placed in it. A cellar dug into a rock where the layers and seams will not carry off water is as bad as one dug in hardpan, while, if the seams are such as to drain off water the cellar will be dry. A cellar dug in clay soil, though the soil be very compact, is not so retentive of moisture as one dug in hardpan. A simple test as to the amount of moisture in a cellar consists in laying a flat stone down near the ground; if

it collects moisture, or drops of water, on the under side, it is evidence of too much humidity. A cellar in hardpan, or even in clay, can be much improved by digging down two or three feet and filling in with stones at first, then with gravel, and finishing up with a covering of cement. We have seen a very moist cellar converted by this plan into a dry, healthful repository for bees.

There is another point in relation to putting bees into a cellar. If hives to the amount of fifty or more are piled into one cluster as closely as possible they will not be affected by moisture so much as though placed around on shelves; and the centre colonies will come out bright, dry and healthy.

A very good example of moisture and its fatal effect is often observed in the out door wintering of bees. A colony may become covered with snow to a great depth, and if the temperature remains low the bees will be dry and healthy under their frigid mantle, but should there be rapid thawing during the day and freezing at night, moisture collects in the hive, moulding the combs and enfneebing if not destroying the bees. If the bee-keeper gets the snow away from the hives as soon as the thawing commences, all will be well; or if the hive is elevated sufficiently above the snow the effect will be healthful for the bees.

I think "moisture" is a neglected point in our study and discussions, while it is more vital to the safe wintering of bees than are many subjects upon which volumes have been written; and I trust some of our scientific apiarists will give us some valuable hints upon this subject.

HARTFORD, N. Y.,

Oct. 25, 1888.

Influence of Soil on Cellars.

O. O. POPPLETON.

SOME two or three years ago I called attention to this point and J. H. Martin also does in the Feb'y "REVIEW." Its importance seems to have been almost entirely overlooked. My apiary in Iowa was situated in the valley of the Uapsipinicon river, the soil of which was of a peculiar damp cold nature, and I do not know of a single person living in that valley who has successfully wintered any number of bees in a cellar during a term of years. The only successful ones were those who used chaff hives. A few miles only to the East and to the West of my place, the land was drained by the Turkey and Cedar Rivers, and the soil was of a much drier, warmer nature. In those valleys, cellar wintering was practiced with excellent success by many. After much study of the subject I became convinced that the character of the soil in which our cellars were made was the reason of our non-success. While attending the Iowa State Conventions, I made it a rule to ask everyone who claimed to succeed in wintering in cellars or caves, whether their cellars were damp or dry, and without a single exception the reply was "Dry." Many said, "Dry enough to be dusty."

Many have made the mistake of calling a cellar wet because it has water in it, but the injury from that source isn't to be compared for an instant to the trouble caused by the soil surrounding a cellar being of a cold damp nature.

The mass of testimony we now have points to the fact that such cellars can probably be used successfully by keeping them at a higher temperature than dry cellars need to be kept at, and it will pay for all having damp cellars to keep this in mind.

You, Mr. Editor, are fortunate in living in a sandy section of country, where situations with cold, damp soils are the exception, while I am now fortunate enough to be where winter has lost its terrors.

HAYANA, CUBA, April 5, 1888.

No Injury from Moisture—Water an Aid in Controlling Temperature.

PROF. A. J. COOK.

I FEAR I cannot say much on this question of moisture. I do not feel nearly so anxious for a dry cellar as I once did.

Our old cellar had water in it all the time, and it was a splendid cellar. Of course the mere presence of water does not necessarily imply a moist atmosphere; but often the atmosphere was very damp, as shown by the damp walls and the mould that would collect on suitable bodies in the cellar; yet, for many winters, that cellar was a perfect success, the bees always coming out in good shape. I should like to have water in my cellar, just as the dairyman desires a spring cellar for his work. Still, I am not sure that the water in the cellar accomplishes anything more than to preserve a uniform temperature and prevent sudden changes.

To recapitulate then, I am sure that water, or even moisture, in a cellar are not inimical to bees placed in it during winter. I believe the water is a good thing. My theory is that it aids by preserving a uniform temperature.

AGR'CL. COLLEGE,

Oct. 24, 1888.

Injurious Effects of Moisture Easily Avoided.

R. L. TAYLOR.

SO FAR as I have been able to discover, there is nothing that would lead me to suppose that moisture affects the welfare of bees in any respect differently from the manner in which it operates upon the well-being of the larger animals. The problem involved in "Moisture" seems to me not to be a difficult one if we remember two facts; viz., that heat expels moisture; and that moisture furnishes an excellent medium for the escape of heat. So, it is evident that, in the discussion of this question, these two elements must be taken as inter-

dependent; that is, what might be an injurious amount of moisture in one case might be perfectly harmless in another, owing to the existence of a higher temperature.

And it is plain that this matter of heat presents two aspects; viz., the internal heat, so to speak, of the clustered colony, and the temperature of the surrounding atmosphere. Each should be taken as complementary of the other—the higher the one the lower the other may be permitted to be. The well-fed, fat and vigorous ox throws off the moisture left on his sleek hide by a shower, in clouds of vapor, even in a low temperature; while an ox of low vitality, ill-fed and lean, in the same temperature would remain wet and shivering; but if the temperature were sufficiently raised he would throw off the moisture equally as well as did the other in the lower temperature. We must recognize the same distinction between strong, healthy colonies of bees and those weak in numbers and vitality. While I say this, I do not think there is anything to fear from the moisture of any ordinary atmosphere. There is no danger from moisture in the dampest of cellars, only it will not answer to arrange the hives and their trappings so as to collect the moisture. If there is much moisture, the temperature must be under control and kept well up; and the hives so arranged as to favor the expulsion of the moisture. All that is necessary in order to guard against any ill effects, even from a saturated atmosphere, is well-fed colonies of fair strength, in well ventilated hives, kept in a temperature of from 45° to 50°.

A cellar can scarcely be so dry that moisture will not drip down the inside of the hive if the temperature be low; and while this indicates too little warmth, it is not necessarily injurious. The important point is to keep the moisture out of the cluster; hence it follows that the fact that the moisture is so great that mould gathers on the comb is not in itself any proof that the conditions are unfavorable to the well-being of the bees.

Having had considerable experience with both damp and dry cellars, I am firm in the belief that there is nothing to fear from the effects of any atmospheric moisture, if one only bears in mind the principles above hinted at; providing the conditions indicated which will enable the bees to drive that moisture away from the cluster.

LAPEER, MICH.,

Nov. 9, 1888.

How to Secure Better Ventilation for Hives with Fast Bottom Boards.

O. O. POPPLETON.

WHILE writing an article, several years ago, for one of the bee journals, I incidentally spoke of a method of arranging hives in the cellar that is practiced by the well known bee-keeper, Dr. Jesse Green, of La Porte, Iowa, which, I think, it may be well to de-

scribe more fully than I did there, as it has a direct bearing on hive ventilation; that is, with hives having fast bottom boards.

Instead of setting the hives level, or nearly so, as they stand in the apiary, and with their fronts to the alley, as is usual, he sets them up at an angle of 45°, with one of the sides of each hive next the alley. Each hive, as it is brought into the cellar, is leaned against the preceding one. When the first tier of hives is in place, a wide board is laid upon it, then upon this is placed another tier, and so on. The hive entrances are left open full width.

This method of placing the hives accomplishes three things. First, it keeps the hives clear of dead bees and rubbish; second, it secures more perfect ventilation; third, it converts shallow hives into deep ones for the time being. This last point is one on the value of which bee-keepers differ. In fact, I believe you and I do; but no one, I think, claims that shallow frames are superior to deep ones for wintering.

HAVANA, CUBA,

Sep. 29, 1888.

Moisture in Bee Cellars.

S. CORNELL.

YOU ask: "Is it an advantage to have the air of our bee cellars dry? Or do the bees winter more perfectly in a moist atmosphere?" The most reliable experiments that have been made as to the effects of moisture in bee cellars are those of Mr. N. W. McLain, as given in his report of 1886. In his remarks on the conditions necessary to secure the minimum of functional activity within the hive he says: "37° F., in a dry cellar, is a danger point; the danger increasing in proportion as the temperature is lowered or the humidity of the atmosphere is increased." After recommending 44° as the safest temperature for the repository, he says: "If the repository be damp, a degree of temperature higher in proportion to the dampness should be maintained." Referring to this statement, Mr. Frank Cheshire says: "The reason being that water has an enormous capacity for heat (specific heat) whether in the liquid or vaporous form; the latter abstracts heat from the bees and intensifies their struggle." Dr. Youmans says: "Air which is already saturated with moisture refuses to receive the perspiration offered to it from the skin and lungs, and the sewage of the system is dammed up." This occurs when the saturated air is of the same temperature as the body. A fault I have to find with Mr. McLain is that while he gives the temperature of the air he does not give the percentage of saturation he had when the air was "dry" or "moist."

Perhaps the best means of drying damp air is to expose a large surface of sulphuric acid or a large quantity of newly burnt lime. The acid has a great affinity for moisture, and is not very expensive. A bushel of lime

absorbs twenty-eight pounds of water in the process of slacking. But, as neither of these is likely to be used by the average bee-keeper, we must find some other means of overcoming the effects of a damp cold atmosphere. I have shown, above, the effects of moist air at the temperature of the body. There is no reason to doubt that such conditions would injure the bees as much as ourselves. The temperature required to be maintained in the cluster is 65°. Suppose the temperature of the cellar is 43°, and the air completely saturated with moisture, by the time the air reaches the centre of the cluster, and is raised to 65°, the degree of saturation will be only fifty per cent., because air at 65° will hold just about twice as much moisture as air at 43°. This is why bees may winter well in a very damp cellar when they have all the necessary means for keeping up a temperature of 65° in the cluster. The ease with which this temperature can be maintained depends upon the non-conductivity of the hive, the quantity of bees, their facilities for getting into a compact cluster, the condition of the air of the apartment as to humidity, the ventilation of the hive, and, of course, upon the quality of the food. I have forty hives with cork dust filling, and twelve straw hives in all of which the combs extend diagonally towards the centre, in the manner shown in the cut on page 280 of the A. B. J. for 1885. These hives are covered with quilts of wool, and are raised above the bottom board two inches; the ventilation being so arranged that neither the inlet nor the outlet can possibly become closed. As to upper or lower ventilation, it matters not which, provided the heat of the bees is not unnecessarily wasted. But ventilation in some way must be had; because it can be shown that when bees consume only half an ounce of honey per day the air in the hive needs to be changed every half hour.

A correspondent in a recent number refers to Prof. Cook's hive which was hermetically sealed with ice and then had snow shoveled over it and was left sealed (?) for three months. Having always seen that the heat of the bees melted the snow around the hives, I never had any confidence in this experiment. Not but what I have every confidence in Prof. Cook's statement, but I think there must have been some mistake in the observation.

You say: "It must not be forgotten, however, that water in a cellar does not necessarily cause moisture in the air." If this were so there would be no evaporation from lakes, rivers and ponds; and no clouds. Your error seems to lie in mistaking *absolute* humidity for *relative* humidity. A few years ago I put down a sub-earth pipe, using glazed tile to exclude ground air and water. The bottom of the excavation had quicksand in places, and when the earth was filled in its weight caused the pipe to sink, breaking the joints and letting in the water. The air came in through this pipe almost saturated; while, with the pipe closed, the percentage of saturation was about eighty.

LINDSAY, ONT., CANADA,

Nov. 8, 1888.

The + Bee-Keepers' + Review, PUBLISHED MONTHLY.

W. Z. HUTCHINSON, Editor & Proprietor.

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FLINT, MICHIGAN, NOVEMBER 10, 1888.

YORK STATE CONVENTION.

