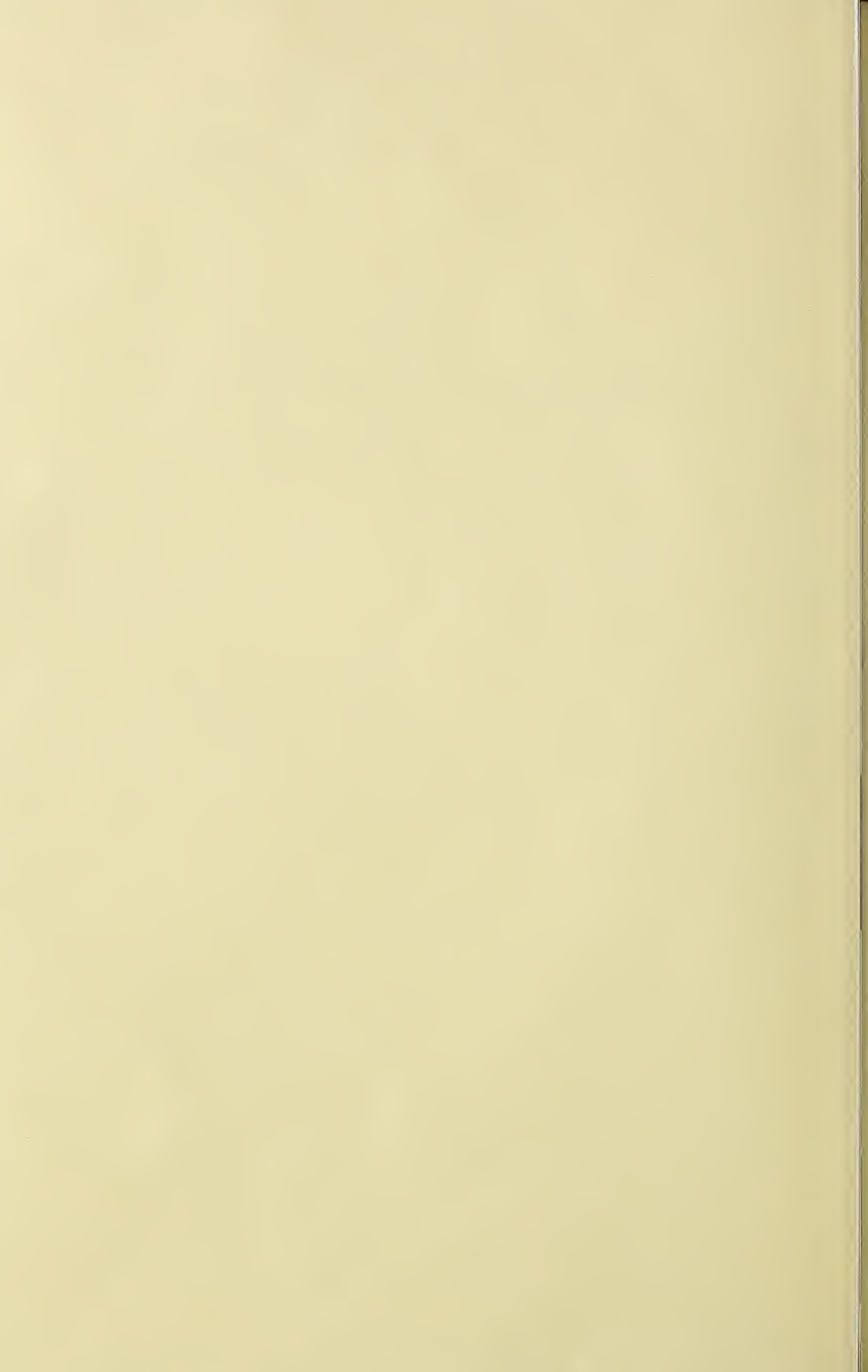


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GLEANINGS IN BEE CULTURE

APRIL, 1919

EDITORIAL

A REPORT has recently gained circulation in California that E. R. Root, now in that State, had offered on behalf of his company \$25,000 to the metal-comb



An Untrue Report.

people for their patent. When Mr. Root first heard this report, he regarded it as a joke. But as the report has been again and again repeated and many beekeepers have asked as to its truth, Mr. Root has wired Gleanings to the effect that he has made no such offer whatever, and very certainly reserves his judgment of the metal comb until he has made a thorough test of it with the bees.



Necessity for Comb-honey Production.

of the market with extracted honey. So nobly did the beekeepers rally to their country's call for an increased food supply by producing extracted honey and so well did the change pay the beekeeper during war time that many have forgotten the real place that comb honey held before the war, and the place it will again hold as the country gradually readjusts itself. No extracted honey, however excellent its flavor, can ever be quite so pleasing a table delicacy as fine comb honey.

A vast number of beekeepers changed over last year and are now planning to continue in the production of extracted—many of them large beekeepers, too. What is to be the result? Will there not be an overproduction of extracted with a corresponding slump in prices; and will not comb-honey production become nearly a lost art? If the public were sufficiently educated in the use of honey, there could be no possibility of overproduction for years to come. But the public is not yet sufficiently educated to demand honey as a food staple, so there is the need of large production of the more attractive kind of honey—comb.

Not every beekeeper is expert enough to raise comb honey. Those who are, and especially those that have the necessary equip-

ment on hand, could even now save the day, and incidentally increase their incomes for next year by returning to their previous practice of raising comb honey.

KNOWING THAT our readers would be interested in the condition of colonies and the crop prospects for the coming season, we sent out queries to many beekeepers throughout the United



Prospects for the Coming Season.

States. Their kind co-operation enables us to report a fine condition of colonies generally and a good crop prospect the coming season. Only five per cent have reported anything less than good or excellent wintering. Eastern Virginia reports poor wintering, and California reports their colonies have wintered from 80 to 90 per cent as well as usual. More than one-third of the replies show a lack of stores. In a few cases equalizing will remedy the trouble; in others, feeding will have to be resorted to on account of early brood-rearing. Altho rather light stores have been reported from New Jersey, Massachusetts, Iowa, and eastern Virginia, the greatest shortage seems to be in the North and West.

Twenty per cent of those who replied to our questions either believed it too early to judge or else feared the open winter might have injured the honey plants, and were, therefore, unwilling to express an opinion as to crop prospects. Four per cent report the condition of the honey plants from 50 to 60 per cent of the normal condition at this time of year. The other correspondents consider the prospects all the way from good to excellent.

BECAUSE OF THE exceptionally warm weather this past winter, colonies are now in an unusual condition for this time of the year. Some colonies, especially those with little packing, have been weakened by having the bees tempted out on sunny days only to become chilled and unable to return. Also, many colonies have been breeding earlier than usual and have



Require Special Attention.

thus used up considerable quantities of stores. In the case of hives not sufficiently packed it is possible that a sudden cold snap may now result in the destruction of all this brood and the consequent loss in the honey and energy expended in its production. As soon as a warm enough day arrives, an examination should be made, and the stores replenished if necessary. If possible, frames of honey should be inserted; lacking these, a hard candy should be given.

We notice one of the journals having a million circulation has in its January issue an article discouraging the use of hard candy, and recommending as feed to be placed on the tops of the frames a soft candy made by mixing pulverized sugar with extracted honey. This is exceedingly poor advice to be spread broadcast over the country, and we heartily condemn it. Such candy, if fed at all, should be placed in a dish; for it soon absorbs moisture, runs down between the combs, killing all the brood with which it comes in contact, and gradually spreads over the bottom of the hive and runs out at the entrance. In some cases we have known an entrance to become completely closed by the candy, and the colony killed outright.

For a good candy we recommend the following: Place on the stove a granite or aluminum kettle containing granulated sugar and a little water, stirring until the sugar is all dissolved and the syrup very thick. Then bring the syrup to a boil. As soon as the boiling begins, the stirring should be stopped and the boiling continued until when one dips a finger into cold water, then into the boiling syrup and back again into the cold water, a thin film hardens on the finger and will just crack when the finger is bent. At this stage the syrup should be removed and poured into pans lined with paper. When pouring the syrup the dish should not be scraped, nor the pans be moved or jarred until after the candy has hardened. When cold, the candy will be hard and transparent.



A CONSIDERABLE of a hornet's nest, or rather a bee's nest, was stirred up among



Some New Bee Legislation.

the beekeepers of California over some proposed bee legislation that called for a tax of ten cents per colony, license fees that might be revoked, and some appropriations of sums in amounts of \$10,000 and \$15,000 each.

It appears that a proposed law in California must be submitted 30 days in advance; but apparently legislators can get around that by proposing a dummy bill and then substituting another under the same title and number. There were several dummy bee bills introduced, with the expectation, so we are told, that they would be amended.

Whatever the bills were, they were unsatisfactory to the rank and file of beekeep-

ers. The Southern California Beekeepers' Association took up the fight against the bills and this was followed by the State Beekeepers' Association. Even members of the California Co-operative Honey Producers' Exchange repudiated the bills, notwithstanding that one of their members placed one of these bills in the hopper, with no thought of its passage in that form. Who is responsible for the others no one seems to know.

The thing that raised the ire of almost everybody was the proposed tax of 10 cents per colony and the scheme of licensing beekeepers, with the possibility of the license being revoked at the will and whim of the inspector. After several conferences, a meeting of all the parties interested was held, and it was tentatively agreed at that time to drop all legislation for the time being and wait until Dr. E. F. Phillips of the U. S. Bureau of Entomology and his corps of workers should come back into the State the following fall. There the matter seems to rest for the present.

There is probably nothing in a decade that has stirred up such a nest of mad bees, or more exactly beekeepers, as this proposed legislation of a tax of 10 cents per colony, a license scheme, and the various funds, the meaning and purpose of which no one seems to understand.



H. H. SWEET of The A. I. Root Company of California has for years used a scheme



A Clever Idea.

for making division-boards for early spring that is not only unique and cheap, but useful.

He wraps a newspaper of suitable length vertically around a common Langstroth comb. When this frame wrapped in newspaper is pushed down in the hive, the folds and projecting ends of the paper make a tight contact with the bottom-board, ends, and cover of the hive. A similarly wrapped frame on the other side of the brood-nest makes a tight warm compartment.

If the two outside frames of a 10-frame hive are wrapped in the manner explained, it makes on the sides a double-walled hive for an 8-frame brood-nest. As the season advances and the bees need more room, they gnaw away the newspaper and fill it with brood, pollen, or honey.

In the case of a 3-frame nucleus, this scheme of using two newspaper-wrapped frames can be used to most excellent advantage, for a nucleus should not have more room to keep warm than is absolutely necessary.

Mr. Sweet's scheme of making division-boards out of brood-combs and newspapers may save thousands of nuclei all over the United States. It is so cheap and simple that where a bunch of bees in the spring doesn't fill the hive, the beekeeper can't afford not to use it, if they are not otherwise protected.

"O H, yes!"
 you say,
 " Cali-

fornia, the land of sunshine, is a veritable paradise for bees. All you've got to do is to get the wild bees, that cost nothing, out of the rocks and they will earn you \$25.00 to \$50.00 per colony. Yes siree! Honey just rolls in every day for six months in the year. Bees work for nothing and board themselves. No cold; no sickness for the apiarist; no wintering problem; no bee disease for the bees. Yep! The gold dollars fairly roll off the sides of the mountains where the sage grows, and into the pockets of the beekeeper. Whoopee! Let's all go to California!"

As Good or Better Yields Elsewhere.

Many beekeepers of the East, tired of their cold and severe-winter problems, may desire to come here, thinking the conditions are like those named above. Would that they were! I have spent some two months here already, and my conclusion is that there are some real and serious problems here. The chances of a beekeeper making a success here are no greater, if as great, than in some of the good bee States of the East. As large, or larger, aggregate yields per colony are secured in Michigan, Wisconsin, Minnesota, Iowa, Ontario, or New York, in spite of their long severe winters. I am not so sure but that the Rocky Mountain States may be ahead in yield per colony.

As a matter of fact, the Eastern States usually secure their main crop in a month or

CALIFORNIA'S BEE PROBLEMS

*Many Disadvantages Out There.
 As Good Yields in the East. The
 Winters Are Hard on Bees*

By E. R. Root

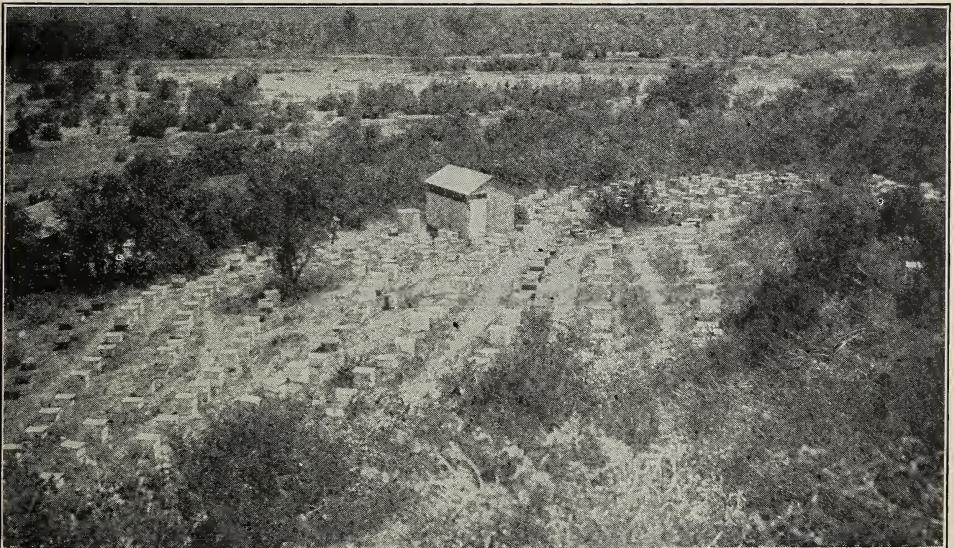
very little if in the cellar.

