

red spots along the back, near the rear end. It has also a good many scattering black hairs along the body.

In the adult stage the female is wingless, like the female of the canker worm, and the male a small grayish-winged moth. The insects go into the pupa stage largely on the trees, and the females when they hatch deposit their eggs in masses on the leaves and cover them with a white, frothy mass. Usually two or three leaves are held together by the egg mass, and the whole remains on the tree over winter and is quite conspicuous, and collecting and destroying these egg clusters is a most effective method of combating this insect. As each egg cluster contains from 300 to 500 eggs, it is easy to see that even a few clusters left on a tree may mean a good deal.

What makes this insect difficult to deal with, and likely to be overlooked, is the fact that it hatches late, after the ordinary spraying has been done, and when orchard owners are usually busy with other work, and are not on the lookout for it.

We would urge farmers, particularly in the Annapolis Valley, to look over their trees at once and see if the fruit is being eaten, and if so, spray immediately with Paris green, using 1 lb. per cask, with plenty of lime, to prevent any possible burning. We should also put in the vitriol to make Bordeaux, as this will adhere better to the foliage than plain lime whitewash.

Of course the work of this insect must not be confused with that of the "green fruit worm," which usually eats but a single hole into the apple, and which works earlier in the season.

I am not an alarmist, and have no doubt this insect can be controlled if taken in time and properly managed, but it certainly is doing in the section where it is plentiful the most serious damage that we have seen from any insect pest. Caterpillars and canker worms will eat the leaves, but the tree will send out a new crop and go on its way rejoicing (though, no doubt, hoping that its owner will not permit such an outrage the following year), but when this insect takes charge the fruit seems to be doomed for that year at least. And another point worth considering is this: that the orchards which this year are overrun with the tussock moth were last year no more affected than a very large number are now. It will certainly pay to be on the watch for this insect's eggs the coming winter.

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APIARY.

Producing Both Comb and Extracted Honey on the Same Colony.

The following paper, by James A. Green, was read before the National Beekeepers' Convention in Chicago last December:

Whether comb or extracted honey can be produced most profitably, is a question that is often asked, and one that each man must settle for himself, according to the conditions under which he must work. Having settled this, he is too apt to assume that he should confine himself entirely to the production of one or the other. We all know something of the advantages of specialty, and I would be one of the last to decry them. Yet I think that, in many cases, at least, the beekeeper is making a mistake in so deciding. The extracted-honey man is all right. He has no need to produce any comb honey, and, in most cases, it will not pay him to do so.

With the comb-honey producer it is different. All practical comb-honey producers know that it is a difficult matter to get all colonies in such condition that they will enter the supers promptly at the beginning of the honey flow. A colony that is in just the right condition will go into the sections with a rush, and keep things moving right from the start. Another, apparently as strong in numbers, will hesitate about going into the super, and do nothing for some days except to crowd the brood combs as full as possible of honey. This perhaps results in swarming, which, in many localities, and with some systems of management, effectually spoils the chances of any comb honey from that colony. In any case, the colony that started promptly in the super is pretty sure to have a great deal more honey to its credit than the one that is slow about starting, even when they are apparently equal in all other respects. It is exceedingly important that the bees form the habit as early as possible of storing their honey in the super.

Beekeepers generally are in the habit of using "bait-combs" in the supers to secure this early start. But even a full super of drawn combs in sections is not as good for this purpose as a nice set of extracting combs.

For a number of years I have combined the production of extracted honey with that of comb. My extracting supers are only 6 inches deep, with the frames at fixed distances, firmly held in place by a thumb-screw through the side of the hive, after the style of the Heddon hive. This makes them easily handled as a whole, and none of the frames are ever handles separately until they come to the extracting room.