The N. Y. bee-keepers will hold their convention in the City Hall, at Syracuse, Dec. 11, 12 and 13. Exactly when the Michigan folks are going to hold theirs. Why wouldn't it be a good plan to hold conventions between Christmas and New Year's, when we can go on the railroads at half fare?

A GOOD FALL CROP.

According to the statistics that appear in *Gleanings* for Nov. 1, the fall crop of honey has generally been quite bountiful; and, taking the season as a whole, about half a crop has been secured. The average price of comb honey is a trifle over 19 cts. Extracted, a little above 12 cts. But little fall feeding will be done, as the bees are mostly supplied with natural stores.

THE CANADIAN HONEY PRODUCER.

In the last number of the REVIEW we spoke of the improvement in bee journals resulting from the attendance of the editors at bee conventions. That number was scarcely mailed before the *Canadian Honey Producer* for November came to hand, furnishing a most excellent illustration of the truth of our remark. It is the best issue of that paper. The excellent report that it gives of the Columbus convention shows that no mistake was made in electing Bro. Holterman as secretary. This paper also gives the only description we have yet seen of the Bee and Honey exhibit at the Ohio Centennial.

MICHIGAN STATE BEE-KEEPERS' CONVENTION.

The Michigan State Bee-Keepers' Association will hold its twenty-third annual meeting, December 12 and 13, in the City Council Rooms, at Jackson. A programme is being prepared, and, from the excellent papers al-

ready promised, an interesting time may be anticipated. We think it safe to say that the meetings held by this Association are never outdone by any other state convention. Down at Columbus we heard several speak of this. "We never have such conventions in our state as they do in Michigan." "I don't see why it is, but they do have such splendid conventions up in Michigan." Such were the expressions heard. We are proud of "Michigan my Michigan;" and not the least of our pride is in her oldest and best bee-keepers' Association. We may not all feel able to travel long distances to attend conventions, but let us rally to our own home gathering; extending a warm welcome to all who may come from "distant lands."

CONTRACTING THE SURPLUS ROOM IN SUPERS.

In our editorial upon "Sections and their Adjustment on the Hives," we speak of the objection brought against cases and supers that their capacity cannot be contracted, and this often results in an increased number of unfinished sections. Dr. Miller tells in the last number of *Gleanings* how their capacity may be contracted. It is accomplished by leaving out one or more rows of sections, and covering the open space at the bottom of the super by laying in side pieces of sections. Simple as it is, the Doctor says he had never thought of the plan until this year. Why, bless you Doctor, we supposed *everybody* had thought of it, (we hope you don't feel hurt Doctor) and that it was not practiced because of its fussiness. Perhaps it brings in no more labor than the caring for the unfinished sections that result from allowing the bees access to the whole super until the close of the honey harvest.

MOISTURE AND ITS RELATION TO THE WINTERING OF BEES.

The burden of the testimony is that moisture plays but an unimportant part in the wintering of bees, except as it relates to temperature. But little moisture is required to saturate cold air; that is, it will absorb but little moisture, the point when it will receive no more being soon reached. As the temperature rises, the absorbing capacity of the air increases. When air of a high temperature, at that of our bodies, or nearly that, is saturated, or nearly so, with moisture, the exhalations from the lungs and skin are ta-

ken up but slowly; we are oppressed and say the weather is "muggy." This explains why we feel better on bright, clear days. Heating air increases its power of absorption, hence we enjoy a fire upon a damp day. If the air of a cellar is dry, it will be readily seen that the temperature may be allowed to go much lower. In other words, a cold, dry atmosphere, or a warm, damp one, may be about equal, so far as effects are concerned. We fear this point has not been sufficiently considered. We have had many reports of the successful wintering of bees at such and such a degree of temperature, but nothing is said as to the degree of saturation. We wish bee-keepers would use a wet-bulb thermometer in their cellars; it would not be the work of half an hour to arrange one; then let the degree of saturation be given with that of the temperature, and we will have something approaching accuracy. We say "approaching accuracy," because the strength of the colonies and the manner in which they are protected, have a bearing. A populous, well-protected colony can warm up the inside of the hive, expelling the moisture and increasing the absorbing capacity of the enclosed air. Building a fire in a room on a damp day is the same in principle. While it is true that moisture may be brought into the cellar with air from the outside, we do not think this is the case in the freezing cold of winter. Frozen air, if the expression is allowable, has a very low point of saturation. That is, it will hold but very little moisture; and when it is brought into the higher temperature of the cellar its capacity for absorption is greatly increased—it is ready to receive water instead of giving it out. When the outside air comes into a cellar and deposits moisture upon the objects therein, it is evident that the incoming air is warm and moisture-laden—warmer than the cellar and its contents. Mould in bee repositories is usually looked upon as something undesirable, and we will admit that its appearance is far from pleasant, but we must not forget that, in a certain sense, it is a plant—the child of warmth and moisture—and that the conditions necessary for its development may not be injurious to the bees—*may* be more beneficial than a condition under which mould does not develop, viz., one of moisture and cold. A very damp cellar ought to be warm enough for the development of mould. But the cellar need not be damp. It can be made both warm and dry. These matters of tem-

perature and moisture are under our control. Either by fires, or by going into the earth, preferably the latter, we can secure the proper temperature; and, by the use of lime to absorb the moisture, a dry atmosphere can be secured. Certainly, it is not much trouble to keep unslacked lime in the cellar. While it is evident that moisture in ordinary cellars is not injurious, provided the temperature is high enough, it is a great comfort to know that there is nothing to fear from a dry atmosphere; that we can indulge our fancy, if you choose to call it that, for dry, sweet-smelling, mouldless cellars, and know that the results will at least be harmless.

DR. C. C. MILLER'S REVIEW AND COMMENTS ON
THE A B C OF BEE CULTURE.

We presume there is not one of our readers who has not read the A B C of Bee Culture, and who does not know that the type for printing this book is kept standing, and that corrections and revisions are constantly being made in order that it may always be "up with the times." A copy of the latest edition (37th thousand), just out, lies before us. This edition has been more thoroughly revised than previous ones: much new matter, especially in regard to Comb Foundation, Comb honey, Hive Making, Queen Rearing and Swarming, and many new engravings being added. Some excellent biographies and splendid pictures of some of the leading bee-keepers form a special feature of this edition.

A few years ago Mr. Root employed Mr. G. M. Doolittle to review and criticise this work, and Mr. Doolittle's views were published in the back part of the book. He has now secured the services of Dr. C. C. Miller in this line; and his comments appear for the first time in this edition. The Doctor has touched upon something more than 100 points, but we can mention only some of the most important.

In cutting out queen cells to prevent after-swarming it is well nigh impossible to be sure that none are overlooked, and all may as well be left as more than one.—The Doctor cannot give up all hope that some day we shall know enough to profitably keep down the *desire* for swarming, when working for comb honey.—He has failed in making Alsike a profitable crop.—In fastening in foundation he succeeds better with *pressing* than with *rubbing* the foundation into

the wood.—No matter how much or how little contraction is practiced, the Doctor would still put, in the first super given to a colony, a previously worked out section as a bait.—In regard to what is the proper name for the well known malady that sweeps away our bees in winter, he asks: "Is not diarrhoea a better name than dysentery?" (If we understand the matter aright, there is an inflammation of the intestinal lining, hence; dysentery would be the more correct term. Ed.) Our friend prefers entrances $\frac{1}{2}$ inch in height. We agree.—Honey improves in the keeping of the bees; but unsealed honey may be improved after being extracted.—Like ourselves, our critic takes issue with Mr. Root upon the subject of adding tartaric acid to sugar syrup to prevent its crystallization when fed to bees. He would not omit it, while Mr. Root thinks its addition unnecessary.—Dr. Miller has always had plenty of hybrids, but they have been well behaved. He thinks they do not deserve the reputation given them by Mr. Root.—He very successfully introduces queens by simply lifting out from the nucleus the comb upon which is the queen, and putting it, bees and all, into the queenless hive. We have often done this, and, usually, it works all right.—The Doctor has wintered many colonies, two in a hive; with a $\frac{3}{4}$ division board between them, and he *always* found the two colonies practically in one cluster.—For transferring larvæ, in queen rearing, he has used a joint of grass or timothy, giving it a slanting cut with a sharp knife.—In clipping queens he cuts off both wings on one side. If only one is cut it does not show very plainly, and a queen is sometimes caught to be clipped when she has already been clipped. In clipping queens he catches and holds them by the shoulders with the thumb and finger of the left hand, while he cuts off the two wings on one side. Just as we do it.—He very properly objects to the rearing of queens in hives containing no young bees.—In speaking of Rocky-mountain bee-plant, Mr. Root says, if there are many plants, it will be a good plan to cultivate them the same as field crops. Our critic says: "I'm afraid the honey wouldn't pay for the work, even if the land cost nothing." And Mr. Root admits that, at present writing, he quite agrees with him. We all three think alike.—In transferring, the Doctor no longer makes "patchwork" of the old combs, but uses foundation.—He doubts the advisability of uniting weak colo-

nies in spring.—He has found that entering the cellar or jarring the hives does not make anything like the difference that it seems to him that it ought to make.—At present he keeps fires nearly all winter in his cellar, but is looking forward to the time when, with better cellars and more knowledge, he may leave his bees with no care the entire winter.—He says the opinion is gaining ground that, during the spring, when packing might be desirable, bees are better off in the cellar.—It may be well to remark, says our friend, that many think the discouragements of out door wintering greater than those of in door.—He says he has found it just as well to put two hives in the place of one in the apiary; putting them in pairs as close together as possible without their touching.—He is opposed to the hexagonal arrangement, preferring the hives in straight rows, all facing one way, as swarms are then more readily seen.

WINTERING BEES IN CLAMPS.

Several subscribers have asked for a description of our method of wintering bees in clamps; or, in other words, by burying them. After an experience of several years with both clamps and cellars, we can say, most cheerfully, that we have found no advantages in clamps not possessed by cellars. We say "cheerfully" because the work of putting bees into a clamp and taking them out is decidedly task-like; and we are glad to know that, when a cellar is available, no necessity exists for a clamp.

The number of colonies that we have placed in one clamp has varied from six to sixty-four; and the only experiment in this line that turned out disastrously was when the clamp contained the last mentioned number. Notwithstanding the views expressed in the last Review against the necessity of ventilation, we *believe* that our loss—a loss, in this instance, of seventy-five per cent.—was caused by a lack of air. The hives were placed in a compact body and covered very deeply—about two feet deep. There were almost no traces of disease; the hives, combs and bees were dry and clean; but the bees were dead. Some of the hives were entirely deserted. In others the bees were nicely clustered but *dead*. Perhaps the covering of them so quickly, before the excitement attending their disturbance had subsided, was one cause of the disaster; the large number of excited colonies crowded into the

smallest possible space greatly increasing the need of air. When the hives were placed in a row, or even in two rows, side by side, we have had excellent success.

We are fortunate in having our apiary located upon a sandy slope: and at its upper edge we bury our bees. First we dig a trench five feet wide, with sides sloping at an angle of 45°. The length of the trench depends, of course, upon the number of colonies we wish to bury. Some pieces of oak fence posts, about four feet long, are placed, two feet apart, across the trench: the ends of the posts resting in notches dug in the sloping sides of the trench. When these "sleepers" are in place their upper sides are a foot below the surface level of the earth. The space below them is filled with dry straw, then strips of board are laid upon them to form a floor upon which to place the hives. After the hives are in place—set in two long rows—they are surrounded and covered with straw to the depth of two or three feet. Along the centre and lengthwise of the pile of straw some boards or rails are placed: then fence posts, pieces of rails, or something of the kind, are leaned against the pile of straw, their upper ends resting upon the boards or rails laid along the centre of the pile, while their lower ends rest upon the ground. These stakes, or posts, surrounding the pile of straw, are placed a foot or less apart: and their object is that of furnishing a support to the covering of earth. When these supports are in place; another coating of straw, a foot thick, is added: then the earth is shoveled on to the depth of a foot or eighteen inches. With the exception of one winter, no provision was made for ventilation. That winter, a tube, 2 x 3 inches in diameter, extended from the top of the mound down through the covering to the boards that supported the hives. This tube was not put in for the sake of ventilation, but to allow a thermometer to be let down and drawn up by means of a string. We may remark, in passing, that the bees wintered no better that winter than in other winters when there was no ventilation. The temperature remained at 46° the first few days; then sank to 44°; stayed there a month or more: then went gradually down to 41°, where it remained nearly three months, when it gradually began to rise, and stood at 45° when the bees were removed in the spring.