A Difficult Wintering Problem.

In California, as pointed out in the last issue, there is a real wintering problem. The cool nights, down nearly to freezing at times, and the warm days are very hard on the bees, and any one back in the East who imagines there is no cold, no chilling of brood, no bee mortality in California, is seriously mistaken. Unless one happens to be where there is plenty of eucalyptus and other sources of nectar, there is great danger also of starvation; and too many times the careless beekeeper has relied on winter flows that do not materialize, and his bees starve or are so weak as to be good for nothing. It is estimated by some good beekeepers in the State that colonies ought to have in reserve from 30 to 50 pounds of honey, because they say if these stores are not actually needed, they can be extracted in the spring just before the first new crop comes in. There is no question but that an ample reserve of stores is a good investment.

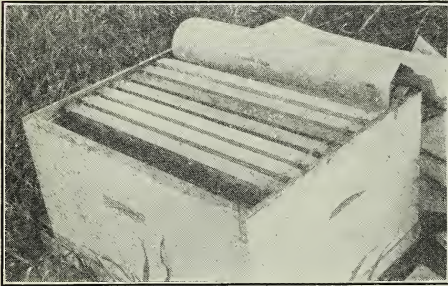
The real wintering problem here is that the breeding that goes on during the winter very often does not make up for the loss of the old bees that go to the fields and never come back, on account of chilly winds or the cold. Cold? Yes, during December,

six weeks' time
 During the rest
 of the year the
 bees require
 only intermit-
 tent attention,
 and during the
 winter months,
 no attention if
 outdoors, and



No. 1.—Apiary of L. W. Wells, at Somis, Calif. This is a characteristic view of the thousands of apiaries scattered over the hillsides of California during the winter. Notice that the bees are in two-story hives.

January, and February an overcoat is not uncomfortable to the beekeeper, even in the daytime. Thousands of colonies all over the State, so I am told (and this is borne out by personal observation in yards that I have inspected), hardly hold their own. Many become so weak that they are little more than two- and three-frame nuclei. The chill of the night kills a great deal of brood; moreover it checks the queen, and the consequence is there will often be very small patches of brood on two or three frames



No. 2.—This should be studied in connection with Fig. 3. Method of packing a single-story colony that occupies only 7 frames. An ordinary city newspaper is just about the right width to cover the top and sides of a 7-frame cluster. The two ends project over the empty space on either side. Other folds of newspaper close up the space. See Fig. 3.

which the bees are just barely able to cover and keep warm when the temperature drops during the night.

Good management, particularly if the localities are at all favorable, to a large extent overcomes this heavy loss of bees from early fall until early spring; but even with the best of treatment there may or may not be a constant depletion in strength. The result is that colonies are not seldom too weak to take advantage of the orange flow, which is often heavy. So heavy is this flow that if there comes a day or two of cold and foggy weather, when the bees can not fly, that nectar will drip all over the clothing of the pickers, as they take the matured fruit off the trees. It should be understood that there may be ripe fruit as well as new blossoms on the tree at the same time.

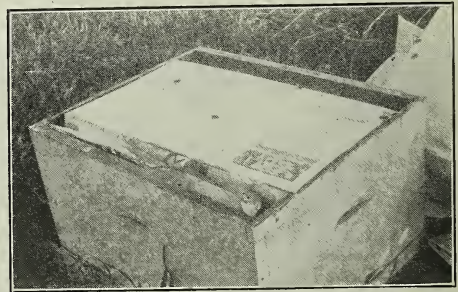
The Need of Protection.

What is the remedy? One word covers it, and that is PROTECTION. I am convinced that if bees need to be warmly housed anywhere in the United States, it is in California. From some experiments that I have been making, I find that I have been able to build up colonies very rapidly by reducing the size of their winter quarters or giving them wrappings of paper. In a number of apiaries that I have visited in the last month or so, I find that there are four-

and five-frame nuclei in the lower story of a 2-story 10-frame hive.* Bees in California, so far as I have been able to see, are wintered mainly in two stories. In the fall their colonies are strong enough to occupy only one story, but they need the other story, some say, for the stores. On account of the severe fluctuation of temperature between night and day, in too many cases the strength of the colony goes down much more than it does in the East where the colonies are well packed or put in cellars. I should imagine that the actual loss in California is as great as in some States where the winters are very severe. This does not mean a loss of colonies, but a loss of bees. From the standpoint of capacity to produce honey, it would be better to have 50 colonies of fair strength than to have 100 that are weak. This is an axiom in beekeeping that is so generally accepted that it doesn't need any argument to prove its truth.

I am convinced that N. A. Blake of Pasadena, Calif., is pursuing the right policy, when early in the fall he puts the story with the bees and brood on top, if it is not already there, leaving the other story with the combs of stores beneath. This puts the bees up in the warmest part of the hive. I find a great many beekeepers are leaving the bees in the lower story. When the cluster is down to five frames it is up against the problem of trying to keep its brood-nest warm, notwithstanding the heat is constantly rising into the upper story.

Some argue that they put the upper story on top to keep the combs away from the moth miller. They would be just as safe below the cluster. Others say that the bees



No. 3.—In some cases where the bees are packed this way, the paper becomes damp from the breath of the bees. In other cases bees will gnaw at the paper, carrying it out of the hive bit by bit. For this reason it is recommended to use oilcloth next to the bees, and paper on the outside, as additional packing.

would breed too fast if on top, and that when put below the colonies are stronger in the spring. I can't see why.

What Kind of Protection.

I have spoken of the fact that I have been conducting some experiments. By crowding three- or five-frame nuclei down to the frames that they can actually cover

*Foul-brood Inspector Geo. B. DeSelle of Los Angeles County tells me that he has for years been advocating wintering in one story because two stories make too much room for the bees to keep warm.

and putting them in one story, covering the frames with paper and filling the space with packing material, I find that the bees build up very rapidly. I took one little yard and crowded the bees down to the frames they were occupying, giving them frames of stores and taking off the upper story. The lower story was then packed in the manner stated. The result is that this little apiary is fairly booming.

In what form would I give the packing or protection? One thing I would do, I

bees on 15 or 18 combs of stores and then put packing on the sides. If packing should be put on top, this would give very good protection.

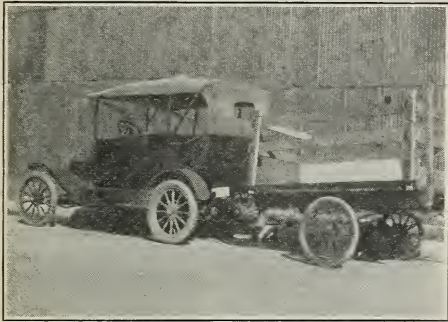
I am not sure but that double-walled hives in the State would be good economy. The extra walls would prevent the heat of the sun during the middle hours of the day from penetrating into the hive and stirring up the cluster to unusual activity. It would prevent the cold of the night from chilling the brood and would make it easier for the bees to take care of the brood than they can under the present plan of wintering.

The Problem of Bee Disease.

Another very serious problem is bee disease. In spite of all the inspection that has been carried on, bee disease, if I am correctly informed, is spreading in the State. What is needed is more education for the small beekeeper, and that means bee extension workers sent out by the State, whose function would be rather to educate as to how to know and distinguish the two types of brood disease and how to treat them.

If there is any Eastern man thinking of coming to California because he thinks that the State is a veritable paradise for keeping bees, he may find that he is jumping from the frying pan into the fire. That money has been made by keeping bees in the State cannot be disputed. I already know of a half-dozen beekeepers who last year went beyond the \$10,000 and \$20,000 mark in the production of honey. At the present high scale of prices, the very fact that bees can not be purchased at any price, and that they bring all the way from \$10 to \$20 a colony, shows that the business is not as bad as it might be.

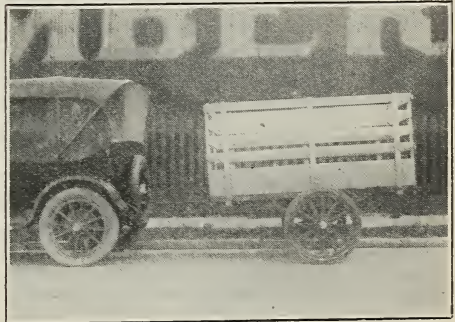
Incidentally it might be remarked that what is good in the way of packing and pro-



No. 4.—Ford and trailer used by Mr. Sweet in moving the 18 colonies mentioned in the text. Notice that the wheel on the outside is wire. The mate to it on the other side broke down and was replaced by a wooden one "to get it home." A two-wheel trailer, if rightly designed, will carry from 700 to 1,000 pounds. In some places one can be rented for \$1.50 a day. Its cost will run all the way from \$50 to \$150. It is a very common practice in California for beekeepers to move their bees with a two-wheel trailer. All the way from 30 to 50 colonies can be moved at a time. The big mileages that can be covered make it possible for one to move 150 colonies in a day with this kind of equipment, but one should remember to have *wooden* wheels instead of those made of wire. See Fig. 5.

would follow the plan that Mr. Blake pursues of putting the brood-nest on top, not on the bottom. Furthermore, I would confine the bees to one story in localities where there was willow, eucalyptus, or other sources of honey during the winter. If the cluster couldn't cover 10 frames, I would squeeze it down to 8 or 6. I would put oil-cloth over the tops and sides of the cluster. Over this I would put newspapers so as to confine the heat to the space the bees can actually occupy; and I would use a double cover, one telescoping over the other. I would also contract the entrances.

A better arrangement, perhaps, would be to have strong colonies in the upper story with honey in both stories, and the more stores the better. If the beekeepers in the State had larger brood-nests, or larger hives, so that the stores and the cluster could be in one hive, it might be better. If I were using 13-frame, or long-idea hives, I would crowd the bees down to as many frames of stores as they could cover and then put packing on the sides. With the long-idea hive of 32 frames, one could crowd the



No. 5.—This is a better trailer and costs about \$150. It will handle easily at one load 50 colonies, or one ton of weight. For moving bees it is always best to have a strongly built machine.

tection in California during winter would be equally good in the Eastern States for bees taken out of cellars.

Sacking Bees for Moving.

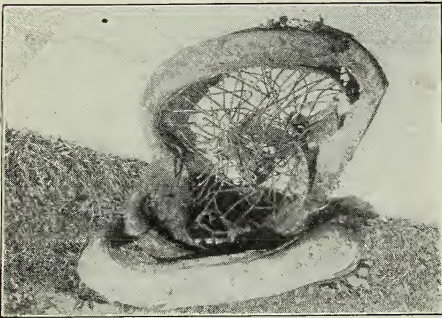
One night last week, H. H. Sweet, superintendent of The A. I. Root Company of

California at Los Angeles, asked me if I would not like to go out with him and move some bees after dark. Night is the worst of all bad times to handle bees. Mr. Sweet said that it would be necessary to take off the upper stories or supers and crowd the bees down to one story. "Do this after dark?" I asked. "Yes," he replied. "All right, I am game if you are," I said.

We had to drive about 17 miles. He hitched his Ford to a two-wheeled trailer which is better for a Ford than a four-wheel. No provision was made for any hive screens or entrance-closers. When he told me that the hives were very old and full of cracks, I remarked that we would have a mess on our hands. Pointing to a pile of burlap sacks, he said, "I am going to put them in those sacks." I had read of this trick, but was never present when bees were put up in that way.

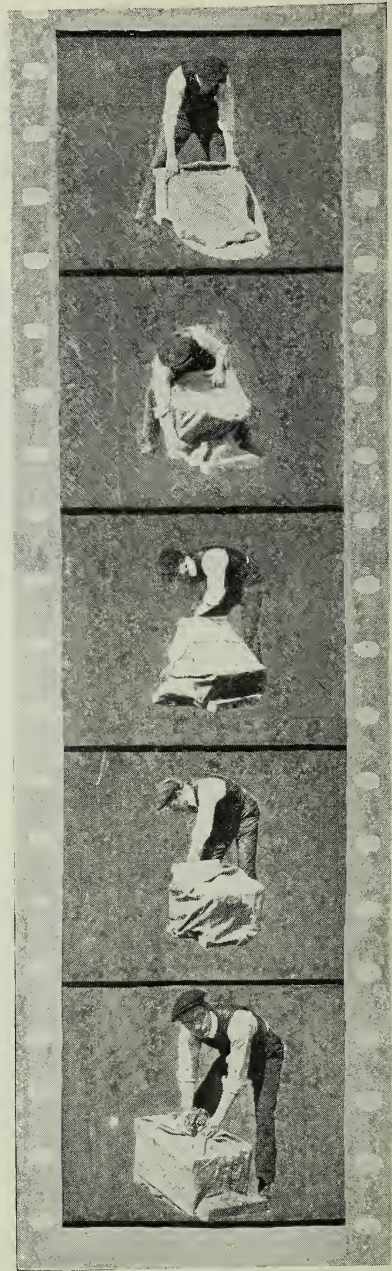
"Those wire wheels—will they stand up under a load of 20 colonies and equipment?" I asked. "They are guaranteed to," said Sweet. "Maybe so," I said.