One of these supers is placed on each colony at the beginning of the honey flow. The bees enter this readily, and if there is any surplus to be gathered, it goes into the super. After the bees

are well at work in it, a super of sections is placed under it, after the usual tiering plan, or sometimes the extracting super is removed altogether, and replaced by the super of sections. The combs thus removed are placed over the poorer-working colonies. There will always be some colonies that will not do good work in the sections, because they are not strong enough in numbers, because they are not good comb-builders, or because they do not cap their honey with the nice white finish so necessary for a fancy article. On these colonies the extracting combs may be tiered up to any desired height, and left to be finished, or until you are ready to extract the honey. This gives you the ability to use profitably those colonies that are not good for comb honey. In most apiaries there are bees that are not fit for producing comb honey, simply because they fill the cells so full that their combs have a water-soaked appearance that detracts largely from its market value. These should be culled out, if comb honey is what you are trying to produce, and their queens superseded with better stock as soon as possible. In the meantime, they are just as good for extracted honey as any.

It takes a strong force of workers to work comb honey profitably. A colony that will do very fair work at storing honey in combs already built, may do little or nothing at building comb in super. That foundation principle of beekeeping, "Keep your colonies strong," applies with much greater force to colonies producing comb honey than to those run for extracting.

For this reason I keep extracting combs on all colonies that are not yet strong enough for the profitable production of comb. When they have reached the point where they can build comb profitably, the extracting combs may be exchanged for sections. When a colony swarms, or is divided, its comb supers go with the swarm, while a set of extracting combs is put on the old colony until it is in good working condition again. Any colony that any time during the honey flow is found to be doing poor work in the sections, has those sections promptly removed and replaced with extracting combs.

One of the greatest advantages of this combination system is seen at the end of the season. As the honey flow draws to a close, instead of giving new sections that may never be completed, give extracted combs to the colonies that are doing the poorest work in the sections, and give their sections to other colonies to complete. In this way you not only secure a larger amount of finished honey, but you avoid the expensive nuisance of having a lot of unfinished sections on your hands at the close of the season. By working in this way, I have sometimes had nearly every section in an apiary of over 100 colonies run mostly for comb honey, finished up in marketable condition at the close of the season. Another important point to be considered is that, in many localities, the last honey gathered is not fit to be put into sections, but can be much more profitably handled in the extracted form.

It will be seen that by this system there is considerable changing about of unfinished supers. Usually the supers are first freed of bees by the use of bee-escapes, but during the honey-flow I simply get out the greater part of the bees by smoking, and then shaking or "jouncing." The few bees that are left do no harm, and are just as useful in one hive as another.

Of course, a queen-excluding honey-board is a practical necessity with this system, but its advantages are so many and so great that I would not think of doing without it.

Several years ago I was much taken up with the idea that has been made public during the past season, of using one or more extracting combs in each comb super, but I soon gave it up, as it seemed to me too fussy and complicated, and not nearly as well suited to the work in a large apiary as separate supers, used according to the needs of the particular colony.

The system I have outlined has been in practical use in my apiaries for nearly twenty years. There are some small advantages that I have not mentioned, but, briefly, the advantages of the system are that it secures more honey, a higher grade of comb honey, saves a great deal of waste, and does it with a control of the bees and an economy of labor that is not to be secured by any other method that I am familiar with.

Considerable discussion followed the reading of the paper. We append the comments of Mr. R. F. Holtermann, of Brant Co., Ont.:

"The objection which I have seen to the production of comb and extracted honey in the same hive is this: It requires a good deal of concentrated energy to produce good comb honey; and as far as skill and time are concerned, it requires more careful and skillful application to produce good comb honey than it does good extracted honey; and where you have a percentage of your extracting combs in that super, you are really producing extracted honey at an increased expense, compared with comb honey, and the more you produce, the greater is the cost of producing that extracted honey. The question has been touched upon as to the unfinished sections on the outer

sides of the hives. It has also been mentioned that it is not necessary to have those unfinished sections. That, I am thoroughly satisfied, is correct. I learned some years ago by putting in wedges between the bottom-board and the brood-chamber, that the brood-chamber was practically raised an increase of $\frac{1}{2}$ of an inch from the bottom-board, and by that means the bees are compelled to go up at the side. By having a double-bee space at the sides, by careful experiment, I have found that the outside sections are in many cases even better filled than the center.