We now have an out-door cellar in the side hill near the apiary. In this cellar 150 colo-

nies can be stored; and the work of construction would be equaled by that required in "clamping" and "unclamping" that number of colonies. Still, rather than attempt to winter bees in the open air with no protection we would put them in clamps; and should do so with full faith in their wintering excellently.

THE POLLEN THEORY.

In the last number of the *Bee-Keepers' Guide* the so-called "pollen theory" receives a most thorough "hauling over the coals." The arena of action is in the "Query Department." The first "round" is "only in fun," and comes in this shape: "Is pollen any more injurious to bees than bread made from wheat flour is to the human race?" After Dadant & Son say: "It does not bear the same relation to the bees that bread does to man;" and H. D. Stewart has remarked that: "Pollen is a *natural* food for bees, while bread is an *artificial* food for the human race," it is not worth while to repeat the remarks of the opposition. The next blow is struck in sober earnest. Listen, "Do you consider pollen the cause of dysentery with bees in winter?" Mr. Doolittle does not: and gives as a reason that he has removed all the pollen and yet the bees perished with dysentery. Dadant & Son admit that it helps by filling the intestines of the bees: but say that no injury results unless the intestines are overloaded for a long time. Next comes the following: "Is the fact that Prof. A. J. Cook found pollen grains in the secretions of bees affected with dysentery any proof that pollen was the cause of the disease?" Of the ten men who reply not one is willing to admit that it is proof. Following this comes another round "just in fun." Read this: "If the statement that pollen consumed by bees during cold weather and in confinement causes dysentery, be admitted, do you think that healthy, comfortable bees would be so foolish as to eat it?" Dadant & Son say: "Pollen does not, *alone*, cause diarrhoea, but it loads the bees' intestines more than pure honey and compels them to discharge their abdomen oftener." Mr. Doolittle is satisfied that bees eat pollen only when brood is being reared. Mr. Doolittle is mistaken. Bees have died of dysentery early in the winter, when there was no brood in the hive, and had not been for two months, yet their in-

testines were loaded with pollen. Mr. G. W. Demaree remarks as follows: "The editor of the REVIEW says it is 'evident that nature has made a mistake somewhere.' It is not clear just what Mr. Editor of the REVIEW means by nature. If the whole matter has been left to Mr. Hutchinson's 'nature,' there may be some *mistakes* made by that indefinable and indescribable something. But the 'Judge of all the earth' has made no mistakes. In His all seeing wisdom He has provided pollen and honey as food for bees, and bees feed on the food provided for them without harm." Bro. Demaree, if bees feed without harm upon the food furnished them by the Judge of all the earth, will you please tell us what it is that He furnishes that causes the dysentery? In the last "round" there was a little unpleasant circumstance. Read the following: "Is not the whole *aim* of the pollen theory to divert the attention of common bee-keepers, causing them to relinquish their efforts in providing ample protection from the cold, and an abundance of good honey or sugar syrup for the winter, thereby causing great losses of bees?" That one little word "*aim*," that we have italicized, was misunderstood. It was thought that the *motive* for promulgating the pollen theory was under discussion, and some of the replies are very unpleasant reading. It is a pleasure to note that some of the replies, although opposing the pollen theory, are loud in their defense of the sincerity of its advocates. Bro. Hill explains that there was no intention of accusing any one of dishonesty, and that "effect" or "result" would have expressed the real meaning intended much better than the word (*aim*) which was used.

It is evident, notwithstanding the volumes written upon the subject, that the pollen theory is not perfectly understood. "Why," says one, "my bees have an abundance of pollen, and they don't have the dysentery. This shows that there is nothing in the pollen theory." Pollen in the hive does not cause dysentery unless it is consumed in large quantities and the bees are confined a long time. It may be asked why the bees consume the pollen in some instances and in others do not, and we can answer very easily by saying we don't know. There is probably more than one cause, and while we can end all trouble by removing the pollen, it is more hopeful and more practical, we believe, to study the causes that lead to its undue con-

sumption. The most practical suggestion that we have to offer is this: have young queens that will keep up breeding later than old queens: contract the brood chamber so that it will be kept well filled with brood; and the end of the honey harvest will find but little honey or pollen in the combs. When the brood hatches out there will be cells in which sugar syrup may be stored. The syrup will be stored in the center of the hive where the bees naturally cluster; and, if kept in a proper temperature, there will probably be little seeking after pollen until brood-rearing at the approach of spring requires its consumption.

SECTIONS AND THEIR ADJUSTMENT ON THE HIVES.

This is to be our special topic for December. It may be asked, is it seasonable? We reply that it is. A decision in regard to the kind of sections we will use and the style of surplus receptacles in which they will be handled must be arrived at sufficiently in advance of the honey season to allow us to make or secure these supplies. If a bee-keeper can make more money by adopting a different style of section, super, or method of adjusting and manipulating the sections upon the hives, he would be glad to know it; and particularly would he be glad to come into possession of that knowledge at a time when he has the leisure of winter before him in which to make the change.

How earnestly we do wish that we could say or do something that would induce bee-keepers to look at their business in a business like way; to lead them to try and "secure the greatest results with the least expenditure of capital and labor." Only those who have kept a dollar and cent account with their bees fully realize that *labor* is the most expensive item entering into the cost of honey. Let us suppose that a man cares for 100 colonies, and by a series of crooks and turns and complicated methods he secures a good yield; a yield somewhat increased we will suppose by the laborious manipulations. Let us suppose, still further, that by improved methods and fixtures he can manage 150 colonies equally as well with no greater expenditure of labor, it is evident that his profits will be greater; they would be larger even though the new departure did not bring the yield quite up to that of the old system. Of course there is a limit to the

increase of colonies that may be made on account of lessened labors resulting from the adoption of improved methods and fixtures, as the farther we advance in this direction the nearer and clearer looms up the spectral head of "Overstocking."

But it is a pleasure to note that the fixtures and methods of to day are superior even to those of half a dozen years ago. In this matter of sections and their management we have most emphatically discarded the plan of putting them on the hives and taking them off one at a time; a few bee-keepers still manipulate them by the wide frame full; but the majority of bee-keepers have adopted some sort of a case or super by means of which twenty-five or thirty sections can be handled at one time quicker than wink; and "tiering-up" may be practiced. The old, cumbersome, complicated, laborious side-storing system is, practically, laid upon the shelf. We feel like taking it for granted that "top-storing" and "tiering-up" with some kind of a case, crate or rack, furnish the best method now known for securing comb honey; that it is the only one that enables us to handle a "honey shower" with perfect ease, "rattling" the sections on and off the hives in a rapid, business-like way; and that about the only discussion needed is upon the merits and demerits of the different styles of sections and of the supers or cases in which they are used. It is true that "tiering-up" has been condemned, but principally upon the ground that the inability to contract the surplus apartment to less than a whole case results in a large number of unfinished sections at the end of the season. If this practice enables us to care for more bees, and it certainly does, and we thereby secure more *finished* honey in the aggregate, why grumble at the unfinished work thrown in?

For making sections, basswood is used probably to a greater extent than any other wood. It is the whitest readily obtainable in all parts of the country, while it possesses the elasticity needed in the one-piece section. Its faults are that it shrinks and swells badly, becomes mildewed and discolored very easily, and any honey accidentally dropped upon it soaks in and leaves a stain. White poplar is the best wood for sections. It is whiter than basswood, very hard, does not shrink or swell readily and is not stained by contact with honey or easily soiled by handling; but, unfortunately, it lacks the elasticity

necessary in one-piece sections. There is no handsomer nor better section than the four-piece, dovetailed, white poplar; and we believe the only valid objection ever brought against it is that more time is required to put it together. We are aware that we have been pleading for time saving fixtures, but we must make a distinction between the hurry and bustle of swarming time and the leisure of a winter's evening; or between the time of an experienced apiarist and that of some boy or girl who can put together sections. The objections to the one-piece sections are that they cannot be made of the most desirable wood and that they are made with "naughty" corners that gouge into the honey when crating it or removing it from the crate. Several manufacturers have told us that these undesirable corners can be left out, that cutter heads can be used that will leave an opening clear across, the same as it is in the four-piece section; but, for some reason, they don't make them so; we have yet to see a section so made. Just at present open-sided sections are a fit subject for discussion. We have never thought that they possessed any decided advantages over the ordinary closed-sided sections; but good men, with no mercenary motives, assert that they do; and, as a honey producer, we desire the section possessing the most advantages; as the editor of a bee journal, we ought to try and point out this section. The points of superiority claimed for the open-sided sections are that the greater accessibility of all parts induces the bees to enter more readily; to extend their work more regularly in all directions; to finish up more completely the end and corner sections, and that, too, nearly as soon as the center ones; to build straighter combs and to attach them more securely to the sections. It is claimed, still farther, that the air can circulate more freely through the sections, ripening the honey sooner and that larger yields are the result. We believe that the only real objection brought against this style of section, aside from the increased difficulty of removing the propolis, is that there are "naughty" corners upon the up-rights as well as upon the horizontals, and that these corners strike and catch in putting the sections into a super; in crating the honey and in removing it from the crate. The depressions in the up-rights also allow the combs to swing nearer together when slipping the sections down into the crates, thus increasing the danger of damaged

combs. In short, more time, care and patience are required in handling them.

Sections placed in wide frames, one tier of sections high, and used in a super, work all right; but we think this method is falling into disuse on account of increased expense and labor. If we do not wish to use separators nor open-sided sections, we know of no better style of case than the old, Heddon super. It is cheap, substantial and perfect. The T super allows the use of sections of varying widths, also of varying sizes in one direction, and with open sides or not just as we choose: separators may be used or not; the whole arrangement is cheap and simple, and the ease with which it may be emptied leaves no excuse for a side opening case.

This subject of sections and their adjustment on the hives is a broad one, and we have necessarily passed over many important points, but we think enough has been said to start the discussion; and correspondents are at liberty to introduce anything of importance bearing upon the subject.

EXTRACTED.

Dampness Not Injurious.

IN the October REVIEW we spoke of a man in Illinois who wintered his bees very successfully in a cellar where it would seem that the air was saturated with moisture. Below is a complete account of the matter as published nearly eight years ago in *Gleanings*.

I have a story to tell about wintering bees, and yet fear to tell it, on account of the criticism which I know, according to the books, and, in fact, according to all authorities on wintering, I richly deserve. Yet "All is well that ends well," and it may be that we have gone too far in preparing our winter quarters, etc. Now, I will make a plain statement of facts, and you, friend Root, and others, can deduct your own opinions.

During the summer of 1878, I purposed building a honey house, with a cellar under it for wintering my bees. During my leisure hours, I dug the cellar, and when the honey season closed, I was taken sick and the building of the house was abandoned. But, quite late, I put a frame of poles in it, and laid the sleepers across it with rails on them. The next step was to get the straw; but my team was in the cornfield, and no straw could be put on until the corn was all cribbed. So time passed. At last the corn was in, and the next day it commenced snowing, and we commenced hauling straw.