On arriving at the yard, we took off the supers, after smoking the bees at the en-



No. 5.—The thing that changed the sweetness of Superintendent Sweet's face to sour. What he *thought*, he said afterwards, wouldn't pass muster with A. I., not even with M.-A.-O. Incidentally it may be observed that wire wheels are dangerous where heavy loads are used or fast driving is a pastime. The photograph tells its own story. If there is anything that is exasperating, it is to have a load break down along about midnight when moving bees.

trance. They came out all right and in some instances met us more than half way, even tho it was dark. My! how they did sting! After we had gotten the supers off and shaken the bees in front of the entrance, the next problem was to get them in the hives. A little smoking and coaxing (and some more stings) got them in. Mr. Sweet then went at the job of "sacking the bees." With a sack in one hand, he tipped a hive at an angle of 45 degrees, entrance up, and with the other slipped the sack over it as far as he could, then he set the hive down, pulled the sack back over, and tied the mouth with a heavy string. It was done in almost the time it takes to tell



Above is shown stage by stage Supt. Sweet's method of sacking bees for moving. The exact mode of procedure is shown in the order of the pictures, reading from above down. Where the hives are old, especially if they are full of cracks, or the cover does not fit tightly, this plan of moving bees is ideal. Even if the hives are good, it is probably cheaper than the entrance-closer and a hive screen over the top. To sack a colony is a matter of seconds only.

it. In an incredibly short time we had every colony sacked and loaded on the trailer. The bees made a hissing in the sacks and some of the colonies were very strong; but there was no danger of the bees suffocating, said Sweet, because they could get out into the sack, which was very roomy and porous.

We cranked the Ford and off we started. We got within three-quarters of a mile of our destination, and down went the right wheel of the trailer. The expression on Mr. Sweet's face was anything but "sweet." Wire wheels—he had had enough of them for all time. There was nothing to do but unload the sacks of bees and put them into the Ford, carrying ten hives at a time. Three loads carried the bees to destination, but in loading and unloading, some of the hives

fell off and rolled over on the pavement. I had expected that many bees would be smashed, but Mr. Sweet reported that not over 200 dead bees were found in any sack after the hives were unsacked.

I might remark that he didn't even take the time or trouble to fasten down the covers. He said he had moved hundreds of colonies in this way at night and always with the best of results.

When hives are old and full of cracks, the plan is ideal. I am not sure but that it is cheaper and quicker than entrance-closers and hive screens even when the hives are good. A set of sacks costing about ten cents each would be good for dozens of movings. The time is approaching in the Eastern States when many will move their bees. I suggest that the sack plan be tried.



THE question of spring management is "the question of the hour," and Gleanings has had the curiosity to look up the "authorities" on this

EARLY SPRING MANAGEMENT

Comparison of the Views of Leading Authorities as to What to Do for the Bees in Spring and How to Do It

By Iona Fowls

subject, and set down together their teachings on each of its particular phases. This has not been a small task, but it has been an informing one. Perhaps the greatest revelation that came to us from reading a number of authorities on the same subject at the same time was the inadequacy of the indexing of these books. It's pretty nearly "fierce" in most of them. Next to the faulty indexing was our surprise to find the different authors treating of the same topic under entirely different heads. We were also surprised to find that certain of the problems of spring management regarded as important by some writers are hardly named by others.

But, as best we could, we have dug out from their written books what a half-dozen leading beekeeper authorities have said on spring management. Possibly, we have skipped what some may have said on the subject—especially if hidden away in the discussion of some other subject. But here are given the different authorities' views as we have found them.

Object of Spring Manipulation.

All agree that the object of spring management is to put the bees into the best possible condition for gathering the approaching honey flow.

(The following five sub-heads have been mentioned as having a bearing on the drifting problem.)

Time of Removal from Cellar.

L. L. Langstroth-Dadant.—"Unless the day when they are put out is very favorable,

many may be lost when they fly to discharge their feces. In movable-frame hives, this risk can be greatly diminished by removing the cover from the

frames, and allowing the sun to shine directly upon the bees; this will warm them up so quickly, that they will all discharge their feces in a very short time. To our minds, 45 degrees in the shade, or 55 degrees in the sun, is the lowest temperature in which it is best to put bees out."

Dr. C. C. Miller.—"Generally, I go by the blooming of the soft maples." "When the red of the blossoms actually begins to push forth," * * * "I watch the thermometer and the clouds, and usually in a day or two there comes a morning with the sun shining, and the mercury at 45 or 50 degrees, with the prospect of going a good deal higher thru the day."

Dr. E. F. Phillips.—"They should not be taken out until fresh pollen and nectar are available, unless they show pronounced signs of dysentery, as indicated by spotting of the hives or by undue excitement." * * * "To prevent drifting, it is best to set the bees out when it is too cold for them to fly, so that as the weather warms, permitting flight, this will take place more naturally."

M. Quinby.—"It is a good rule to leave them as long as they will remain quiet. In my own practice I prefer not to set them out until just as the soft or red maple begins to blossom." "It is much better to remove them on a cool than on a warm day."

W. Z. Hutchinson.—"Wait until the snow is gone, and there is occasionally a day warm enough for bees to fly, then take them out to remain permanently. If the

bees have to wait even a week or two after being placed upon their summer stands, before having a flight, no harm will come as a result, provided they have not wintered poorly."

E. W. Alexander.—"We like to keep them in the cellar until the most of that chilly weather is past." When it "has every appearance of bad weather for the morrow, we commence about sundown and carry out all of our bees." * * * "We don't want any to try to fly until they have been out two or three days."



L. L. LANGSTROTH.

A B C and X Y Z of Bee Culture.—"Advise waiting till the time when natural pollen comes, or in our locality, soft maple bloom." (Endorses Alexander plan.)

Setting Out at One Time or in Installments.

Langstroth-Dadant.—"If the hives are all removed from the cellar on the same day, there will be little danger of robbing."

* * * "At different times we have seen bees desert their hives." * * * "The worst of these desertions is when the bees have suffered while wintered indoors." * * * "When such desertion is feared, it is better not to put out more than one dozen colonies at one time, and to prepare a few dry combs in clean hives, to hive the swarm as soon as possible."

Dr. C. C. Miller.—"Some object to taking all the bees out at the same time." * * * "I have never had much trouble in that way."

M. Quinby.—"Eight or ten hives should be set out at once; after they have been out two or three hours, set out as many more. When all are taken out at one time, they are quite sure to mix and unite with colonies where they do not belong."

E. W. Alexander.—"We commence about sundown and carry out all of our bees—yes, even if it takes not only all night, but into the next day."

A B C and X Y Z of Bee Culture.—"When bees are set out two or three different times, those first set out having marked their locations, and having quieted down, are quite liable to rob those set out afterwards."

Placing Colonies on Their Old Stands.

L. L. Langstroth-Dadant.—"As bees remember their locations, it is important to return each colony to its own place."

Dr. C. C. Miller.—"Sometimes some attempt is made to have colonies occupy the same stands they occupied the previous years, but oftener no attention is paid to this."

Dr. E. F. Phillips.—"Colonies which are wintered in the cellar need not be put in the same locations that they occupied the previous year."

M. Quinby.—"They are more particularly

disposed to do so," (to mix), "when any stands have been changed or set in a new place." * * * "It is an advantage, but not all-important, that each hive occupies its old stand when set out in the spring. To this end, they should be numbered, and when brought out they can be placed where they are to remain."

E. W. Alexander.—"This loss (from spring dwindling) can also be almost wholly prevented by placing the hives, when taken from the cellar, so the entrances will face the north." [Evidently not on old stands.]

A B C and X Y Z of Bee Culture.—"After bees have been shut up in the cellar over winter they can be placed back on the old stands they formerly occupied or they can be put anywhere in the yard."

Contraction of Entrances.

L. L. Langstroth-Dadant.—"The entrance also must be reduced."

Dr. C. C. Miller.—"As soon as my bees are taken out of the cellar, the entrances are contracted to a hole three-quarters of one inch square."

Dr. E. F. Phillips.—"The entrances may be reduced, or, if necessary, may be closed with wet cloths."

M. Quinby.—"Keep entrances contracted to prevent robbing."

W. Z. Hutchinson.—"If the entrance is contracted so that only one or two bees can pass, a strong colony can make no more of a demonstration than a weak one."

E. W. Alexander.—"We allow an entrance only $\frac{3}{8}$ by 1 inch, and sometimes less; then when a warm day comes, we enlarge it according to the needs of the colony; then towards night close it again if it is likely to turn cold."

Other Preventions of Drifting.

Among other suggested factors of drifting are the following:

M. Quinby.—(If they drift) "the best way is to simply change hives, taking the strong one to the stand of the weak one, and the reverse."

Dr. E. F. Phillips.—"It is claimed * * that if the cellar is well aired the night before the bees are to be removed they will be in better condition and will drift less; but it is not clear what difference this can make unless the clusters are made tighter because of lower temperatures."

Cleaning Hives.

There seems to be little question among these authorities that it is sometimes advisable to clean out the hives early in the spring instead of leaving it for the bees to attend to later. If colonies have wintered as they should, about the only thing that can be cleaned out is the propolis.



C. C. MILLER.

Spring Protection.

L. L. Langstroth - Dadant.—“The hives should be located in a warm, sunny, well-sheltered place.” * * * “The heat should be concentrated in the brood-apartment, by all means, and not allowed to escape above.”

Dr. E. F. Phillips.—“It is preferable to provide packing for these colonies even if it is only a wrapping of waterproof paper over the hives.”

M. Quinby.—“Shut off all upward ventilation to retain the warmth.”

W. Z. Hutchinson.—“A sheet of tarred building-paper folded down over the hive, and fastened at the lower edges by tacking on strips of lath, will answer every purpose.” * * * “It will save the loss of brood and weak colonies if there comes a ‘squaw winter’ in the month of May.”

E. W. Alexander.—“I wish to call your attention to the importance of keeping your bees as warm as possible all thru the spring. If you can, try to have them set where they will have a natural windbreak of some kind.” (See Entrances.) “Also cover your hives with tarred building-paper.” * * * “If you will do as I advise,” * * * “so far as keeping them warm is concerned, they will gain fully three weeks’ time, over the way they are generally cared for.”

A B C and X Y Z of Bee Culture.—“It may be necessary in some climates, after the bees are set out of the cellar on their summer stands, to provide some sort of protection.” * * * “If they are in winter packing-cases” * * * “leave the packing on until settled warm weather has arrived.”

When to Examine the Colonies.

L. L. Langstroth.—Dadant.—“In early spring.”

Dr. C. C. Miller.—“I do not want to open up the hives except at a time when it is warm enough for bees to fly freely. Too much danger of chilling the brood.”

Dr. E. F. Phillips.—“On a fine warm day when the bees are flying freely, he should make a first general examination.”

M. Quinby.—“After the first flight, the queen will commence depositing eggs. Each hive should now be examined to ascertain its exact condition.”

E. W. Alexander.—“Shortly after taking them from their winter quarters.”

A B C and X Y Z of Bee Culture.—“All colonies should be gone over very carefully as soon as bees can fly.”

Required Stores.

L. L. Langstroth - Dadant.—“The bees should be provided with sufficient stores of honey, pollen, and water,” * * * “The best way to feed destitute colonies in spring is to give them combs of honey.”

Dr. C. C. Miller.—“Theoretically at least, I see that every colony as soon as it comes out of the cellar has plenty of stores to last it for some time.” * * * “for the ordinary colony, the equivalent of two full combs of stores.”

Dr. E. F. Phillips.—“Whether the bees have sufficient stores he can determine by lifting the hives.” * * * “If food is needed, it may be given rapidly in the form of a thick sugar syrup, or it is even better to give combs of honey.”

M. Quinby.—“Look well to any scarcity of honey that may occur, and supply all deficiencies by feeding.” * * * “If any are found destitute of sealed honey, supply them from such as have a surplus, or with combs reserved for the purpose.”

W. Z. Hutchinson.—“If the hives are well protected and the bees supplied with an abundance of sealed stores, natural brood-rearing will proceed with sufficient rapidity, early in the spring.”

E. W. Alexander.—“In the spring, if the bees have little or no honey they should be fed at once five or six barrels to prevent starving. This syrup should be about the consistency of good honey.”

A B C and X Y Z of Bee Culture.—“Unless they have two or three combs of honey, stores should be taken from some other colonies that can spare them. If no hives have the surplus, the needy should be fed a thick syrup consisting of two parts of sugar to one of water.”