"I have never seen a bait section as well finished as a section built upon comb foundation. But, on the other hand, I want to plead this, that for these bait sections you can get a better price than you can get for honey after it has been extracted from those extracting frames. That is the reason I do not consider the system without its faults.

Removing Combs from the Hive for Extracting.

In how many apiaries throughout the land does the season for extracting become a season of dread? Time was when it was the same to me; but long experience and careful observation, and pointers from others whom I have met at conventions, and the reading of articles in bee journals, have changed all this, and now we often extract in out-apiaries in buildings very far from beehive-tight. During the robbing season we extract all day, and for years have not been compelled to stop work. To go into the details of management to accomplish this will necessitate another article. The present is simply to cover the removal of combs from the hive to the beehouse.

We work in pairs, the least experienced doing the smoking, although to smoke bees "to perfection" requires great skill, close observation, and faithful work.

The next hive to operate upon is smoked while we are about to open a new hive. Smoking is done through the ventilator. To smoke the bees at the entrance is to drive them into the super. The hive is not jarred, but handled carefully. The cover and cloth, or honey-board, are removed from the super, and the bees smoked. A swinging motion of the smoker throwing the smoke between the combs from end to end is far more effectual to drive the bees down than to smoke in the usual circling motion, and largely across the combs. If there are two supers on the hive, the combs are taken out of the first super, shaking the bees in front of the hive, but so far in front that they are not likely to reach the brood-chamber before the super next to the brood-chamber is being operated upon. We work quickly but not roughly. Let movements be rapid, purposeful, but not nervous. We avoid crushing bees; and by having straight combs and using a little careful judgment we have no trouble about crushing bees. I now catch hold of the top-bar ends with thumb on one side, fore fingers on the side-bar and the rest of the hand on the other side of the frame inside of the hands, facing each other, and make a quick shake, followed by a rapid reversal in motion, and another quick shake down, done in less time than it takes to describe it, and yet the bees have had three attempts to dislodge them, followed in rapid succession. To hold a heavy comb by the top-bar lugs alone would break the lugs in many cases, but by also pressing on the side-bar, much of the weight is taken from the lugs. I also find that the staples driven into the top-bar weaken the lug, and they are more liable to split off. Your metal spacers would have the opposite effect. Unless with some strains of Italians, I find, after such shaking, but few bees upon the comb. Whatever is left upon the comb is brushed off.

For twenty-five years I have tried almost if not everything recommended as a brush if within reach, and some things which had to be purchased a long way from home. A turkey feather and wing, or a goose wing, was the first. I find these too harsh. There is not give enough to them; and even with an experienced hand the bees are likely to be more or less crushed or rolled under the feather, and they will fight the feather. I have seen the bees do it many a time. Asparagus and weeds do not last, and are too irregular, and much time is lost in looking for more. The Cogshall bee-brush, which should be used only at the end, has sufficient play, but does not cover enough surface at a sweep. The Dixie bee-brush is all right at first; but when it has been put in water it hardens, and when in use becomes tangled. However, I prefer it to any of the above-named articles.

More than a year ago I saw cataloged a German brush, and sent for two. It is a hair brush. Water has had no effect upon it. The hairs are long enough to be pliable and not crush the bees if caught between the brush and the comb. There are neither too many nor too few hairs in the brush, either being a defect. With that brush we brushed at least comb surface enough to contain 30,000 lbs. of honey, 60,000 lbs. being one crop. I showed the brush to many, and it looked, aside from a dulling of the paint on the wood, about as good as new. Even when used by a novice, as it was many a time, we never saw the bees try to fight it. It was shown at conventions in Canada, and many wanted to buy one like it, among them some of our very best-known Canadian beekeepers (I have none for sale). I never used a brush its equal. It could be washed in a moment, and be again ready for use, water not changing