We had a good distance to haul it, and the result was a layer of straw and a layer of snow, until we had about two feet of snow and straw on, when it got so cold and bad that we quit. That evening I got some of my neighbors to help, and set my bees in the cellar, the combs being covered with frost, and the tops of the hives with snow, with snow in the cellar, everything being directly opposite to teachings. Well, the next three days were stingers, and I felt glad that the bees had escaped the severe freezing they would have received on their summer stands. On the fourth day it moderated a little, and we commenced to haul straw and it commenced snowing again, giving another layer of straw and snow alternating, until I had about four feet on, and quit.

Now I intended to set my bees out the first good weather that came, give them a flight, and then put them away according to the books; but no good weather came until the last of February, and they were put in the 7th of December. After they had been in a week or two, I picked up heart, and went in to see how they were getting along. When I opened the door, I was sicker than ever; drip, drip, drip, from over head, the bottom of the cellar all slimy mud, hives all dripping wet. Now, remember, I had over eighty stands of Italian bees in there, but not all the bees I had, for my lower apiary, as I call it, contained forty-seven stands and I had them put away according to the books, and I felt quite sure of them. Well, after looking around a little while, I found there were no dead bees on the ground, and nothing about the hives to indicate disease or death. So I closed the cellar, and came out of the rain into the cold. Another snow and cold spell followed, lasting until sometime in January, and I did not bother them for three weeks. When I went in again, the snow had about all thawed off the straw, and it being flat, of course the water ran through and down, over the bees. Remember it was the heat of the bees that melted the snow. I expected to find a sorry lot of bees. When I opened the door, I could just hear a faint hum, sufficient to let me know that there were some left to tell the tale; but, as the light of the lantern struck them, the humming sounded like the joyous song of a June day. Still, there was that drip, drip, from over-head, and the hives were all wet from top to bottom, but there was not a pint, all told, of dead bees on the floor. Now, here is the point I wish you to mark; at the entrance of each hive that I examined, the bees were out in regular circles, drinking the water that flowed down the hive on to the alighting board, as I set my hives in, bottom board and all, just as they stand in the apiary. After drawing a long breath, I felt better. I looked at them several times more during the winter, and found them always, in greater or less numbers, taking water. Well, the result was that I never saw bees come out in better condition in the spring; there was not a mouldy comb, not a case of dysentery, and, although set out the last of February, and before the last very cold spell, not a case of spring dwindling. Only two died, and they starved. The combs of the other hives were full of young bees with

plenty of bees to cover and protect them during the extreme cold that followed.

My lower apiary that was put away in good style, and kept dry, consumed one-half more honey, raised very little brood, and, with dysentery and spring dwindling, I got but little good of it this summer. All the honey I got was in the fore part of the season.

Now, friend Root, and brother bee-keepers, I have given you the whole story, and a long one it is too, but it may set you to thinking. The idea I have drawn from it is, that dysentery is caused by thirst. Bees confined a long time without water become thirsty; to relieve that thirst they consume honey; honey has more or less solid matter that cannot pass off by evaporation through the pores of the body, as water does, and the abdomen becomes distended and diseased. This is but theory; but, hereafter, if I have my bees in a dry cellar, I will keep a rag saturated with water at the entrance, all the time they are in winter quarters.

JAMES A. SIMPSON.

Alexis, Ill.

Protection Against Moisture.

ON PAGE 531 of the second volume of "Bees and Bee-Keeping" Mr. Frank Cheshire expresses his views in regard to the influence of moisture upon the wintering of bees. We think he has reference to their wintering in the open air, but the ideas expressed are equally applicable to in-door wintering. He says:

"Dampness is a great enemy to wintering bees. Prof. McLain noted the critical temperature to be less in a damp than a dry air, the reason being that water has an enormous capacity for heat (specific heat), whether in the liquid or vaporous form; the latter abstracts heat from the bees, and intensifies their struggle. The water produced by the honey is thrown off in vapor, because the cluster is warm. If the hive is thin, or the bees small in numbers, and, in consequence, distant from the sides, or if the top protection is scanty, the heated vapor is immediately deposited as dew, and the interior of the hive is wetted. When the sides are so non-conductive that the inner faces are not below the dew point of the interior air, the hive remains dry; and since wood conducts more freely than cork-dust, the inner lining should be as thin as notions of strength will allow. In gentle top ventilation, the heat of the cluster just beneath the roof keeps the part in contact with the bees both warm and free from damp, and the air passes off, carrying the moisture with it. The combs below are not mildewed, nor do they run with dew. If dampness appears at all, it is behind the runners, beneath the ears, where the temperature commonly falls to the lowest point; this, however, causes neither damage nor inconvenience."

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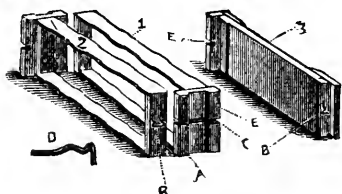
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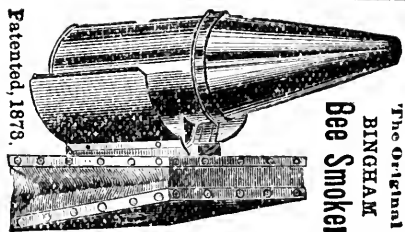
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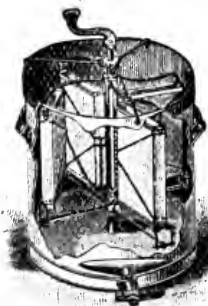
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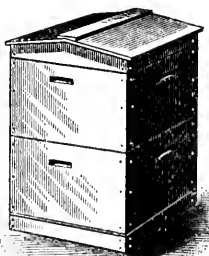
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THE BEE-KEEPERS' REVIEW

VOL. I.

FLINT, MICHIGAN, DECEMBER 10, 1888.

NO. 12.

A Brief History of the Review.

ONE YEAR ago, lacking a month, the gentleman whose portrait adorns (?) this page embarked in the publication of the BEE-KEEPERS' REVIEW. It was a rash undertaking. At least, most people would call it such; as the bulk of his capital consisted of the confidence and good will of his brother bee-keepers. The excellence of this capital, however, was shown by the fact that fifty bee-keepers subscribed before the first number was published; and when samples were sent out, subscriptions came pouring in at the rate of from fifteen to twenty per day. The skies were never brighter. There need be no more worry about the financial success of the REVIEW. Only keep up its standard of excellence, and all would be well. Then came sickness. First the little daughter; then her father. He lay in the big bed; by his side the little girl lay in her crib; while the wife and mother hung over them, and nursed them back to health. But the REVIEW? It was cut down as an untimely frost cuts down a tender plant. Bravely its editor went to

work; and, finally, tiny shoots, in the shape of subscribers, again began to appear. But the vigor of the parent plant was lacking. To drop the figurative, it became evident that the enthusiasm, with which the REVIEW was welcomed, had received a check—been

nipped in the bud—, and that the expense attending its publication must be curtailed or it could not live. Sleepless nights and anxious days were spent in thinking, thinking, thinking, endeavoring to decide upon the best plan of action. Only one course seemed open—the REVIEW must be “home-made.” There was a long talk with the printer, in which the facts were frankly and fairly stated. Very kindly he consented to give up the contract and to sell, upon easy terms, the type that had been bought new expressly to use on the REVIEW. Then the “front parlor” of the Hutchinson “mansion” was given up for an office.

A second-hand imposing stone and a paper cutter; as well as chases, rules, leads, galleys, etc., all really as good as new, were bought at about half-price of a man who got them on a mortgage. Some type cases and a rack were made, about twenty small fonts of new, display



*As ever yours,
W. J. Hutchinson.*

type purchased; and the gentleman mentioned in the opening lines of this history commenced another rash undertaking—that of attempting, without previous experience, to set up the type and make up the forms of a magazine. It was difficult and discouraging at first. Type that went to its place so quickly and neatly under professional fingers seemed to have become perfectly helpless—couldn't even stand alone. But there were no serious mishaps, while the work was really fascinating—had the novelty of newness. When an ad. came in, what pleasure it was to see how neatly it could be gotten up, how attractive it could be made to appear. Then the arrangement of the ads., and the other matter, in "making up," so that all should have a pleasing effect—all this was enjoyable. The wife and children became imbued with the spirit of enterprise. They addressed the wrappers, folded and stitched the papers, and wrapped them up for mailing—and—the life of the REVIEW was saved. Its subscription list climbed gradually up until it has now reached 887. This is not a large number, to be sure, but its beauty lies in the fact that none of these good people were either coaxed or hired to subscribe. They bought the REVIEW for the same reason that they would buy a pound of shingle nails or a sack of flour—for *itself*. Of such subscribers it can truthfully be said: once a subscriber, always a subscriber. The friends of the REVIEW will be glad to know that, even during this first year of its existence, it has brought in a little more money than it has cost; that, under its present method of management, its publication could be continued with a subscription list of only 1,000; that with 2,000 subscribers, a number that it will probably have within the next year, a snug little profit would be left in the pocket of its fortunate editor and proprietor.

The "Lateral," or Doolittle, Plan of Manipulating Sections. Some Evidence in its Favor.

T. S. SANFORD.

ALLOW me to add my testimony in favor of Bro. Doolittle's method of the lateral movement of surplus frames. I have been using this method largely for four or five years, and find it much superior to either side storing or tiering up. Especially is it valuable in a poor season, or when the honey flow is light, and it is less trouble than tiering up in our best honey flows. I use closed end frames,

holding four sections, with permanent wood-separators let into the end of the frames and nailed fast. These frames rest on strips one inch wide and a heavy quarter of an inch thick, and as long as the inside width of the hives, and placed over the ends of the brood frames; or they can be used on any honey-board having a bee space above. The side boards for these frames are $\frac{3}{8}$ in. thick, held together by spring and chain, or a piece of rubber cord will hold them tight enough. At the bottom of these side boards I tack a strip of enameled cloth, three or four inches wide, to cover the brood frames that may be exposed, when using only three or four surplus frames. By having extra frames filled with sections and starters, I think it is less trouble to open these supers, take out any frames that may be finished, move the other frames up together and place the new frames at the sides, than it is to fill an extra super, with 24 or 28 sections, and place it under the super on the hive. Besides, we don't know that we will really need any more room than what the super we raised up contained, if it had been well filled. There is not half as much fussing about this as there is in using two or three rows of sections in T supers and filling the vacant spaces with sides of sections. A sudden check in the honey flow, as we have had so much of the past two seasons, is liable to catch us with our almost filled supers raised and with empty ones under, when nine times out of ten the bees will take the honey out of the case above and carry it below. If we could have taken the finished sections out as they were filled, we could have had some filled sections, instead of a lot of partly filled ones. I vote for the lateral movement of surplus frames every time.

NEW CASTLE, PA.

Nov. 23, 1888.

Sections and Their Adjustment—A Criticism of Mr. Doolittle's Methods.

JAMES HEDDON.

AS I have said before, I invented the first sections I ever saw. I took my idea from the Lincham brood-chamber, adding a bottom piece. Of course, these sections were crude, holding about three pounds each, put together in clamps of eight, with glass on each side, held by spring wire, tight fitting tops, placed on the honey board and covered with the old style cap. Others were working on the same idea about the same time. Soon much better and smaller sections were brought out, and, for seven years, I experimented very carefully, and, as usual, on quite an extensive scale, until a few years ago I settled down upon the simplicity section, 4 $\frac{1}{4}$ x 1 $\frac{1}{4}$, only I made them just seven to the foot, open top and bottom; but not open at the sides. These sections are of white poplar, four-piece and notched at the corners. Since using these with the best of success, I have been open to conviction, and

watched for and studied for improvements, but, so far as I can see, nothing better than this is yet known to bee-keepers.