The Need of Water in Spring.

L. L. Langstroth - Dadant.—“Apiarists in general do not attach enough importance to the necessity of furnishing water to bees in cold springs, in order that they may stay at home in quiet.” * * * “That bees can not raise much brood without water unless they have fresh-gathered honey, has been known from the time of Aristotle.”

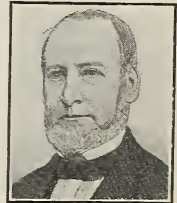
Dr. C. C. Miller.—“It is important to start the watering-place early in the season, before the bees make a start at some pump or other place where they will be troublesome.” * * * “(I use a half-barrel), put in as much water as you like, and on this put so much of the cork-chips that the water will barely come up enough for the bees to reach.”

Dr. E. F. Phillips.—“Bees need water for brood-rearing and it sometimes happens in the spring that bees are lost trying to obtain it. If there is no water close at hand, it is often advantageous to provide a watering place in a warm sheltered spot, or near the apiary.”

E. W. Alexander.—“They require water at that season as much as they do honey.” * * * “This syrup furnishes both food and water mixed together, which is very necessary to encourage early breeding.”



DR. E. F. PHILLIPS.



M. QUINBY.

A B C and X Y Z of Bee Culture.—“furnish bees water on the atmospheric principle.” * * * “When bees are compelled to go a distance for water they wear themselves out unnecessarily, and during chilly weather in the spring, they never get back.”

Contraction of Brood-chambers.

Langstroth-Dadant.—“When such desertion is feared,” * * * “the capacity of the hives” * * * “should be reduced to suit the size of the swarm, and increased cautiously, from time to time, when the bees seem to be crowded.”

Dr. E. F. Phillips.—“The brood-chamber may also be reduced to conserve the heat of the cluster.”

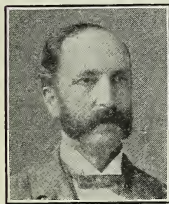
M. Quinby.—“Set aside such combs as are not occupied by the bees, leaving those that contain honey.”

A B C and X Y Z of Bee Culture.—“Unless the colony is very weak, take out the surplus of combs that it does not occupy or use, and crowd the little cluster on as few frames as it can occupy.”

Uniting Weak or Queenless Colonies.

Dr. C. C. Miller.—“very weak colonies in the spring.” * * * it seems no use to

unite them, for I have united five into one, and the united colony seemed to be no better than one left separate. About all that I try to do is to keep the queen alive until I find some queenless colony with which to unite them.” * * * “A safe way is to place one hive over the other with a common sheet of newspaper between.”



W. Z. HUTCHINSON.

Dr. E. F. Phillips.—“It is often advisable to unite the weak colonies with the medium or strong colonies,” * * * “a simple method of uniting consists in making the weak colony queenless and setting it over the colony with which it is to be united, with a single thickness of newspaper, slightly perforated in the center, between the two.”

M. Quinby.—“If colonies are found to be queenless, or possessing deficient queens, unite them with others having queens. It will often be judicious to unite weak colonies.”

E. W. Alexander.—“After the weak colonies have a little uncapped brood, set them on top of a strong colony with a queen-excluding honey-board between, and close all entrances except what they have thru the excluder. This we do about five days after they are taken from the cellar.” * * * “This is, without exception, the best and most practical way of caring for those little weak colonies in early spring that has ever been made public.”

A B C and X Y Z of Bee Culture.—“Where colonies are very weak it may be

advisable to unite; but this uniting, if the bees are in the cellar, should take place before they are set out.” * * * “Never unite two weak ones, but add a weak one to a medium, and thus make it strong.” * * * “moving the weak colony over to the strong one.”

Equalizing the Colonies.

L. L. Langstroth-Dadant.—“The apiarist will learn which colonies require aid, and which can lend a helping hand to others.”

Dr. C. C. Miller.—“Shall I take frames of brood from the strong colonies to give to the weak ones? Not I. For the damage to the strong colonies will more than overbalance the benefit to the weak ones. If any taking from one colony to give to another is done in the spring, it will be to take from the weak to give to those not so weak.” * * * “Not until a colony has six or eight frames of brood is it desirable to draw from it brood for weaker colonies, and there’s no hurry about it then.”

Dr. E. F. Phillips.—“If some hives contain more brood than the average, colonies may be equalized by taking combs of emerging brood with the adhering workers away from those abundantly supplied, giving them to weaker colonies, care being exercised not to transfer the queen. The weakest colonies in the apiary should be assisted in this way only after all the others are equalized;” * * * “Another method of equalizing is to shake the bees from the frames of a strong colony in front of the entrances of those to be helped.”

M. Quinby.—“When one hive has an oversupply of bees, and another a very fair, the next day after being set out, I change the weak one to the stand of the strong one,” * * * “cards of brood may often be taken from the best stocks and used to strengthen weaker ones to advantage.”

W. Z. Hutchinson.—“If the weak colony is to be strengthened by drawing upon the resources of the strong, I would prefer the plan given in Gleanings by J. L. Byer.” The plan referred to was to shake bees from a strong colony in front of the weak one. He also mentions changing places with weak and strong colonies.

E. W. Alexander.—“We also give them” (colonies with two-year-old queen) “frames of brood from other colonies.”

A B C and X Y Z of Bee Culture.—“The latter will be too strong and the weak too weak. Some have practiced exchanging places with the two colonies.” * * * “Colonies that are very strong in the spring will build up faster, relatively, than the weaker ones; and these can sometimes supply frames of hatching brood and bees to the stocks that are below par.”

Clipping Queens.

L. L. Langstroth-Dadant.—“This method will do, provided the apiary ground is bare, so that the queen runs no risk of getting lost in the grass. We abandoned it,

after having tried it for several years, but we know of some large apiarists who are successful with it."

Dr. C. C. Miller.—"For if a colony should have an unclipped queen there is a fair chance that it might swarm and decamp;" * * *

Dr. E. F. Phillips.—"The clipping of queens is advantageous in the control of swarms," * * *

M. Quinby.—"I am satisfied that I have had many fine queens superseded from the dissatisfaction of the bees with a queen with this imperfection. I do not imagine, however, that it is any real detriment to the value of the queen."

W. Z. Hutchinson.—"When swarming is allowed, I believe that the majority of advanced beekeepers now hive their swarms by having the queens' wings clipped, and allowing the bees to return to their old location," * * *

A B C and X Y Z of Bee Culture.—"The majority of honey-producers practice what is known as clipping;" * * * "There are very few who believe, or profess to believe that clipping is injurious to the queen."

Stimulative Feeding.

L. L. Langstroth - Dadant.—"To build up strong colonies by feeding requires more care and judgment than any other process in bee culture, and will rarely be required by those who have movable frame hives."

* * * "When bees first begin to fly in the spring, it is well to feed them a little, as a small addition to their hoard encourages the production of brood." * * * "Colonies which have abundant stores may be incited to breed by simply bruising the cappings of a part of their honey."

Dr. C. C. Miller.—"But it takes a good deal of wisdom to know at all times just how to manage stimulative feeding so as not to do harm instead of good; and I am not certain that I have the wisdom." * * * "If a colony comes out of the cellar strong, and with combs full of stores, I have some doubts if I can hasten its building up by anything I can do. So my feeding in the spring is to make sure they have abundant stores rather than for the stimulation of frequent giving."

Dr. E. F. Phillips.—"If a colony has wintered well, has a good queen, is in a large hive, abundantly supplied with stores, and is well protected from changes in temperature, it is doubtful whether it can be stimulated to much greater brood-rearing than these conditions will bring about. Even if stimulative feeding results in increased brood-rearing, as it may under some circumstances, the beekeeper may still find it to be unprofitable practice."

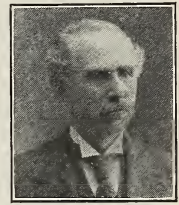
M. Quinby.—"Use honey or thick syrup." "Care should be taken not to give them too much." "Begin as soon as they will take it up in the spring, and continue in

accordance with the weather until white clover blossoms or swarms issue."

W. Z. Hutchinson.—"is now looked upon by many as of doubtful value;" * * * "The only time that spring feeding is advisable is where there is a dearth of nectar, after the early spring flow and before the coming of the main harvest."

E. W. Alexander.—"If made of one pound of sugar to three pounds of water, it gives the best results." * * * "Now, if you have done your duty by your bees since taking them from their winter quarters as I have recommended in the above, keeping them snug and warm, and feeding them a little thin syrup nearly every day for the first 30 days after they commence to fly, you can have two good strong colonies in the place of one, ready to commence work on your clover harvest," * * * "With us, spring feeding has been the means of our securing fully twice the amount of surplus honey from nearly every colony."

A B C and X Y Z of Bee Culture.—"Experience seems to show that spring feeding very often does more harm that good by over-stimulation." * * * "Many beekeepers of experience, especially in some localities, can doubtless practice spring feeding to advantage; but as a rule beginners will do better to give all their colonies enough in the fall."



E. W. ALEXANDER.

Spreading the Brood.

Dr. C. C. Miller.—"For some years I have been of the opinion that for me there is no time when it is profitable to spread brood."

Dr. E. F. Phillips.—"If the brood-cluster is divided and an empty comb is inserted, the bees will attempt to cover all the brood, and, in so doing, that part of the empty comb which intervenes will be kept warm enough so that the queen will lay eggs therein." * * * "This is attractive in theory, but in practice is attended with danger," * * * "The beginner should by all means leave the amount of brood to be determined by the bees." * * * "Stimulative feeding and spreading of brood should not be practiced early in the spring, but should be confined to a period of six or eight weeks just previous to the particular honey flow for which the beekeeper is building up his colonies."

M. Quinby.—"It is often best to place these" (empty combs) "in the center of the strong swarms, in such a position in the brood-nest that the queen will immediately occupy them."

Pollen Substitutes.

L. L. Langstroth - Dadant.—"Dzierzon, early in the spring, observed his bees bringing rye meal to their hives from a neighboring mill, before they could procure any

pollen from natural supplies. The hint was not lost; and it is now a common practice wherever beekeeping is extensively carried on." * * * "Shallow troughs or boxes are set not far from the apiaries, filled about 2 inches deep with finely ground, dry, unbolted, rye meal, oatmeal, or even with flour."

Dr. C. C. Miller.—"I hardly know which is best, and I have of late used principally corn and oats ground together," * * *

Dr. E. F. Phillips.—"It can scarcely be said that we know that the giving of substitutes for pollen is serviceable in brood-rearing," * * * "We are not justified in concluding that the giving of substitutes

for pollen is useless, however, and no harmful results are recorded from the practice."

M. Quinby.—"When practicable feed rye, ground very fine, and unbolted." * * * "It should be remembered that flour feed is only advantageous in the earliest part of the season."

E. W. Alexander.—"Years ago we set out our bees much earlier than we do now, and we frequently gave them rye meal to work on as a substitute for early pollen. This practice caused them to leave their hives in search of flowers many days when the air was too cold for them to fly in the shade, and so we discontinued it some time ago."



THE first of April is a significant date, for our location, for it marks approximately the date for the beginning of the critical brood-rearing period of spring, the period during which the workers for the harvest are reared. Our honey flow may begin about the first of June. It does not always do so but often enough so that we can not afford to fail to have the bees ready at that time, and we need about two months of constantly increasing brood-rearing to get ready for it. Fortunately, in our locality (the clover region), the honey flow comes about two months after the bees naturally begin brood-rearing in earnest. The workers for the harvest, therefore, are produced largely during the time the colonies are most willing to co-operate by rearing the greatest amount of brood, in proportion to their population, of any similar period during the year.

Workers for the Harvest Should be Young.

Brood-rearing usually begins moderately in April, and, unless something happens to prevent, increases steadily until the first of June or later, so that if there is time enough brood-rearing reaches its maximum about the beginning of the honey flow. This makes the vast majority of the bees in the hives on June first quite young or from brood reared during the month of May. It is fortunate that the bees do it this way instead of the other way around, even if they could do it that way, for if many bees were reared in April and few in May, we might have colonies of the same strength so far as numbers are concerned but greatly inferior in ability to gather and store a good crop of honey.

We have had many colonies that forged ahead in brood-rearing during April but failed to keep the pace during May on ac-

WORKERS FOR THE HARVEST

Colonies Should be Built up Promptly and Quickly for the Honey Flow Instead of on the Honey Flow

By Belva M. Demuth

count of a failing queen or a shortage of stores. In every case, so far as we know, these colonies, in proportion to their population, have done the poorest

work during the honey flow, presumably on account of the greater age of the workers. We have made up colonies at the beginning of the honey flow entirely of field bees, uniting the field force from each of several colonies for this purpose, and at the same time made up colonies of equal numerical strength but composed entirely of young bees. In every case the difference in the amount of honey stored by the two sets of colonies was overwhelmingly in favor of those made up of young bees.

What Constitutes Strong Colonies.