In regard to the style of storing case for adjusting these sections to the hive, I will say that where separators are not to be used, my old style of case, now known all over the world as the Heddon surplus case, is the best I know anything about. I do not believe that a single improvement can be made upon it in any way whatever. Any improvement that can be made in any direction will prove injurious to a greater degree than it is beneficial. When separators are desired, then this old style standard case is not the thing, because separators must be cut up, and complication at once created. I believe that the very best separator case is the one-story, wide frame with tin separator, under my patent. But this separator case has a serious objection. It is too costly, when desired in large quantities. Tin separators are costly as well as the case itself. The next best thing, something cheaper and lighter, is the T tin case, which I have used more or less for four or five years, it being first shown to me, and, so far as I know, invented by Mr. Vandervort, of foundation-mill fame. He has used it a dozen years or more. Now, to close the question of choice in surplus cases, my advice is, first, if no separators are to be used, my old style case: if separators are to be used, and not so many cases are to be made as to make their expense a serious matter, my new style of wide frame case, coming under my patent, would be the choice. If, however, large quantities are to be made, and economy in first outlay is a matter of considerable moment, I advise the use of the T tin case, in its simplest form. Sections should always run parallel with the brood-frames, for several reasons which I will not occupy space to give. A break-joint honey-board should always be used between the sections and the frames. The old time notion that the whole tier of sections should not be adjusted to the colony *at once*, because it gives too much surplus space to start on, is, in my mind, simply an old superstition, rapidly dying out. We have found an advantage in using small sections, because when the first surplus room was given, the *top* of that room was nearer the brood-chamber. With regard to tiering, I am not sure whether I invented or borrowed the system; but rather think I read about it somewhere, and at once catching on to its superiority over all other methods, adopted it the first year of my bee-keeping. By the way, while I write this, I remember distinctly that I got the idea from my father-in-law, Charles Hastings, even one year before I owned any bees. I remember distinctly of his tiering up 40 pound boxes, and remember so tiering such boxes the first year of my bee-keeping, 20 years ago. I have practiced the system ever since, with receptacles for both comb and, extracted honey. The advantages to be derived from the tiering system are so completely outlined in your introduction to the subject in last issue, that I feel there is nothing left for me to say. You very correctly remark that the extra time required

to put together the four-piece sections is of little moment, for a boy will make very satisfactory wages in putting them together at 50 cents a thousand. I had a boy who put together a thousand every eight hours, before he had spent more than two or three days at the business. The reason why the notched corner, whether a right angle or curved line corner, is always found upon the one-piece section is because, if the opening is cut clear through to the side piece, it is more apt to warp and break the small film of wood left to hold the sections together. That side piece gets a leverage upon it, as it were, when the humidity of the hive strikes the interior of the sections and the upright begins to warp. Basswood is most susceptible to the absorption of moisture which causes warping. The claim that the open-side section will induce the bees to begin work earlier I do not believe. I am very sure it is a fallacy in this location. My bees begin in the sections just the moment the nectar in the flowers admit of it, and they begin just as early with three honey-boards between sections and brood-chambers as with one, for I have made an extensive test and proven it. The acute angles created between the uprights by this opening in the sides will be the cause of gathering much glue, and would be an intolerable nuisance, it seems to me, when used in connection with separators. If used in connection with separators, the openings would be closed up by the divisions in my old style case, and if no such divisions are used, just think what a place for ants and glue to gather. I desire to go on record as saying that open-side sections will soon be things of the past. A side opening case will always work better in the imagination and in an illustration or the page of a bee paper than in actual use. More than a dozen of them have shot into the bee-keeping horizon, but they all winked out like little meteors, and so I believe they always will. I know pretty well who the practical honey producers are in this country. One who has read and written for journals and produced honey on a large scale for twenty years knows the difference, immediately, between a theoretical and practical writer. Such a one when reading an article, no matter how eloquently and skillfully written, will at once and correctly determine whether the writer has an apiary in his brain or in his back yard. I look with interest for articles on this subject from such men as R. L. Taylor and others I might mention, who ship their honey to market by the car-loads.

The article on the first page of *Gleanings* for Nov. 15th, page 855, is another one of Mr. Doolittle's fine-spun theories, which no one can afford to practice. He starts out with a wrong basis, which is that we should follow nature. We don't want nature's potatoes, nature's corn, nature's wheat, nature's chickens, cows nor horses; but we want much better ones, those which have come about as a result of man's intelligence opposing nature at the proper place and at the right time.

I would not be afraid to offer two

thousand dollars for good evidence that there is any system of working surplus receptacles which will get a more complete finish at the end of the season than will the tiering up method, that will not lose honey, or, in other words, reduce the surplus crop in an exact proportion. Sometimes bees will almost completely finish all their surplus work without any compressing in any manner, and then again they will leave lots of it unfinished, and even the compressing method will not finish it by a good ways, and this depends upon the temperature and honey flow outside of the hive. Do not forget this point: *Who is there that is known to be a practical dollars and cents honey-producer who is using Doolittle's method?* That is the point. You recollect that I put that to the Chicago convention and that busted the Doolittle man. Mr. D. talks as though he lived in the Arctic regions—all the time talking about "warmth, warmth, warmth." You know that I live *exactly* on parallel 42, and I never had one bit of trouble from low temperature, not even with my weakest stocks, at a time when there was one drop of surplus honey in the fields. I have been troubled with heat. I have had perfect success in getting sections finished when my style of supers are tiered four high. If Doolittle's system would work a bit, somebody would have been making his hives and offering them. He has not anything that he can sell to the public or that any one else cares to make and sell.

DOWAGIAC, MICH.

Nov. 19, 1888.

Heddon Case, Wide Frames and T Supers. the Last-Named Preferable.

DR. C. C. MILLER.

I HAVE heard men say they were satisfied with their arrangements for taking surplus honey and wanted nothing better. I have never had anything with which I was entirely satisfied, and never expect to have. None the less, I think I can tell something about the advantages and disadvantages of different sections and supers. At present I am using T supers and one-piece, $4\frac{1}{4} \times 4\frac{1}{4} \times 1$ 15-16, sections, which is equivalent to saying that in the present state of my knowledge I know of nothing better. I have used, previous to using the T supers, 6 lb. boxes on box hives, also on frame hives, wide frames, and Heddon supers, giving each a thorough trial, and to a less extent two or three other kinds of surplus arrangements. If I were like some, merely keeping a few colonies for the pleasure of it, and cared nothing for the amount of labor as compared with the amount of surplus, I am not sure but I would use wide frames. But as I am trying to make the most money for my time and labor, I can't afford wide frames. In their defense, however, I may mention that the difficulty of getting sections out of them has been overrated. A certain W. Z. H., in many respects a very decent kind of a man, once said, if I remember rightly, that he

could empty a Heddon super while he was getting the first section out of a wide frame. Quite true, probably; but it only showed he didn't know how to empty wide frames, for the first section should never be taken from a wide frame, but the whole eight at once; and I think I can take 1,000 sections out of wide frames in less time than out of Heddon supers. Still, if I did not want to use separators, I would rather use Heddon supers than wide frames, on account of less labor in manipulation. Even without separators, I much prefer the T super to the Heddon, on account of greater ease and safety in taking out sections, particularly if the sections are allowed to remain in the supers till the weather becomes cool.

In your editorial, Bro. Hutchinson, you speak of "the inability to contract the surplus apartment to less than a whole case" in tiering up. Let me take issue with you. Any number of sections from one to 24 may be put in a T super. It is some trouble, and I doubt if it would be desirable to put in fractional parts of rows across, but I have during the past season used a number of supers in which each super contained a single row, or six sections, and others containing 12 sections, the full super containing 24 sections. These partly filled supers work satisfactorily—as satisfactorily, I think, as any other system, with or without tiering up. So long as I use T supers, I presume I shall each year use some partly filled. All that is necessary is to put in place of an omitted row a thin board in the bottom, or some pieces of sections.

As to width of sections, I have used in considerable numbers five different widths, measuring 6, 7, 8, 9 and 10 to the foot. On the whole I found no advantage in having any other than the ordinary 2-inch. or, to be exact, 1 15-16 inch.

When I first heard of side openings to sections I whittled them out in about 100 sections. So far as I could judge from so limited a trial, I could see no advantage in them. We are apt to become enthusiastic over new things, especially those of "our own git up," and I have thought that the advocates of open sides were just a little too extravagant in their claims. The claim that "the greater accessibility to all parts induces the bees to enter more readily" I doubt. I have no difficulty in getting my bees to commence work in sections as soon as I want them to, and I wouldn't give a cent, I think, to have them commence any sooner than they do. Give them a single section (somewhere near the center of the super), out of which honey has been emptied, and there is no trouble about their beginning as soon as I want them to. Considerable stress is laid upon the point that a bee can save a good deal of travel by going across from one section to another, instead of going around. What does she want to go across for, or around, either? If she has a load to deposit in a section she would better go straight up, transact her business, and then go straight down again, without wasting time in unnecessary travel crosswise. I think bees may be a little more inclined to extend their work side-wise, if there is

ready access in that direction, and this may count for something when the super is not crowded full of bees. I have seen open bee-ways with very straight combs well secured to the sides, and I have seen just as straight and just as well-secured work with closed sides; and I have seen bulgy work with open as well as closed sides.

I changed from four-piece to one-piece sections regretfully. The one-piece give more trouble by being out of square. There is trouble about breaking at the corners. They have the "naughty" corner, but they are more rapidly put together, and I changed pretty largely, because I wanted to follow the crowd. I don't believe in following the crowd always, especially in morals and politics; but as far as possible I think it is better to use what is nearest a standard article in the way of supplies. I like two-piece sections well.

MARENGO, ILL.

Nov. 19, 1888.

The Heddon Case—Wide Frames—Putting on Sections—They Must be Handled by the Case.

R. L. TAYLOR.

FOR my markets and methods I have no hesitation in saying that, as respects size, the $4\frac{1}{4} \times 4\frac{1}{4} \times 7$ to the foot, section is the best. In markets with which I am acquainted it is never, so far as size is considered, placed second to any other; and is well adapted for use either with or without separators.

As to the preferable pattern, I favor the four-piece section. I have never seen a one-piece section that I desired to use. It is said that four-piece sections, after they are put together, get out of shape with handling; but one-piece sections will draw out of shape without handling. I have never tried a make of which a considerable per cent. would not work out of shape in a Heddon case or in a T super. It appears also that the "naughty" corners cannot well be obviated, and it is an objection, not only because it is liable to break the comb in the next section in crating, but also because it contracts the openings for the bees through the case. I think the sections are better filled when the openings extend entirely across them. In the four-piece section the top and bottom pieces should be fully $\frac{3}{8}$ inch narrower than the sides.

As between white poplar and basswood, the former is much the better wood for sections: it is whiter, keeps its color very much better, is harder, and shows little sensitiveness to moisture, while the latter stains easily, responds quickly and excessively to moisture and drought, and on account of this characteristic, as well as its softness, the notched corners do not hold well. Poplar sections, unless poorly made, if put together with a "former," as they should be, are sufficiently firm.

Of all the cases in use, if separators are not to be used, the "Heddon" is unquestionably the best.

It is cheaply made, and is in every way convenient. As between this case and the case with single tier wide frames, I am in doubt. The first cost of the former is very much less, the same number of sections filled in this will be found to contain about ten per cent. more honey than if filled in the other, but it takes longer to clean the sections, and then they will not look so well as those filled in wide frames, and though with me there is no trouble in packing the honey, it requires a little more time and care to do it, and the honey is not quite so smooth and fine in appearance, nor are the sections so nearly equal in weight. On the other hand, if the wide frames are properly made, the sections with little cleaning are as bright on all sides as when they were put upon the hive; and, for some reason which I have as yet not been able to divine, they are more nearly filled with honey than any sections I have been able to get in any other way: that is, I mean there is less vacant space around the inside of the sections—of course, the combs are not so thick. The whole time required for manipulating the sections in each of the two kinds of cases from the beginning to and including the packing of the honey is, I think, about equal. For the present, at least, I want both kinds. I am trying a modified T super, but I am not yet prepared to speak approvingly of it.

Whatever the kind of cases and sections used, when the honey season is at hand, there should be a sufficient number ready to supply the colonies with all needed room for storing their surplus. When the honey flow is fairly begun, I am on the lookout for colonies that are in condition for working in the sections. The honey boards are already adjusted, and it is inconvenient to look for bits of new comb on the tops of the brood-frames. Indeed, that is quite unnecessary, and withal a poor criterion of the condition of the colony for working in the surplus department. I simply raise the cover, and if the upper side of the honey-board is well covered over with bees, a case of sections goes on so quickly that the latter do not have time to take wing. Other cases are then added as room is required. To properly determine this point some skill and experience is required. The strength of the colony, the stage of the honey season, and the liberality of the honey flow, are all to be considered. With strong colonies in the early part of the season, when honey is coming freely, space should be given generously, and, under these conditions, when a case is about one-quarter full of honey, the corner sections being filled about equally with the center ones, a new case is given by placing it on the hive under the case already on. Less and less space should be given as the above conditions become less favorable, only the case must always be taken as the unit. We cannot afford to handle, in the bee yard, sections, wide frames, or fractions of cases.

To work to advantage, bees need elbow room, and it is only necessary that they should have so much; but as we cannot watch each hive continually, and as thousands of young bees are being added to the

colony daily, it is better to anticipate somewhat their needs in this direction. In doing this the cases are sometimes tiered up four and five high, as I prefer not to remove the honey till towards the close of the current honey flow.

LAPEER, MICH.

Nov. 29, 1888.

Sections and Supers—What Kind Shall We Use ?

OLIVER FOSTER.

SURELY no more seasonable subject could be discussed in December. The REVIEW is to be commended, not only for its choice of special topics, but for its tact in arousing its contributors to a lively discussion of those topics.

I discovered long ago that the most effectual way to stir up a man was to tread on his corns; but the practical application of discovery is left to art and science.

When in a November editorial we see some of our pet "corns" assailed in the stirring-up process, who wouldn't accept of a kind and generous invitation to "kick back."

After using many thousands of both the four-piece and the one-piece sections, I most decidedly prefer the latter. They are cheaper and more rapidly put up, but the most important point in their favor is their *strength*. One dovetailed corner to a section is all that I can tolerate, and I often long for some easy way to nail that corner. If in rapid handling, we strike a four-piece section at one corner, it is easily knocked out of square. If it contains a full sheet of foundation, it is injured; if honey, it is spoiled.

In tiering up by the case-full we get many combs not firmly attached, especially at the bottom. In shipping, it is best to place this side up. The retailer will lift it by this piece, and if it is dovetailed, it will probably come off.

It is claimed that white poplar is best for sections, because it will not shrink as much as basswood, is whiter, etc. Now, the shrinkage of sections is a serious objection only where a super is used that is not adjustable to shrinkage. As for whiteness, why have sections so white? The honey does not look so white in them. I have for four years stained my shipping and retailing cases with asphaltum—almost black. The honey appears enough whiter and nicer to pay for staining, and my package has received many words of praise.

For my own use I would prefer sections made of some uniformly brown wood, such as red elm or yellow poplar, I think it is. I refer to the wood berry-boxes are made of. Either of these woods is tough enough for one-piece sections. Propolis stains would not show on such sections and the honey would look whiter.

Having elsewhere discussed the theoretical advantages of open-side sections, I will simply say that I have used them extensively and almost exclusively for four or five years,

and shall continue to do so, believing, as I do, that I can get the honey stored in them more promptly and rapidly, and with less contraction and tinkering with brood-chambers. Last spring, as an experiment, I filled four cases with open-side and closed-side sections—14 of each in each case. I placed all the open-sides together on one side of the case and the closed-sides on the other, making $3\frac{1}{2}$ rows of each, lengthwise of the case or super. I put foundation starters in all alike, about $1\frac{1}{2}$ inches wide. I placed one of these cases on each of four colonies, carefully arranging the center of the brood-nest under the center of the super. Work was commenced in all near the center of the case, but always in the open-side sections. When the supers were about $\frac{3}{4}$ filled, perhaps $\frac{2}{3}$ of the honey was in the open-side sections. The closed-side sections in the corners were always finished last, and when the supers were removed, among these were the only unfinished combs.

It has been reported that the bees sometimes build combs through the open sides. I have given this matter a thorough test this season with wide side openings, crowding the bees until they built comb and stored honey in the 5-16 horizontal bee spaces between the supers, but I have never yet seen combs connected through these vertical side openings. Why should we expect it otherwise? The side openings are simply a continuation of the natural space between the combs.

I would advise caution in adopting open-side sections. Those who propose using them in a super of fixed size, in which they can "rattle around," will probably decide against them, as some have done. They certainly will, if it is the T super in which they are tried. I thought this point was apparent to all, until I noticed it overlooked in the November editorial.

The difficulty arises from the fact that the upright folds of the T tins separate the rows of sections, causing three narrow spaces, which extend from side to side of the super and from the T tins to the top of the sections. Now, these spaces do no great harm, unless the bees have access to them, but where they do, they plug them full of propolis, soiling the sections and making extra work. With closed-side sections their only access to these spaces is at the upper corners of the sections, and by using an extra set of T tins in these openings at the top, all access to the spaces is shut off. But not so with open-side sections, for with these in T supers, the bees have access to these narrow spaces all around every side opening and no chance to shut them off.

This difficulty is also met to some extent in all other supers of a fixed length, as they must be enough longer than the tier of sections to allow of easy manipulation. A little consideration of this point will reveal one advantage of a case that is adjustable in length as well as width. Perhaps those who object to the open sides because of the so-called naughty corners, have not yet learned how to manage them. We make all our shipping and retailing cases fully $\frac{1}{4}$ inch wider than the tier of sections, and they can

be filled and emptied as rapidly and as safely with open-side sections as with the others. The cover board holds the sections from jostling.

With regard to supers, I am too modest (?) to say which one I prefer. I will simply say that the leading feature of the one I use is its adjustability in size from $\frac{1}{4}$ inch longer and wider than the tier of sections it contains to $\frac{1}{4}$ inch shorter and narrower, by which function the sections can be pressed tight together both ways, even if they swell or shrink, as they always do.

Aside from the unequalled ease in filling and emptying this super, the sections are removed with the least possible injury to the combs. The brace combs, which often connect the outside combs with the sides of the case, are pulled loose laterally, whereas they would scrape or roll along over the surface of the comb while crowding them out of a super of fixed size.

MT. VERNON, IOWA.

Nov. 26, 1888.

Sections and Section Supers.

DR. G. L. TINKER.

BEE-KEEPERS are steadily approaching a standard section honey box—the one-pound. The tendency is also to a uniform size, the $4\frac{1}{4} \times 4\frac{1}{4}$, and also to a uniform width, the 1". Such a section, having open sides, and used with separators, will average one pound in weight.

It appears to be well settled that as much comb honey can be secured in the one-pound package as in any larger size, and since the one-pound is the most popular in the markets, it is likely to become a standard, as all other sizes of sections are gradually, but surely, going out of use. This fact is shown by the steady and increasing demand of supply dealers for the one-pound packages.

It is well known that the linn or basswood is the only white timber from which one-piece sections can be made. It is also largely in use for this purpose, which is the more unfortunate, as the basswood is one of the best sources of honey for our bees. It is not an exaggeration to say that when this tree as it now stands in the large forests is destroyed that the production of honey will become unprofitable, unless artificial pasturage can take its place, which is doubtful. The rapid and increasing destruction of the basswood is already causing serious apprehension in the minds of many of our best bee-keepers. Mr. H. R. Boardman, whose foresight and ability none will question, stated to the writer not long since that the basswood in his locality was rapidly being cut down and used for sections. It was a question of only a few years when this source of nectar for his bees would be destroyed, when he doubted if bee-keeping would not cease to be profitable. And I find that this same estimate of the value of the basswood to bee-keepers is held by many others.

At the present time bee-keepers are the largest consumers of the basswood, and every man who uses the one-piece section is

encouraging its further destruction. It seems to me that such bee-keepers are standing in the way of their own future success, when self-interest should discourage, as far as possible, the cutting down of basswood timber. Bee-keepers should guard with jealous care the trees yet standing in their localities, and in many instances valuable trees may be spared with proper effort.

If the one-piece section had any great advantage over the four-piece dovetailed section, in the way of obtaining a larger surplus, there might be some justification for its use, but no such advantage exists. The only advantage claimed is that the one-piece can be put together a little quicker than the four-piece. But it often happens that, owing to many breakages, the four-piece section can be put together the most rapidly. Certain it is, that the saving of time in putting together the one-piece section is not a serious item, when a few boys at 25 cents a day can put together, for a small outlay and in short order, more four-piece sections than any of our largest bee-keepers can use. I always employ small boys to put my sections together, and they like no better fun.

But the one-piece section is always a frail affair, and it is next to impossible to make them true. On the contrary, the four-piece, if properly made, is much the stronger, and it is easily made perfectly true, both in size and width. Again, unless the former are securely clamped in the super, they will speedily assume a diamond shape and become both unsightly and difficult to crate.

Lastly, the white poplar makes the most beautiful section. It is a whiter wood and not so easily soiled as the basswood. Owing to its being a very brittle wood it cannot be made into the one-piece sections. It must be made either dovetailed or to nail. As the white poplar is worth almost nothing for any other purpose, and makes the best section by far that is made, it is a marvel to me why any bee-keepers should use the one-piece section.

There is another timber, the *white gum*, growing extensively in this country, that makes a nicer section than the white poplar, but it is more difficult to work. The wood is heavy and very fine grained, taking a high polish from a properly fitted circular saw. Some of it is almost as hard as white hickory, but for that matter I can make beautiful sections from the hardest white hickory. Some of the gum trees are brash and soft, and I am sure can be worked as easily as the white poplar. The white gum makes the best and nicest shipping crate that is made. It holds a nail securely and is less inclined to split than the white poplar.

For years I have sought a section or surplus arrangement by which as much comb honey could be secured as by the use of brood frames in the supers. At last I can say to bee-keepers, I have found it. It is the use of the open side sections. At last it can truly be said that no loss in comb honey is occasioned by the use of a small package, if so constructed as to favor the work of the bees. And only by providing the freest

communications to all parts of a section super can this be done. Numerous closed partitions in a super are so many barriers to the work of the bees, and will ever result in a diminished product. An item of the highest importance in the construction of a super is to provide free ventilation from end to end and side to side. The nectar brought in by the bees usually comes with a rush, and it is fully one-half water, which must be evaporated. It is carried at once to the rapidly growing combs of the sections, and if a draft cannot be easily made through all parts of the super, the ripening of the honey must go on slowly and by increased and protracted labor of the bees. No wonder they often get discouraged in working in the old style of closed side sections, and often hesitate to make a start in them. This one advantage will many times offset any alleged advantage in handling closed side sections. But the open side section has numerous other advantages over the closed sided. The edges of the combs are built out even all around and the section is perfectly filled. The closed side section is rarely built out square to the uprights of the section, even in a good honey flow, but the bees are apt to leave a bee-space between the uprights and the edge of the combs, except a thin attachment in the center. With the open side section the bees always build the edges of the combs straight out to the uprights, and as a result put more honey in them than in the same sized closed side section. Hence it is that an open side section, $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{3}{8}$, will weigh on an average as much as a closed side section $4\frac{1}{4} \times 4\frac{1}{4} \times 2$. Again, with closed side sections, it is seldom that the sections at the ends and sides of the super are filled out as perfectly as the central ones. But the open side sections fully and completely overcome this objection. The end sections will be filled out as perfectly as any others, and no one-sided combs are built.