When we speak of the strength of colonies we usually mean the number of bees, without reference to the difference in the strength and endurance of the individuals, due to their age. Dr. Miller recently used an apt expression to bring out this distinction when he said, "Strong colonies of strong bees." For best results with our short honey flow it is necessary not only that each colony be built up to its greatest possible numerical strength by the time the honey flow begins, but also that this building up be done so quickly that most of this great horde of workers shall be young bees, recently emerged, ready to go into the fray while in possession of the full vigor of their youth.

We are accustomed to thinking of these bees, reared at this time, as a special honey-gathering crew whose purpose in life is totally different from all the other bees reared during the year, for with our conditions all the bees reared at other times can be useful only in the maintenance of the normal strength and prosperity of the colony until

the arrival of the time for another supreme effort next year in the rearing of the crew of workers for the harvest. A longer honey flow would of course modify this view. This gives to the brood-rearing period of April and May, especially the latter month, an importance far greater than that of any other similar period during the year, for all other brood-rearing, so far as we are concerned, exists for the sake of the brood-rearing during the eight weeks just preceding the main honey flow.

What If Locality Affords More Than Two Months of Extensive Brood-rearing Previous to the Honey Flow?

We are sometimes inclined to envy those who have a longer time between the beginning of brood-rearing in the spring and the main honey flow than our locality affords, yet such a condition would probably not give so large a proportion of young bees at the beginning of the honey flow and would result in some of the early reared workers not being utilized to best advantage. I can see how colonies might be built up strong enough to divide six or eight weeks before a later honey flow, if the main honey flow should come so late that this could be done, then both colonies encouraged to multiply quickly their numbers fivefold before the honey flow begins. Whatever the date for the beginning of the main honey flow we can not afford to have even the slightest interference with brood-rearing during the preceding six or eight weeks.

Spring Manipulations.

We find ourselves handling the bees less and less during the spring, as the years go by. The colonies wintered outdoors are not unpacked until about the last week in May. If queenless colonies are found earlier, they are united with colonies whose population is below the capacity of the queen. If there are any very weak ones, no attention is paid to them except to try to find the cause of weakness in order to avoid such colonies in the future, for we have never found it profitable to spend time nursing along very weak colonies in the spring. We have been thru the mill of stimulative feeding, spreading brood, and other early spring nursing, and doubt if any of this has ever been profitable. We simply try to see that every colony has what it needs for best development at this time and then leave them alone. If they have good vigorous queens and are normal as to number and vitality of workers the first of April, there are but few things that can happen during April and May to prevent rousing colonies by the first of June. These few things, however, are extremely important, since any one of them may cause good colonies to drop out of the race just before reaching the goal toward which we have been working since last August. Among the dangers that threaten the colonies at this time are a failure of or some accident to the queen, insufficient

room for brood-rearing to the greatest capacity, and insufficient stores (either from the fields, feeders, or stored in the hives) to stimulate unrestricted brood-rearing.

More Room Needed for Brood-rearing.

Well-wintered colonies of normal strength and conditions usually, sometime in May, need more room for brood-rearing than that afforded by a single brood-chamber of 10-frame Langstroth capacity, especially if the single brood-chamber must contain both the stores needed at this time and the brood-rearing space. We have added to the equipment of each colony an extra brood-chamber to give room for the greatest possible development of each colony previous to the honey flow. This adds considerably to the cost of a comb-honey equipment, but with our conditions it also adds handsomely to the season's profits. Besides acting as a safety valve for the expanding brood-nest this extra brood-chamber when supplied with five or six frames of honey makes one of the best feeders to stimulate brood-rearing I have ever seen.

Importance of Abundance of Stores.

One of the hardest things we have had to learn is the large amount of stores needed for this heavy brood-rearing. When the bees have no opportunity to gather from the fields because of cold or wet weather the honey stored in the hives disappears with surprising rapidity. From some experiments which he conducted some years ago, R. L. Taylor concluded that it requires about a frame of honey to produce a frame of brood. It is difficult to realize that the 10 to 12 or more frames of brood which we hope to have in the hives on June first will cost the equivalent of as many frames of honey, yet many times we have seen several frames of sealed honey disappear during cold rainy weather in May, and brood appear in its place. We occasionally have a good honey flow from apple blossoms and have had the second story filled with honey from this source, but instead of being able to extract a crop of apple-blossom honey we have had to be content to see most of it disappear and frames of brood take the place of the frames of honey. Whenever this has occurred in our apiaries, all colonies that were at all well wintered have produced a fair crop of honey even during the poorest seasons and bumper crops in good seasons.

"Strong colonies of strong bees" (strong for the season) on April first, to which are added more stores than they can possibly use and more vacant cells for brood-rearing than they can fill, make a combination that practically insures a fivefold increase in population, by June first. The miracle of large increase is worked in the months of April and May—more in May than in April. Then, with strong colonies an accomplished fact, the mighty hordes of workers for the harvest leap into being at the very nick of time FOR the honey flow, instead of building up later ON the honey flow.



ANNE LESTER AND DADDY LOWE, BEEKEEPERS



By Grace Allen—Chapter III

ONE morning Mr. and Mrs. Lowe and Anne Lester stepped out on the side porch after breakfast, and stood looking a few minutes at the beauty of the April morning.

"It feels like Sunday," Anne remarked.

"That's because we had waffles for breakfast," smiled Mrs. Lowe.

"Maybe so. I never had them at home except on Sunday. And then the orchard is so dressed-up and blossomy—and so quiet, as if everything was waiting for the sermon."

"Or the benediction," Mrs. Lowe added softly.

Anne turned swiftly. "Don't you love the benediction better than any other part of church? It's so—so sort of—"

"Holy," finished Mrs. Lowe simply.

Anne nodded. It was very quiet for a few minutes. Then the girl started down the steps, calling Shep.

"I've just got to get out into this," she declared. "Shep, race me to the orchard!"

Off they ran. When they came loitering back half an hour later, Anne was bearing boughs of apple bloom.

"What did you find in the orchard, Anne?" asked Daddy Lowe.

"These," Anne answered, laying the blossomy branches in Mother Lowe's lap, and sitting on the step near her rocker; "with bees humming in them till the trees sounded like giant cats purring in the sun. It's a thrilly morning."

"Shep," warned Mother Lowe, "don't you go getting temperamental, and start chasing purring trees!"

Anne laughed. Then Daddy Lowe rose. "I'm going into the bees today. Anybody going along?"

"Yes, and can't I really help?" Anne asked.

"Not much at first. But you can learn."

"You see, if I'd stayed in town, I'd have been deep in Red Cross work and other war work. I've got to do something that counts. If I can help produce some honey, that will be very much worth while. Of course, now that I've learned to knit"—laying a grateful hand on Mrs. Lowe's knee—"I expect to do a lot of that, too, but—"

"Don't you stay indoors, child, and settle down to knitting mornings like this," Mrs. Lowe interrupted. "Go on out and fuss with the bees."

A little later Daddy Lowe and Anne were in the shop at the edge of the bee-yard. "Put on one of these veils," he directed.

He lighted the smoker, in which Anne was much interested. Then he brought out two hive-seats.

"Such handy little seats," Anne approved, "with places to put things on each side."

A few deft, strong motions with the hive-tool, and Daddy Lowe had raised a super enough to puff a bit of smoke in gently. Then he set the super off. Anne drew a quick breath. "Is that all bees?" she demanded, awed, looking in the open hive.

"Bees and combs and honey and pollen and brood and—"

"Thanks. Just which is which?"

Daddy Lowe loosened the comb nearest his side and drew it out, dry and empty. "Sometimes I start removing combs from one place and sometimes from another," he remarked. "I could see there were no bees over here, so it was easy to take this one out first, and give more room to work with the others. This, then, is merely empty comb, such as you have already seen in the shop."

Loosening the other combs, he crowded part of them over towards the empty space, and gently lifted one from near the center. It was covered with bees crawling apparently aimlessly over its surface.

"Laying queen, all right," he announced with satisfaction.

"Where?" with some excitement.

"Not on this comb. I haven't seen her, but there must be one, because—look."

Then he showed her the hope of the hive, the brood, the wonderful early stages of bee life.

"Oh, I can't see the woods for the trees!" she wailed despairingly. "I can never learn about bees where there are so many of them."

"Don't call this a lot," he admonished. "Wait till summer, when there really are some." He gave the comb a quick shake, and off dropped most of the bees. Then he handed it over to the girl.

"Now!" she exulted.

"Can you see the eggs?" he asked. She could not. So he went round to her side, tipping the comb so that the light struck into the cells where the fairy-like eggs lay.

"You mean those tiny white curvy things?" she queried incredulously. "Those? Are they dreaming there of wings, those little wee specks? They really think they'll get them?"

"The wonder of it is they'll get them without thinking about it at all. The scientists would object mightily to your putting a dream inside one of them!"

"I didn't put it. God did. Else the wings would never grow. And no doubt can shoot it away. It mayn't be like what we call dreams, but it's there, something that urges and reaches out and grows and started with the beginnings of things. Assuming, of course, that these really are eggs."

"They really are eggs. Look further and you'll see the larva."

"The worms—oh, yes! The little old fat things! Aren't they roly-poly? Here are

some right little ones, tho—evidently just hatched out. But isn't it too bad to have to be a worm in order to get wings, and fly?"

Daddy Lowe smiled. "Sometime we'll talk that out," he promised. "But now let's finish with this comb, so we can go on with our work. Inside the cells that are sealed with the brown coarse covering, the worms are getting their wings. The cells around the top, with a lighter seal, contain honey."

Anne was so interested that she yielded the comb reluctantly. But when Daddy Lowe, drawing out another, announced the queen on it, she fluttered over to his side, all excitement.

"You beauty!" was all she said, "You slim golden beauty!"

"Do you see that the wings on one side are clipped off?" the man asked.

"Sure enough," she agreed; "Why?"

"To keep her from flying away with a swarm. And that keeps the swarm from flying off, for they won't go without their queen."

One after another the combs were examined, Daddy Lowe marking down in a record book the estimated amount of stores and brood on hand—or food and babies, as Anne said. "When I find about how the different colonies are running," he explained, "I shall probably take some honey and some brood away from part of them to give to those a little backward."

In another hive he pointed out the pollen cells, packed with their hard, dry, varicolored treasure. "And you've seen the bees coming in loaded with pollen, haven't you? They're bringing in a lot today."

"You mean those bright balls sticking on their legs? Yes, I was going to ask you about them. Is that pollen?"

"Yes, that's pollen. They gather it from different flowers and pack it into their pollen baskets, an arrangement of hairs on the back legs, and bring it home."

In still another hive an unclipped queen was found. "Superseded," remarked Daddy Lowe, "that is, the bees raised a young queen and made way somehow with their old one. My record shows the other to have been clipped. And soon it will show this one clipped."

Deftly he picked up the royal lady by her wing, quickly putting the tip of the first finger of his left hand under her; and when the little feet grasped the finger, the thumb closed gently but tightly upon them, holding her fast, even after her wings were released. Then with the free right hand, he picked up his scissors and skillfully cut off the wings on one side. Anne let go her breath.

"That looks like a delicate operation," she said appreciatively, "and delicately done. I'd likely kill her."

"Hardly that, but you might injure her the first trial. Sometime you shall experiment with a drone. They're not so precious as queens."

"What a good idea! And now, Daddy Lowe, you've told me a lot and shown me more, and I am most grateful. But I know I'm bothering. So please go on and don't pay any more attention to me. I'll stay and watch, but I'll keep my questions till later. It'll mean a lot to me to see just how you do when you're not being interrupted."

Daddy Lowe took her at her word. Hive after hive he opened and looked thru, the girl sitting opposite him, watching closely but seldom speaking. Finally, however, she failed to follow, as he moved on to other hives. Quietly, veil turned back, she sat watching the bees drop in from their flights, heavy with their precious treasure brought from afar. Their rapturous humming moved her deeply. Some of them, she knew, were bringing in nectar, tho it was nowise to be seen. Others came careening under great burdensome balls of the gay dust of flowers. "I believe you're bringing home the rainbow," she said softly, "violet, indigo, blue, green, yellow, orange, red. No wonder you sing as you come."

"Daddy Lowe," she called presently, "I'm going over to the hill and watch the orchards bloom."

"Tell them for me you're a good watcher, and no trouble. Better take Shep along."

Anne laughed and called the dog. From the side of the hill Mr. Lowe's modest orchard stretched out to meet his wealthy neighbor's extensive one. Anne looked down on the April beauty as on Fairyland itself. All the thrill and youth of the spring was reflected in the eager face. But gradually the glow died away, and the young eyes grew sad.

"It's not like this over there," she thought, seeing the orchard thru a sudden blur. "It's April, but it isn't like this. Boys are dying. They are killing each other. Oh, Robert, my brother Robert, how about you?"

Then quite suddenly, a great sob broke thru, and Anne dropped in a little heap on the side of the hill and cried like a child. She was not given to crying, but she was very young and the world's tragedy and sadness overwhelmed her.

"Shep," she said gravely as she rose a little later, "please don't think I'm a cry baby. I'm going home to Mother Lowe. She's little and old and as frail as an apple blossom, but I believe she's stronger and braver than I. I can beat you to the mulberry tree, tho, and don't mind proving it. Come on!"