In a moderate honey flow the bees take the central rows of sections first and follow the separators, the central end sections being completed about the same time that the center sections are: the sections at the side of the case being the last to be completed, the tendency being to complete all sections in which work is begun.

After years of experience in the endeavor to succeed in obtaining well built combs in sections without separators, I gave it up, and I have resorted to every known expedient. I prefer wood separators, sawed 1-16 thick, and if made as wide as the section is high, they give most excellent results. In the use of a section $1\frac{3}{8}$ wide this requires that the top and bottom bars should be only $1\frac{3}{8}$ of an inch wide, thus securing a passageway $\frac{1}{4}$ inch wide each side of the separators. I also wish the separators perforated opposite the openings in the side of the sections. For this purpose a $\frac{7}{8}$ augur hole answers every need, and is never filled up with brace combs. With sections and separators so constructed every section has 12 openings into it for the passage of the bees and for allowing free ventilation.

However the super may be constructed

otherwise, the above points are first essentials, as they are requisite to the successful working of the bees. In all other respects, a super should suit the convenience of the bee-keeper for ease and rapidity of operation. For this purpose I have found nothing better than wide frames, one tier high, properly supported in a case. This requires also that the side of the super be removable, and retained in place by an adjustable hook at each end of the case. The most practicable device of this kind that I have used is the invention of Mr. H. D. Cutting.

That the wide frames may be made light and yet not sag with the weight of honey in the sections, I place a bar or post in the center of each frame, so that both the top and bottom bars of the frame aid in supporting the sections. So constructed, the top and bottom bars require to be only 3-16 thick and $1\frac{3}{8}$ wide. Such frames are cheap and afford every desirable facility in handling four sections at once and the removal of sections as fast as completed. The separators are not made fast to these frames, so that it is an easy matter to shake the bees off from a frame of sections, and the center bar prevents any liability of the sections being thrown out of the frames from shaking them. I leave the sections in the frames until ready to crate them for the market. They are then easily forced out of the frames by placing a block the size of two sections beneath and pressing the frames down.

The principal objection I have to the T super is that the whole case must be left on the hive till all the sections are completed, for only one section can be handled at a time, and that with great liability of injuring the combs, even by the most careful. But it is not practical to take off one section at a time in a large apiary, so that all the sections must be left on till all are completed, and when, as is often the case, the honey comes in slowly the center sections are liable to be soiled by being travel stained when left on too long. Besides if the tops and bottom bars of the sections are exposed they will be more or less soiled.

Again, the T super cannot be made to work right with the open side section and wood separators as above described. It is admitted that it works fairly well and is very cheap for holding the closed side sections.

As more T supers would be required to run an apiary than of the wide frame supers, the claim is made that although a little cheaper than the latter, the cost of the number required for an apiary is about the same, with all the advantage of facility of operation on the side of the wide frame super. I may add that after a trial of a great many kinds of section supers, I have found none that give the perfect satisfaction of the wide frame super.

The advantage of storifying supers is fully recognized, and no super is perfect that does not admit of being raised up and an empty one placed beneath it thus permitting the use of as many sections on a hive as may be desired.

Bee Conventions.

MAHALA B. CHADDOCK.

PROFESSOR Cook says, at the close of a most excellent letter in behalf of the American Bee-keepers' Association: "I have spoken; who will speak next?"

In answer, I say "I will." I am of the opinion that it does *not* pay to attend these conventions—unless one has an ax to grind. Professor Cook ought to go; it will pay him to do so. Mr. Hutchinson, Heddon and Root all have something to go for. Mrs. L. Harrison gets better pay for what she writes because she attends the conventions. Dr. A. B. Mason can sell his recipes for preserving eggs. The Dadants can talk about their most excellent foundation. D. A. Jones ought to be there to keep up with the times. This applies to the editors of all the bee journals; but for the common bee-keepers, like myself, it will not pay.

It is too small an affair to get cheap rates on railroads. To make it popular it ought to be tacked on to some big affair like the soldiers' re-union. Now, if the bee-keepers' convention had been at Columbus at the time that the G. A. R. men went there on that excursion, I could have gone there and back for six dollars and fifty cents. Nearly all our neighbors went and that was all the fare they had to pay. I know I should try it, anyway. Now, next year, won't somebody try to have the convention attached to some big affair—like a buttonhole bouquet on a fat man—and then we will get excursion rates, and everybody can go. But, if I *ever* do get money enough to go to one of their conventions, I hope none of the members will remember anything about "axes to grind," nor lay anything that I have said up against me.

VERMONT, ILL.

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"PRACTICAL BEE-KEEPING."

Mr. D. A. Jones is writing some papers upon "Practical Bee-Keeping." They are being published in his paper, the C. B. J. We expect to have room to review them in the next issue. As their author is a practical apiarist, something "practical" may be expected.

TWENTY PAGES.

To make room for the comprehensive index, also for the increased amount of advertising that appears in this issue, we have added four extra pages, making twenty in all.

SENDING PAPERS AFTER THE SUBSCRIPTION HAS EXPIRED.

One man, in sending in his subscription, said: "You may send me the REVIEW one year, upon this condition: that you will stop it when the time is out." Good. This is a man after our own heart. This putting of a paper into a man's pocket, or the next thing to it, a paper that he has not ordered at that, and then in a few months turning around and asking him to pay for it; then, if he doesn't respond to the "dun," threatening to sue him; following this up, perhaps, by publishing an undignified "whine" about delinquent subscribers—all this is not only very unpleasant and unbusiness-like but *unjust*. We know editors offer all kinds of excuses for this sort of thing; but we believe that the true reason has never been published: we are led to believe that the secret spring moving them to such action is the fear that many of their subscribers do not think enough of the paper to renew, and it is the desire of the editors to force their papers upon such subscribers just as long as possible. We shall promptly stop the REVIEW when subscriptions expire. Upon the wrapper of the last number will be stamped: "Your subscription expires with this number;" and if there is anyone who does not care enough for the REVIEW to renew—why, we shall be sorry, and that is the best we can do.

QUEEN BREEDERS' JOURNAL.

In these latter days we are getting specially down pretty fine. We now even have a journal devoted especially to queen rearing. "Vol. I. No. 1." of the *Queen Breeders' Journal*, looking bright and fresh, lies upon our desk. It is the same in price and size as the REVIEW, but the type is larger and all the matter leaded, and this first issue is really creditable, both in appearance and contents. Our only fear is that there are not enough queen breeders to support a journal devoted especially to their calling; but then, a large

share of bee-keepers are more or less interested in queen rearing, and perhaps there will be enough of them subscribe, in addition to the queen breeders, so that the Q. B. J. can make a "live" of it. We hope so, as this first issue shows that it is deserving of success. With pleasure we welcome it to our exchange list.

In his introductory the editor says: "The industry of apiculture has crystalized itself into three distinct classes, viz.—Honey production, supply manufacturing and queen rearing. We believe the last named branch deserves more attention than has been given it in the past. We shall do all in our power to promote its best interests, and bend our energies to inspire the American breeders to the successful production of the best queens in the world."

"EXTRACTED."

We had hoped to give, in our "Extracted" department, the views of Messrs. Miller and Doolittle upon our special topic, as they appear in the last two numbers of *Gleanings*; but our own correspondents needed so much elbow room this month that the "Extracted" department was crowded out altogether. As most of the readers of the *REVIEW* are, quite likely, also subscribers to *Gleanings*, and, as these articles have appeared so recently, it is, perhaps, just as well as it is.

HOW TO MARK SHIPPING CASES WITH A STENCIL.

In the opposite column we have a little to say about having sections and crates neat and tidy; about wrapping them with paper that they may reach the markets in a clean condition. There is one more little item in this line that it might be well to mention; and that is the use of a stencil in marking the cases for shipment. Very seldom do we see a neat job in this line. The blacking gets under the plate, giving the letters a blurred appearance. Then the brush slips over the edge of the plate and daubs the fingers and wood. For holding the plate in position we have always used a little wooden frame a trifle smaller than the outside of the plate. This firmly holds the plate so that it cannot move about; also protects the fingers and wood from the brush. We have always used a brush having very short, stiff bristles. Lately, our brother wished to mark some

crates; failing to find the brush, he wrapped a piece of an old woolen stocking around the end of a stick, tying it securely, thus forming a swab. With this for a brush the lettering was simply perfect—just as neat as print. The pressure of the swab held the plate firmly against the wood, while its porosity enabled it to absorb, and yet give out in the right proportion, the mixture of lamp-black and kerosene. Thirty crates were marked with once dipping the swab in the blacking.

THE BEST KIND OF SECTIONS, AND THEIR MANIPULATION.

It is evident that those bee-keepers who are not satisfied with the four-piece, white poplar sections have never used any that are first-class. They must be made of well seasoned timber, dovetailed so that they must be *driven* together, either with a mallet or a former. Such sections as these are faultless. They are not knocked out of shape even by rough handling; neither do the top-bars come off when the honey is lifted from a case. Most strenuously do we object to the use of dark wood for sections or shipping crates, or to the painting, or even staining, of the cases for holding honey. We have seen sections of a dirty-brown, colored wood, also of black walnut; have seen cases or crates stained, painted, and even varnished, and to us they seemed failures. Let the honey and its surroundings be neat, clean and white—beautiful in their simplicity. To daub on paint or asphaltum varnish seems a desecration. It is asserted that dark sections and cases make the honey appear whiter by contrast. Possibly; but the contrast is not a pleasing one. To make a comparison: it is like a colored oil-cloth spread, for a dining table, instead of the "snowy linen." Honey, in its virgin purity, is a beautiful luxury. We know not with what to compare it, unless it be a sweet young girl; and we think robes of white are the most becoming for either. That the beautiful white shipping cases may reach the market unsoiled, we have wrapped them with paper. You may smile if you like, but the purer, cleaner, sweeter and more delicately neat appear our delicious combs of honey, the more tempting are they to the man who is conducting a debate between his pocket-book and the desire to brighten the eyes and gratify the appetites of wife and

children. But very little evidence appears *against* the open-side sections. Some think them no better; while others are loud in their praise. Last month we gave Dr. Miller a playful "dig," because he was so slow in thinking of how it was possible to contract the surplus room in a T super or in a Heddon case. Now we are obliged to plead guilty to a greater amount of thick-headedness. Until reading the excellent article of friend Foster's, that appears in this issue, it never occurred to us that the T super was not just the thing in which to use open-side sections. The upright portions of the T tins separate the rows of sections, and the side openings allow the bees access to these cracks, which are, of course, filled with propolis. With wide frames, or particularly with the Foster case, this difficulty does not appear. Wide frames, one tier of sections high, receive a warmer support than we really supposed they would. There is certainly no better method of using *tin* separators than by nailing them to wide frames; while, so far as results are concerned, the wide frame system is perfection. The objections to wide frames are their cost, and a little more labor in manipulating. In their favor it may be said that they afford the most convenient method of contracting the surplus room to a less capacity than a whole case of sections: while, if placed in a case, they may be handled a case full at a time. And we must say that our friend Taylor is decidedly in the right when he says that, in the apiary, we can afford to handle sections only by the case full. That the proportion of unfinished work may be diminished by a careful gauging of the surplus room near the close of the honey harvest is undoubtedly true; but, simply for the sake of this advantage, we cannot afford to adopt fixtures that will be a hinderance during the height of the harvest. At present the apicultural finger is pointed at pound sections; top-storing; tiering-up; and some sort of a case. Whether wide frames will stay in the case is doubtful: *we* think they will drop out.

Since the above was in type, and after the matter for this number was all set up, in came a long article from Mr. H. R. Boardman. We are the more sorry that it cannot appear in this issue, as it is a most excellent defense of the use of wide frames in full hives. Fortunately, it is of such a nature that it will "keep," and our readers may look for it in the January Review.

BEE HIVES.