And with a smile resolutely shining thru the tears, she dashed home with Shep. Entering the yard, she saw Daddy Lowe talking with a young man whose face was turned away from her direction. Shep started over to investigate. Anne did not. "Theodore Robinson!" she gasped, and fled into the house.

"Mrs. Lowe!" she called, "where are you? I've come in to knit."

(To be Continued.)



BIG BEEKEEPING POSSIBILITIES

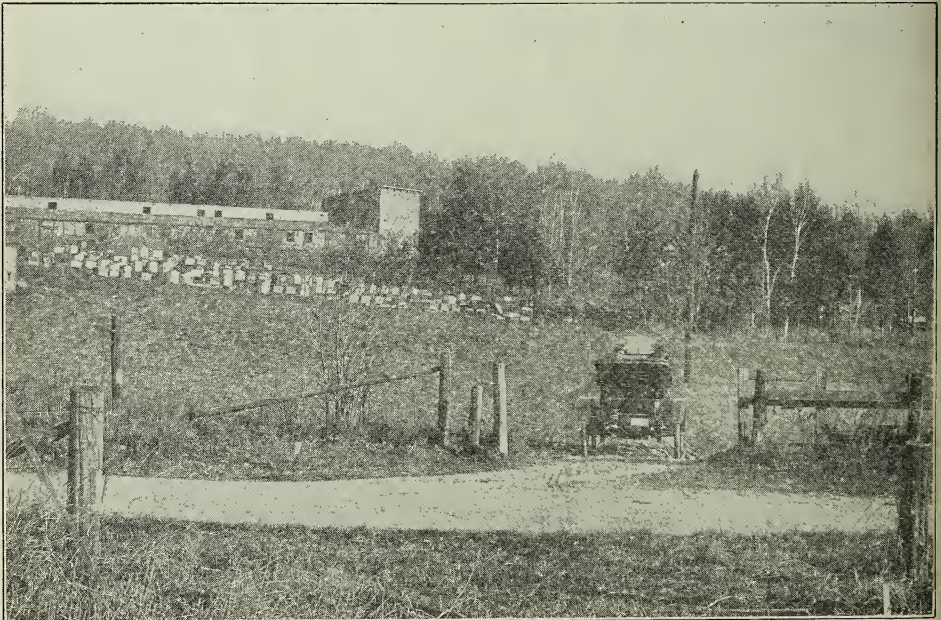
In the Extensive Region of the Upper Peninsula of Michigan

As a result of many inquiries received during the past two years I submit the following information which I gained thru a personal visit to the Upper Peninsula of Michigan during the summer of 1918.

Alsike clover grows in great abundance in all parts, whether wooded or cleared, excepting on the sand plains and some of the very rocky hills. Any one who has never seen alsike growing in Cloverland would hardly believe a statement of the prolificness and abundance of this very valuable honey plant. This is by far the most valuable source of nectar in Upper Michigan. Fireweed, or epilobium, grows in profusion in the districts where fire has burned off the other herbage within one or two years. This plant furnishes a heavy secretion which makes one of the finest of honeys, but it is not dependable. It becomes crowded out within a few years after a fire has covered the territory. Red raspberry grows in abundance on the uncultivated hardwood land. This plant furnishes a quite dependable source of nectar and is only second in importance to alsike clover. Basswood has been a common tree, but in most sections

it has been lumbered off until it is of small relative importance. There are, however, some locations where basswood forms one of the chief sources of nectar. It is not dependable from year to year, but furnishes a very heavy flow occasionally. Goldenrod grows principally on the heavy land, but is also found to a certain extent along the edges of the sand plains. In seasons when the temperature and moisture are favorable it is an important source of fall honey. Aster is scattered over most of the territory and, true to its characteristics in the North, yields a very late flow which is not usually ripened and which granulates in the comb. Other minor sources of nectar are wild cherry, dandelion, boneset, sweet clover, Canada thistle, hard and soft maples. Those plants which grow in the sun naturally yield nectar first, while those which grow in the shade furnish a later flow. The main honey flow begins about the last week in June and continues thru the blooming of red raspberry, alsike, and fireweed. This usually covers a period of about six weeks.

One peculiarity of the Upper Peninsula which appeals to most beekeepers is the absence of drought. The records of the weather bureau for years back show that rain falls with surprising consistency during the summer months. The daytime temperature during the period of nectar secretion is usu-



A typical apiary in the Northern Peninsula of Michigan, located at Iron Mountain, Dickinson County.

FROM THE FIELD OF EXPERIENCE

ally warm, but rarely hot. One can wear a light coat with comfort all thru the summer. The nights are usually cool and sometimes quite cold. For this reason the writer does not expect that this region will become famous in the production of comb honey. Light frosts are expected in some parts during each month of the summer. These frosts, however, are not usually so severe as to interfere with nectar secretion.

The soil on which the nectar-secreting flowers grow is chiefly clay, much of this being of a reddish color. The glaciers, which once covered this region, left numerous deposits of clay separated by plains of sand. The sand plains are of no value to the beekeeper. There are several ridges of high and rocky hills, and in this territory it is not believed that commercial honey production would be profitable. Most of the soil, however, lies in level or gently rolling areas.

The rural population is such as would naturally be found in a new country. Farm homes are generally few and scattered, as one recedes from the larger cities. Around the cities the population is as dense and the land as well tilled as in our older com-



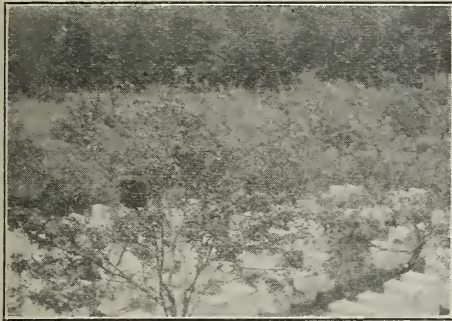
Volunteer alsike on cut-over land.

in the loose snow to furnish oxygen for the needs of the bees. However, there comes an occasional winter when there is very little snow and when the temperature may go even to 35 below zero and then few bees survive. Judging from what could be learned from the beekeepers regarding their experience, the wintering of bees in a properly constructed cellar or in tenement packing cases brings results that are entirely satisfactory.

The roads between the various cities are generally good. There are hundreds of miles of the finest macadam and pavement. Within a very short time it will be possible to travel between all of the county-seat towns on some of the finest roads in America.

The markets for honey naturally are very good, as up to the present time not sufficient honey has been produced to satisfy local demands.

Anyone interested in this territory should write to the county agricultural agents whose addresses are as follows: For Chippewa County, County Agrl. Agent, Sault Ste. Marie, Mich.; for Luce County, County Agrl. Agent, Newberry, Mich.; for Dickenson County, County Agrl. Agent, Iron Mountain, Mich.; for Ontonagon County, County Agrl. Agent, Ontonagon, Mich.; for Houghton County, County Agrl. Agent, Houghton,



Bee-yard located in a young Orchard in Chippewa County.

munities. The people have gone there not only from all parts of the United States, but a large proportion were born in foreign countries, including Norway, Sweden, Russia, Germany, and other parts of Europe. Good schools and churches are available and the people are in many ways more enterprising than in older communities.

Bees are wintered in the same manner as in southern Michigan. Some use single-wall hives and allow the bees to remain on their summer stands thruout the winter. Others use double-wall hives, some use special packing cases and some winter in the cellar. Bees winter more successfully without protection than they do in central and southern Michigan. This is because the snows come early before the ground has had an opportunity to freeze. One snow follows another until the hives may be buried under from four to eight feet of snow. There is sufficient air



Field of Fireweed.

FROM THE FIELD OF EXPERIENCE



Alsike clover and raspberry.

Mich.; for Menominee County, County Agrl. Agent, Menominee, Mich.; for Iron County, County Agrl. Agent, Crystal Falls, Mich.; for Gogebie County, County Agrl. Agent, Ironwood, Mich.; for Baraga County, County Agrl. Agent, L'Anse, Mich.; for Alger County, County Agrl. Agent, Munising, Mich.

B. F. Kindig.

East Lansing, Mich.

[Our cover picture shows a typical scene in the Northern Peninsula before the timber has been cut off.—Editor.]



WHAT ONE MISTAKE DID

A Bee Escape That Didn't Work Well as a Bee Confiner—Then Trouble

"No, I'm disappointed in Kipling nowadays. He should have written a much better story about bees; and it's not particularly funny either!"

Thus spoke the writer after reading a short story by Kipling called "The Vortex," dealing with the terrorization of an English village by two angry swarms of bees which had broken out of their hives in an accident while being moved. This at ten o'clock in the morning just (as fate would have it) before beginning maneuvers with my own bees. It is now two o'clock, and the odor of witch hazel pervades the atmosphere.

I am an enthusiastic beekeeper of the gentler sex, and wish very much to take off a little surplus honey to eat and sell; so, all the big honey flows being over in this neighborhood till the fall flow from goldenrod and aster, I was inspired with the very brilliant idea of transporting a hive of bees to the edge of a large pond six miles away, which is surrounded with quantities of clethra—that fragrant blossoming shrub known by some as spice brush—which is now in full bloom. I thought that I, altho the owner of only six hives, could have my little experimentation on a small and modest scale. It was an experiment in very truth, but far from small and modest! Selecting

the hive, I put wire netting over all the entrance but a small place in which I stuck a Porter bee-escape, that the field bees might get back in their hive again. The bee-escape is an invaluable little invention made with two steel springs thru which the bees can get out but not crawl back again. In this instance I reversed it so that the bees could get into the hive but not come out. Then strong cleats were put on, to hold the hive-body and bottom-board together, and the cover nailed down. After all but a dozen field bees were in I put the hive in the back of my buggy and started off in a hurry to get my sister-in-law and take her to the train on my way to the pond. As I neared her house (a quarter of a mile away) I noticed some bees flying about the back of the buggy, but supposed they were some of the field bees which were persistently following their peripatetic home. When I stopped, quite a bevy surrounded us; and my sister, who was about to get in, waved her parasol frantically about, performed some odd gyrations, and dashed into the house.

"Hurry up and get in," I shouted. "They're all right, only hurry up. They're not stinging me, you see."

"Darn it," she answered, most profanely, "I don't care whether they're stinging you or not. They're stinging me."

I waited no longer, but, touching the horse, trotted down the road at a good swift pace, thinking to out-distance the pursuers; but, not at all. More and more came, and then came the stings. I looked back, and a stream of living javelins were issuing from the hive, burying their weapons in the back of my neck, and occasionally darting on to stab the horse's flanks or quarters. The Porter bee-escape had worked loose. What should I do? I could not stop and plug up the entrance; for when I slackened speed the attacking forces were overpowering. Many tales had I heard of plunging horses being stung to death by infuriated bees, and I wanted no such experience for the horse or myself either. Without stopping at all I leaned over and jerked a light carriage robe over the hive as well as I could. Tho not absolutely efficient it helped a good deal. On we raced, the bees tearing after—occasionally a muttered word and a vicious slap in the hair at the back of my neck, or a sting scraped from my wrist. At irregular but frequent intervals the horse would suddenly bound ahead at amazing spurts of speed. But ever, like evil demons, were those creatures behind and around us. I knew we must keep going or the horse would be stung to death. The Lord only knew how it would end, anyhow. We met an acquaintance who smiled and bowed pleasantly. There was no use of warning her, for the evil had been done; so I also bowed and smiled, and wondered how long she

FROM THE FIELD OF EXPERIENCE

would look and feel that way. Somehow I felt that if I could only get home the horse could be put under cover and I could "lie low" myself. At last I found a place to turn, in a neighbor's driveway. We galloped around the circle and finally headed home. Only ten minutes more of agony. Luckily a man was drinking water at the roadside pump in front of the stable. I screamed at him long before he could possibly hear me. Finally he heard, but seemed unusually slow of comprehension. But when we stopped he rushed up with a blanket to cover the now plunging horse, and I must admit I have never seen a horse unharnessed faster in my life. Into the stable we rushed, all three, closing the door and windows tight. Oh, what a blessed haven of refuge that dark stable seemed! Nerves had been stretched so tight that another instant with those "most marvelous and extraordinary little creatures" and the nerves would have snapped completely. Peeking out thru the stable window I saw what was to me now a most amusing series of moving pictures. First came the butcher's boy, feet on dasher, cigarette between teeth, jogging placidly along with an old and faithful horse; but on drawing even with the deserted buggy with its vicious load, what a transformation scene took place, my friends. From his mouth flew the cigarette, from the dasher his feet. For a moment hands were busy slapping and tearing the air; then old Dobbin felt the whip descend on his fat flanks as never before. In a cloud of dust and bees they disappeared. My little nephew coming up the road suddenly clapped his hand on his eye and ran for home, yelling lustily all the while. Then the men in the garden dropped their hoes and took to their heels, pulling out much hair on the way to the barn. Soon the place was deserted, and *Apis Mellifica* reigned supreme.

How I restored the bees to their original hearthstone without loss of life or anything more valuable than temper, which I do not in the least mean to underrate, would make another story.

But now as I sit, hand-glass in hand, gazing mournfully over my shoulder at the reflection of thirty-eight bee-stings on the back of my neck, I remark critically and with great decision, "That story of Kipling's is not so bad after all."