We are going to do something courageous. Listen. The Jan. REVIEW is to discuss "Bee-Hives." This will be almost equal to discussing a lot of babies in the presence of their mothers. The man who could engage in such a discussion, do justice to the subject and to the babies, and come off with flying colors, would be awarded the prond title of "a genius." It would require more than genius to conduct such a discussion harmoniously. Tact would be needed; and a review and analysis of the principles of beauty, sweetness and cuteness, as applied to babyhood—the work so neatly done, so pat, that all listeners would, unconsciously, arrive at a unanimous decision—this would be a most magnificent piece of skill and tact. How much more diplomatic than saying that Mrs. Healthy has the most handsome baby. It is in this manner that we propose to carry on the debate upon "Bee-Hives"—discuss principles instead of individual hives. It may not be possible to adhere strictly to this rule, but we consider it desirable. The stronger the arguments, the warmer their welcome; but all must be courteous.

In "Bees and Bee-Keeping," under the head of "Hives for Bees," Mr. Frank Cheshire shows that external protection is essential: that, lacking this, a crust or envelope of closely clinging bees must be formed upon the outside of the cluster, thus forming a living hive, inside of which it is possible to maintain a temperature of 95°. This envelope or crust would vary in thickness according to the temperature. Upon our hottest days it would break up altogether. By furnishing the bees with an outer covering the workers composing the "living hive" are released for other labors; but if the hive is too large the bees cluster at one side or corner, thus leaving one side of the cluster exposed, over which must be formed a protecting crust of bees. Mr. Cheshire says: "It is true that hives gather no honey, but in so far as they effect the objects which have engaged our attention, they are the cause of much being gathered."

These remarks of Mr. Cheshire naturally introduce the question of the *size* of hives. That it should be adapted to the size of the colony, the season, etc., is admitted by all; but the question of how the capacity of a hive shall be changed ought to lead to a

lively debate. If the combs are very deep it is impractical to contract or enlarge the brood-nest, except laterally, and by the aid of division boards: but this method allows of a most complete control of the degree of contraction. Changing the size of the brood-nest vertically is practical only with shallow combs: and the shallower the combs the more perfectly can this method of contraction and expansion be managed. As bees strive to put their work in a globular form, with the honey at the top and the brood at the bottom, it is evident that the brood-nest ought to be more shallow than broad. For awhile before swarming-time a large brood-nest is needed: larger, at least, than is needed after the main honey harvest has come. We do not wish to discuss in this issue the contraction of the brood-nest, except as it has a bearing upon the hive question. That is, what style of hive will enable us to practice contraction to the best advantage. As top-storing and tiering-up are now almost universally practiced, and as bees usually work much more readily in sections that are over the brood, it is evident that a hive allowing vertical contraction is the one for the "contractionists" to use. If contraction is not to be practiced, then there arises the question of what size shall be the brood nest. Some plead for generous space, that the queens may not be cramped for room, as though this condition of affairs were very undesirable and unprofitable. Were queens expensive, this plea would be worth consideration: but, as the capital is in the combs, honey and hives, rather than in the queens, the question as to which should be kept employed at the expense of the other's idleness, needs no argument. If the size of the brood-nest is to remain unchanged, then let it be of such capacity that an ordinarily prolific queen will fill it at the height of the breeding season. Let the size be less than this, rather than more. Eight Langstroth combs, or their equal, will furnish sufficient room.

Aside from a small brood-nest, to secure a more complete filling of the combs with brood, or to lead to more rapid work in the sections, there be mentioned the making of hives in such a manner that they may be inverted. The masses have not seemed to take kindly to inversion. Like many new things, it has been extravagantly praised: but it is far from valueless, and well worthy of notice in the discussion. With a hive

having a horizontally divisible brood-chamber, the interchange of the parts accomplishes the same results as inversion.

In northern climates bees need more protection in winter than is afforded by single wall hives. In the latitude of Michigan this is best afforded by a cellar: farther south some kind of packing is probably preferable. Whether this packing shall be in the shape of the so-called chaff hives, or in something of a temporary nature that can be removed in the spring, is another debatable point. We know that temporary packing calls for a little extra labor, some untidiness, and a somewhat unsightly appearance in the apiary during the winter: but it is cheaper than chaff hives, while the advantage of having light, single-walled hives during the working season, hives that can be picked up, handled, manipulated, tiered-up, carried, if necessary, to a distant but more desirable location—hives, in short, that can be handled in a way that means *business*—all these advantages are so great that we should never think of adopting the chaff hive.

Speaking of the greater ease with which an apiary can be managed when the bees are in single-walled hives, brings up the point of handling hives instead of frames. Preventing after-swarming by moving about the hives is an illustration. With small hives, or those that can be handled by sections, and in which the frames are securely fastened, the queen may be found by shaking out the bees, instead of going over the hive comb by comb. When raising extracted honey, the supers, with such hives, may be freed from bees in a similar manner, just as they are driven from a case of sections. When contracting the brood-nest, one section of the hive is removed, instead of taking out combs and putting in "dummies." As the physician judges of internal conditions by external symptoms, so the practiced eye of the bee-keeper can easily determine the condition of a colony without removing a comb. As a taking apart and thorough examination of the human body was necessary before it was possible to learn to accurately "judge of internal conditions by observing external symptoms," so movable frames allowed us to learn of the mysteries of the bee-hive, and to reach that stage when the taking apart of the brood-combs is seldom necessary. Such being the case, hives that allow us the most completely to handle them instead of frames are, other

things being equal, the most desirable.

There are also some minor points to be considered. Shall the bottom board be fast or loose? How shall the hives be put together at the corners? With what kind of a joint shall the different stories fit together? Shall the frames be covered with a cloth, or shall they be separated from the cover simply by a bee-space? etc. We will briefly give an opinion upon these points. For shipping bees, or for moving them from one locality to another, a fast bottom board is an advantage; aside from this, all the advantages, and there are quite a number, are with the loose bottom board. Unless hives are to go together with a "telescope" joint at the joining of the different stories, there is no

excuse for having the corner joints a bevel; unless the frames are covered with an oil cloth, or similar covering, there is no excuse for the "telescope" joint; unless the cover is raised more than bee-space above the frames, there is no excuse for the oil cloth; and there is no excuse for raising the cover.

As we said at the close of our editorial last month upon "Sections," this subject of "Bee-Hives" is a broad one, and it is impossible to touch upon all points; but correspondents are not only at liberty, but are invited, to introduce anything of importance bearing upon the subject. If anyone's "corns" have been trodden upon, let them "kick back" as vigorously and beautifully as has our friend Foster.

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THE "REVIEW."

If ever a bee-paper was started with a place ready and waiting for it, the REVIEW has enjoyed that good fortune. The first number was welcomed before it was read, and when it was read it took its place easily and at once among the things that justify their own existence, and need no probation before being fully and finally accepted. It is an imitation of none of its contemporaries, while it is on a level with the best of them, both in the merit of its general scheme and in its typographical neatness.

SPECIAL FEATURES.

One special feature is that of reviewing current apicultural literature. This is not done in the usual, stereotyped, conventional, platitudinal manner, but all the bee-journals are read, and when a valuable idea is found it is seized upon and made the subject of a short, crisp, terse editorial. Errors and fallacious ideas are treated in a similar manner. Another feature is that of making each issue what might be termed a "special number." A "leader," or introductory editorial, upon some special topic appears in the number preceding the one devoted to its discussion. This gives correspondents a cue to follow in preparing their articles for the coming number. No pains are spared to secure, as correspondents, practical, successful bee-keepers who are able to write, from experience, articles that are a real help to honey producers. The editor's extensive acquaintance with bee-keepers enables him to be eminently successful in securing exactly the information needed upon each topic. For a whole month he works upon each special topic, gathering together the best that is known upon the subject, and the cream of his researches appears in the next issue.

TOPICS ALREADY DISCUSSED.

The Jan. number discusses "Disturbing Bees in Winter." The Feb. issue is devoted to "Temperature," as applied to bee-repositories. The March number takes up "Planting for Honey." "Spring Management" is the special topic of the April issue. The May number discusses the "Hiving of Bees." "Taking Away the Queen During the Honey Harvest" occupies the June issue. The July number gives the best that is known upon "Feeding Back." "Apiarian Exhibitions at Fairs" is the special topic of the Aug. REVIEW. Sep. takes up the question of "Food," and its Relation to the Wintering of Bees. "Ventilation of Bee-Hives and Cellars" is well "ventilated" in the Oct. issue. The Nov. number cannot well be called "dry," as it is filled with the best of reading upon "Moisture, and its Relation to the Wintering of Bees." The present number, as will be seen, discusses "Sections, and their Adjustment on the Hive."

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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. The following is a brief outline of its

CONTENTS.

The "Introduction" gives a concise sketch of the author's experience in producing comb honey and explains how the book came to be written. The first chapter, "Securing Workers for the Harvest," sets forth the advantages of cellar wintering combined with spring protection; giving the best and cheapest method of securing the latter. Under the head of "Supers" the author names his favorite surplus case, giving reasons for the preference.

The next topic is that of "Separators." Their advantages and disadvantages, the conditions under which they are needed and the methods necessary for their abandonment are briefly told.

Then "Sections" are taken up; the good and bad qualities of the different kinds mentioned; the time for putting them on given; and the advantages of having them filled with comb, especially in the spring, fully explained.

The next three pages are devoted to "Tying-Up," in which the operations of this system are explicitly described, showing the ease with which it enables a bee-keeper to handle a "Honey-Show-er." Then follow "Hiving Swarms on Empty Combs," "Hiving Swarms on Foundation;" and, "Hiving Swarms on Empty Frames;" in which the question of profitably dispensing with full sheets of foundation in the brood-nest when hiving swarms is made perfectly clear, and thorough instructions given for its accomplishment.

"The Building of Drone Comb."—This appears to have been the great stumbling-stone in the road to success with starters only, hence six pages have been given up to this subject. Why bees build it, is well considered; and the way to prevent its construction made plain. The next two pages are used in answering the question, "What Shall be Used in the Sections?" That is, when foundation shall be used; when combs; and when the bees shall be allowed to build their combs. Under the head of "Secretion and Utilization of Wax," attention is called to the fact that we have been losing a big thing by not utilizing the natural wax secretion. Illustrations are given, and suggestions made.

TYPOGRAPHICAL NEATNESS.

So far as typographical neatness is concerned, the book is a little gem. It is printed from new type (brevier); the matter leaded; the paper heavy, delicately tinted and super-calendered; the press-work a credit to the craft. But it is the cover, which is bright yellow card-board, passed through a comb-foundation mill, that has brought forth the most enthusiastic encomiums. The work is very nicely done, and, at the first glance, the cover would almost be taken for foundation; while the beautiful twig of basswood upon the back of the cover and the artistic lettering upon the front, printed as they are upon a corrugated surface, all combine to give the book a peculiarly neat and tasty appearance.

The price of "The Production of Comb Honey" is 25 cts.

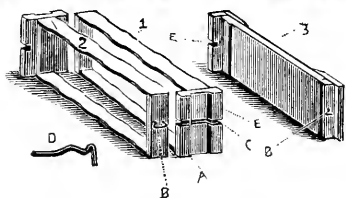
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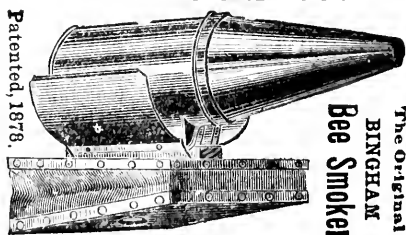
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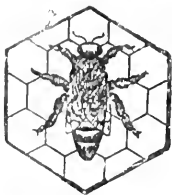
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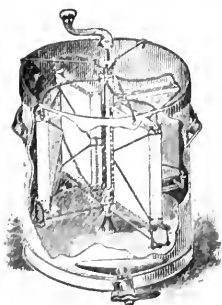
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