Josephine Morse.

South Lancaster, Mass.



IT WORKS VERY SATISFACTORILY

A New Way of Fastening Foundation in Frames That Does the Business

During the past two seasons I have used a method of fastening foundation in brood- and extracting-frames that I think is very

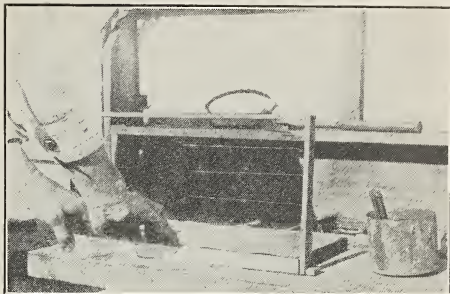


Fig. 1.—Stick the sheet of foundation to the top-bar by using the fingers.

much better than any other method in vogue. I like it so well that I think every beekeeper ought to know about it. It saves time and makes a better job than any wedge method whether driven in a groove or nailed. Also it eliminates the necessity of making any cuts or grooves in the top-bar of the frame, thus making it simpler to make and stronger and better to nail to.

Fig. 1 shows the first operation. I stand the frame up on the top-bar as shown and just back of it lies an imbedding board exactly the thickness of the top-bar of the frame. I lay a sheet of foundation on this board, then slide it towards me until it is

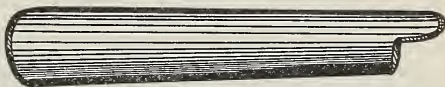


Fig. 2.—The rounded stick, notched at the end, used to rub the foundation fast to the top-bar.

just flush with the edge of the top-bar nearest me. Then I press it on to the wood with the tips of my fingers as shown. By using all the fingers of both hands for this work it is very quickly done. The foundation should be soft enough to stick to the wood when pressed firmly with the fingers.

It is now ready for the second operation, which is done with a specially shaped stick

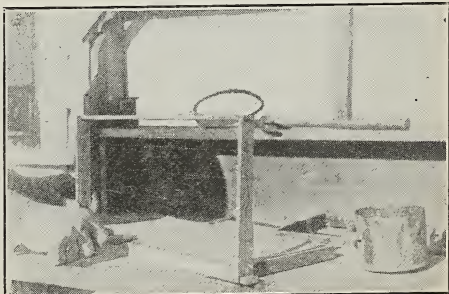


Fig. 3.—Showing the work of rubbing the foundation firmly onto the frame.

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as shown in Fig. 3. The stick is made out of a piece of hardwood about five or six inches long and about three-fourths of an inch in diameter and looks like the drawing in Fig. 2. The notch in the end of the stick should be about one-fourth of an inch deep and as long as half the width of the top-bar you are using. This notch should also be polished smooth. The second operation consists simply in rubbing the foundation fast to the top-bar with the above-mentioned stick; and to keep the stick from sticking to the foundation I keep it in a small can of water standing near me, as shown in Fig. 1. When the foundation is soft enough to work well it can be rubbed on to the frame in this manner so firmly that it will never fall off. I have hauled several boxes of foundation thus fastened 20 miles over rough roads in a hard-riding truck with solid rear tires and never had a sheet fall.

After the foundation is fastened it is a simple matter to tip the frame over on the imbedding board and imbed it. Also, if you use a spur-wheel imbedder, the rubbing stick can be made on the handle of it, and you have the whole outfit in one tool. After a few trials you will find this method easily twice as fast as any wedge or waxing method and a far better job when done. Another advantage is that if an occasional sheet should come loose (which is very rare), it

can be easily refastened by rubbing it with your hive-tool.

I did not originate this method, but it was shown me by a beekeeper from Texas, and he claimed it was used considerably there.
Joseph H. Peterson.

Garland, Utah.

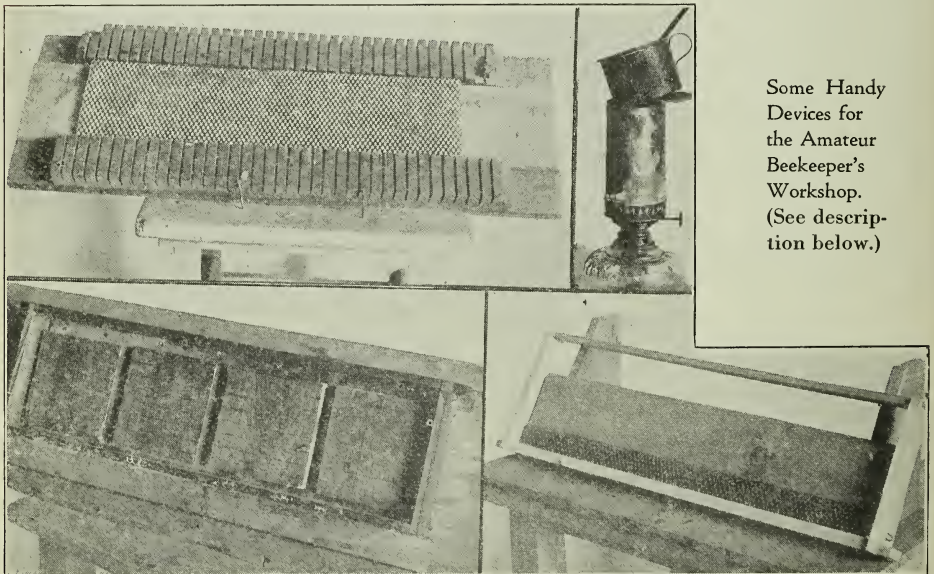


THE N. Y. STATE SHORT COURSE

The Kind of Instruction that is of Great Value to Commercial Beekeepers

I attended the commercial beekeepers' course held at Cornell University, Ithaca, N. Y., the last week in February, with the special object of getting, if possible, some information from Dr. E. F. Phillips concerning the "disappearing disease," in his discussion of "Diagnosis and Treatment of Bee Diseases." But I got nothing new. However, I stumbled—yes, stumbled—upon a course of lectures which well repaid me for my trip. In fact, I would not care to place a money value upon the information secured.

The line of talk given is on a higher level than any other bee-talks I ever heard. It went down to foundation truths, giving the result of carefully conducted experiments after carefully thought-out plans, which left



Some Handy Devices for the Amateur Beekeeper's Workshop. (See description below.)

In the upper left-hand corner is the picture of a device for cutting super foundation for sections of any size. At the upper right-hand corner is a tin can with top and bottom removed and used as a chimney for an ordinary lamp and also for holding the cup in which wax is heated. The lower left-hand corner shows a device for putting foundation in four sections, with wax and brush. The remaining illustration is a rack for holding shallow frames when putting in foundation.



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the doubter no ground upon which to stand. For instance, I found out that as long as a colony had enough empty cells in the combs to accommodate a cluster one could not give too much winter stores; and I had it brought home to me as never before that perhaps I have been too stingy about giving colonies plenty of stores to be turned by them into young bees. Again, they pretty well demonstrated that even I should pay more attention to requeening colonies; also that the 12-frame Langstroth hive is not too large for a young queen, but too small. Again, it was brought out very clearly that in the vast majority of cases a colony did not reach the peak of its strength when the surplus-honey flow started, but after—this being a loss in honey production.

G. S. Demuth gave valuable addresses right thru. Geo. H. Rea, who has been connected with the extension work at Washington, gave the best method of queen-rearing, on which those present took careful notes.

There were at least 137 students, among them extensive and well-known beekeepers. Ninety-three of them produced nearly 900,000 pounds of honey last year. This was compiled from records sent in without names so no one would be disposed to exaggerate.

C. P. Dadant, Hamilton, Ill., gave "The Dadant System" of honey production; and so convincing were his arguments for a deeper frame for the brood-chamber, and a larger brood-chamber, that the writer of this article, altho previously considering himself a large-brood-chamber beekeeper, felt that he had erred on the small side. Many others received the same impression; and should this educational work continue, as, in the interests of beekeeping, it is to be hoped it will, we may expect a breakaway to that system by men who want to reduce the cost of honey production.

The writer would strongly recommend to any one wanting up-to-date information in beekeeping not to hesitate to go hundreds of miles to attend such lectures.

R. F. Holtermann.

Brantford, Ont.



HIS START WITH BEES

Some Quite Lively Times Around This Amateur Beekeeper's Home

On Feb. 10, 1918, I went to a public sale, where they put up two stands of bees in homemade hives, but in fairly good condition. I had no more idea of buying them than I have of buying German war bonds; but a friend of mine said to me, "You have had everything from cows down to white mice; now why not buy the bees?"

I said to him: "Gee, Bill, they would sting me."

He said: "No, they won't. I had bees for five years till my wife made me get rid of them. You can make some money with them too, and I will show you how."

Well, I bought them, giving \$8.00 for the one stand, and took them home with me in a closed wagon. On the way the jolting of the wagon caused the bees to come out and look around. Bill put one on his hand and wanted to allow it to crawl on my hand; but there was absolutely nothing doing. Still, it put more confidence in me; and with a little coaching on his part everything went along lovely until in March when I placed them just next to my barn. One day, a little later, I was plowing, and stopped my horses near the stand; but, believe me, the bees made the horses move. One of them was covered with bees; a few stung me, but it did not swell any. Say—I got the horse into the barn and made straight for the grocery for a quart of gasoline. When I got back with it Bill said: "What are you going to do?"

"I am going to get rid of those bees," I answered, and added some very beautiful adjectives. Bill said, "Now just set that can down and listen to me."

I did so, and he said the whole trouble was my own fault in leaving the horses standing so close to the hive that they got to jerking and shaking their heads every time a bee went past, until the little bees thought the horses were after them, and they went to work to defend their home. Well, from that time on I had bees in my bonnet, bees in my clothes, and, in fact, all over me, yet I have not felt many stings.

Some time in June the bees swarmed, and I hived them all alone. I also bought a stand from a friend, caught a swarm, found a swarm, and my first colony threw off another swarm in July, which I hived. By this time I had been from one end of the hive to the other—knew all about different kinds of bees and queens, and became so much interested in them that my wife said I had bee-mare instead of nightmare. She claimed I took all of the drawers out of the dresser one night hunting for the queen.

This year I had an average of 60 pounds of honey from my five stands of bees, and a beeman said there was at least 75 or 80 pounds of honey in the brood-frames, because some of the hives were very heavy. I left all of my colonies outdoors all winter. I have a fence on the north, and I put a roof over the top of the colonies, so they would be protected all around. My wife was afraid of them at first, but now she goes right up to the hives. We eat on an average three pounds of honey-a week, and are using it instead of sugar.

Many people try to discourage me in keeping bees; but after looking at the places in which they themselves kept bees,




FROM THE FIELD OF EXPERIENCE



and the hive they used, it is no wonder they think it unprofitable. Such dirty, unkempt hives, homemade hives, with any kind of top, and slats for a foundation! I really believe the bees died or abandoned these, simply from discouragement. Why shouldn't they?

H. R. Payne.

Springfield, O.



THE TWO-POUND PACKAGE

The Reason for and the Result of Long-distance Purchases of Bees

Having had a few years' experience in caring for bees, during which time I read considerable of the best literature on the subject, and being desirous of increasing the size of my apiary and its output and getting some valuable experience and firsthand information along a comparatively new line, I decided early in 1918 to order some bees from the South in combless packages. As the two-pound package was the smallest that seemed at all advisable, I decided to conduct my experiments with it.

The next question was when to have them shipped, and I studied my memorandum for 1917, which said that on Mar. 20 bees were working industriously on soft-maple buds along the river bottoms. By Apr. 15 they were busy on the cottonwood and a week later on the ash and box elder. Very soon after this apple, plum, and other fruits began to furnish pollen and nectar, so I decided to place my order for just as early shipment as the breeder could get them out, which promised to be near Apr. 15. I placed two small orders with Alabama men for shipment on Apr. 15 and one order with a Texas man, who promised to start the shipment about Apr. 20. One shipment of four two-pound packages with untested queens arrived from Alabama Apr. 22 and the bees were hived in 8-frame dovetailed hives, with six empty combs and two combs partly filled with honey. The cages were sprinkled with sugar syrup, opened, and placed in an empty super on top of the frames arranged for the bees to occupy. Some of the cages were soon emptied as the bees went down to the combs, while others had to be shaken or the queen found and put below with a cluster of bees, after which I shook out the remaining bees into the super and put on the cover.

Two of these four colonies were run for comb honey and two for extracted. One colony gave me 151 finished sections, which (figured at 25 cents a section—the price for which most of my honey was sold) were worth \$37.75. Deducting the cost (which was \$4.22½ per package, including express) the profit on this colony in seven months was \$33.52½, and there was left in the brood-chamber enough honey to winter them. This

must have been an excellent queen, for the next best record in the apiary was 130 finished sections, made by a colony wintered over. The second-package colony run for comb honey yielded 58 sections, which was considerably below the average for the apiary. However, the average for the two colonies; 104½ pounds, was above the average for the apiary.

My second order to an Alabama man for six packages was never filled, but after some correspondence the advertiser was prevailed upon to return the purchase price, which he did about midsummer. Had this man known that by accepting my order and holding my money, he was depriving me of an opportunity to place this money where I could have made it earn a clear hundred dollars in seven months, perhaps he would not have booked orders far beyond his capacity to fill.

But the man from Texas was all right. On Apr. 27 his shipment of 20 packages arrived and was hived as the others were. In just 10 days, on May 7, some of these queens had sealed brood in two frames—pretty good evidence that they got to work as soon as they struck the combs. One of these colonies was run for comb honey and yielded 87 finished sections worth \$21.75, from which, after deducting the purchase price which was \$3.43½, we have a net profit of \$18.31½, and stores for winter. I started two of these Texas colonies as comb-honey colonies, but one of them swarmed when the first super was about half-full and I put them back and gave them an extracting super.

No per-colony record was kept of those run for extracted honey; but the package bees did about as well as the other bees. I am sure that some of them surpassed some of the home-wintered colonies. Of the 24 packages one queen was superseded, and two of the others proved such poor queens that I replaced them with cells from good queens.

On the whole, I was well satisfied with both shipments. They came thru in good shape, were easily transferred from cage to hive, and were money-makers. I would like to get such packages by Apr. 1 if I could, but Apr. 15 is about as early as the Southern men will ship. If one has empty combs to give them on and one or two combs containing four or five pounds of honey, the bees, at that season and in this locality, will get plenty of pollen for brood-rearing.

R. R. Banta.

Oquawka, Ill.

[There is little question that these long-distance purchases may be made to pay well. From this article we infer that the brood-chambers were not contracted to the size of the cluster and that no brood was given the bees on their arrival. Had this been done, wouldn't the crop have been larger?—Ed.]

WHERE was your blue pencil, Mr. Editor, when you let "Our Food Page" get by you in March Gleanings? All that about picking fruit off the tree in winter (it was zero here March 1), grapefruit at 20 cents a dozen, and things like that to make our mouths water and to make us wish we were millionaires so we could mount a flying-machine for Florida. Have a heart, Mr. Editor, and look out what that Puerden woman gets in hereafter.



Dr. C. C. Miller

Not more than a quart of dead bees in the Medina cellar in the first month or so, but wait till the last month.

In one respect the National convention at Chicago was better than any other I ever attended—more women there. With two such women as Mrs. Allen and Miss Fowls, it just had to be a good convention.

"The extent of honey exportation can be judged in some degree by the fact that a firm in Medina, O., exported more than \$1,000,000 worth of honey to Belgium alone during the past year."—Los Angeles Times.

H. K. Hartman inquires about my 1918 crop, page 172. The season was a failure. The worst drouth ever known here dried up the clover, and the fall crop, which of late has been considerable, was lacking, cutting down the average to 36 pounds.

The objectors to large hives because they are too heavy to handle "should not overlook those weekly examinations that large hives (timely supported by supers and other essentials) permit to be entirely discarded," says D. Barone, page 172. Yes, the total pounds lifted may be less with large than with small hives. "But," replies the objector, "that hardly counts when I can't lift the big hive at all."

J. F. Parker uses staples on end-bars to prevent killing bees when handling frames, page 169. I tried that, and altho one can handle frames with such staples more rapidly without killing bees, I gave it up because the jarring of the staple on the hive-wall stirred up the bees too much when looking for a queen. For one with very unsteady nerves the staples may be advisable, but the average beekeeper can avoid killing bees without the staples.

White ants have been known in one or two cases to injure wooden hives when the hives were in direct contact with the ground, page 172, March Gleanings. I never

saw a white ant, but there is a big black ant here that's a dangerous customer for any one who hauls hives. I never knew of its disturbing the bees, but it

honeycombs the bottoms of the hives—and they needn't be on the ground either—so that when hauled they are jarred to pieces, altho without careful examination one would discover nothing wrong.

* * *

On page 175 George Kissam asks about "a bluish tint on the cappings of the stores." I suspect he refers not to the color of the cappings, but to something on the cappings. I don't remember seeing anything of the kind in late years, but formerly I sometimes found on the cappings of brood-combs in early spring a bluish-gray substance that was not ordinary mold but looked a little like it. I don't know what it was, but as it was on the cappings of sealed honey it was no evidence of insufficient stores. It was found in prosperous colonies, and didn't seem to do any harm.

* * *

Arlie Pritchard gives some definite figures on page 167 as to naming the badness of cases of foul brood. Good for you, Arlie; that helps. But wouldn't it be better to give the per cent of diseased cells instead of the number? Wouldn't 40 bad cells in a small colony be worse than 40 cells in a large colony? Still it's much easier to give the absolute number than the per cent. The editor says beekeepers will not agree as to what is bad or mild. That's just it. How can they agree so long as neither knows what the other is talking about? But if the views of inspectors and others were obtained, don't you believe we could settle upon some sort of standard? Certainly we never can agree upon what a bad case is so long as no one says just what he means by "a bad case."

* * *

That Medina cellar, page 137, interests me very much. The inside ceiling is 4 feet below the level of surrounding ground. Not many cellars like that, and it must be a good thing. I wish the bees might have had a longer winter in it. Mine were taken in Nov. 19, 17 days before the first of yours, and 37 days before the last. Being able to hold temperature between 44 and 50 is fine, but I wonder if the bees wouldn't like it a little warmer. Wait till I go down cellar * * *. It's 52 in my bee-cellar this 26th day of February at 11 a. m., and the bees quiet. Outdoors it is 16 above zero, and this morning it was 6 above. I think it has not been above 60 in the bee-cellar, nor below 40. But that 20 degrees of variation looks pretty crude beside your 6. Yet the bees will stand it all right if they have pure air,

and you seem to have that matter pretty well under your thumb. I wish you could measure the purity of the air, and then had an exact measure of the uneasiness of the bees at different grades of purity.

* * *

A. I. Root, when I read what you and Prof. Thorne have to say, page 182, there came to mind these fine lines from Pope's Essay on Man, which I here transcribe for you:

Heaven from all creatures hides the Book of Fate,
All but the page prescribed, their present state:
From brutes what men, from men what spirits
know;

Or who could suffer being here below?
The lamb thy riot dooms to bleed today,
Had he thy reason, would he skip and play?
Pleased to the last he crops the flowery food,
And licks the hand just raised to shed his blood.
Oh! blindness to the future! kindly given,
That each may fill the circle marked by heaven,
Who sees, with equal eye, as God of all,
A hero perish, or a sparrow fall.

* * *

That Byer-Crane controversy, page 157, may lead to some useful experimenting. Mr. Crane says he crammed hives with honey in October with bad results. But one important item in the case he doesn't tell us about. Please tell us, friend Crane, how much room there was for clustering below the bottom-bars. With little room there I should expect bad results; with plenty of room I should expect good wintering with not an empty cell in the combs at the start. I'll tell you why I think so. In the winter I have the beautiful sight of great clusters below the bottom-bars, reaching to the floor two inches below. How much deeper the cluster would be with more room I don't know. If the bees enjoy clustering below the bottom-bars when there is the usual room above, don't you believe they would like it with only honey above?

* * *

It is somewhat of a problem to prevent drifting when placing bees on their summer stands and at the same time keep the colonies warm enough. To avoid any trouble from bees flying back to their winter location, bees should be put on their summer stands quite early, say in March, before they have flown enough to mark fully their location where they have been thru the winter. Aside from that one difficulty, it will be better to leave them packed till soft maples are in bloom, or even till the middle of May; and this one can do by taking a little extra trouble in this way: When one has removed the bees from their winter quarters, let him put in their old place a hive with empty combs. The returning bees will assemble on these, and at evening can be brushed in front of any hive where they will do the most good, a repetition being necessary for a few days.

* * *

How many worker-cells in a Langstroth frame? The frame is 17½ by 9½ outside measure. If the thickness of the top-bar be

¾ inch, the bottom-bar ¼ inch, and each end-bar ⅜ inch, then the inside measure is 16⅞ by 8, or 135 square inches. If we count 25 cells to the square inch, as is often done, there will be 3,375 cells on one side, or 6,750 on both sides. But if there are 5 cells to the linear inch, there are 2813/15 cells to the square inch, making 3,897 cells on one side, and 7,794 on both sides, this last being 1,044 more than when we count 25 cells to the square inch, a difference of a little more than 15 per cent.

But this is counting on perfect combs, and perfect combs are not the rule. The bees are likely to have a passage between comb and bottom-bar part way or the whole way of the bottom-bar, and often for some distance between comb and end-bar. Perhaps it may not be out of the way to count that the deficiencies will amount to as much as half an inch in depth for the length of the bottom-bar. That will give us for the average comb 3,653 worker-cells on one side; 3,650 is near enough, and that's easy to remember, for the first three figures at the left give the number of days in a year. For both sides the number will be 7,300.

* * *

R. H. Pettit, Entomologist of Michigan Experiment Station, has given out some interesting results of experiments as to materials for winter packing, concluding that "ordinary leaves, raked up, dried, and firmly packed, give the best results of any material tried." He says: "From our tests it would appear that the heat-insulating values of the various substances compare about as follows: Dead-air space, 18; corrugated card-board, 33; planer shavings, 34½; mineral wool, 35½; forest leaves, 41."

From this we may figure out that if forest leaves are taken as the standard, or 100 per cent, we shall have the following: Forest leaves, 100; mineral wool, 86.6; planer shavings, 84.1; corrugated paper, 80.5; dead-air space, 43.9.

"Tests," says the report, "were also made to determine the relative rates of heat loss when one surface of the chamber was left unpacked. When the bottom surface was unprotected there was a loss of about 3½ degrees F. in temperature. One unprotected side produced a loss of 4 degrees. With the top surface alone unprotected, a loss of nearly 5 degrees resulted."

That shows that the top is the most important part to protect, and that to leave the bottom unprotected is nearly as bad as to leave one side bare. But these findings do not warrant the view (that I think has been held by some) that to have the top protected is more important than to protect the four sides, for the loss from an unprotected top is 5 degrees and from four unprotected sides it is 16 degrees.

[We rather question the conclusion as to relative loss of heat at top and sides as here stated. Would not the proportional loss be greater at the top than given above?—Editor.]

ALL in all, that is a most excellent article on "Taking Bees From Cellar," by Belva M. Demuth, page 143, March Gleanings, and no

young beekeeper can go very far wrong by following the advice given. The idea of taking bees out in weather too cold for them to fly is rather new, but it is all right. I have practiced it more or less in recent years and find it works all right.

* * *

Those letters from California by Editor E. R. Root are most interesting.

* * *

That method of using cornstalks for wind-breaks, as given on page 151, seems practical and within the reach of most beekeepers. It is especially valuable when lumber is as expensive as at the present time.

* * *

I am not surprised at the criticisms, found on page 149, of J. F. Kight's method of treatment of incipient cases of American foul brood. It seems too much like playing with fire. Better not fool with it.

* * *

As in most parts of this country and Canada, the winter in this locality has been very mild, the thermometer registering zero on only a few mornings, with no severe storms. In February bees had a good fly in protected situations.

* * *

There, now, Mrs. Puerden, I am surprised that you should even feel like accusing good Mother Nature of partiality because she does not give us six months of strawberries here in the North. Why, we have an abundance thru June and early July. Then the season lets up a little that we may enjoy the delicious raspberries and blackberries. In August we may have strawberries again and continue to have them until they freeze up in November, if we plant the right varieties and care for them.

* * *

F. B. Paddock informs us, page 165, that his bees were gathering pollen from the elms on Jan. 29 in Texas, while we were looking up into the trees at the buds and hoping they would open by April 20. Surely, this is a great country. But if our bees can not gather pollen for a long time, I enjoy sitting with my feet to the fire like that "Back Lot Buzzer," page 169, and reading about the bees in other parts of the country where they are gathering pollen.

* * *

"European foul brood, together with unwise inspection, has decreased the number of colonies in one county in California nearly 50 per cent," says the Western Honeybee,



as quoted on page 170, and doubtless the statement is correct. The law is good and helpful, but more and more, I believe, inspectors are coming to

the conclusion that the time of an inspector is best spent in instructing those who are interested and willing to take pains with their bees. The greatest satisfaction that has come to me as an inspector has been in helping those that were willing to help themselves.

* * *

After all I have written about the folly of using shallow extracting-frames I find myself making up a lot this winter for use during another season, more for experimental purposes than any other reason. A friend who uses them says that they do not require wiring, and in looking over a lot he had used I could not see that they had sagged enough to do any harm—and he used light super foundation in them, too. Well, in nailing them up I found that while it required more of them to hold 100 pounds of honey than it would of full-depth Langstroth frames, it required no more lumber, as a $\frac{3}{8}$ -inch top-bar is ample to support the lighter comb. I also discovered that I could make enough of them to hold 100 pounds of honey as quickly as I could of Langstroth frames, for I am saved the trouble of wiring. Now, if it proves true, as some claim, that one can uncap 100 pounds of honey in shallow frames as fast as the same amount in full-depth frames, I am not sure but that those who advocate this style of frame will have the best of the argument.

* * *

Some advice given in October Gleanings page 587, in regard to taking off sections as soon as sealed over, has been given, I believe, many times during the last 40 years. It looks like good advice, and it is good advice in a general way, but—

Suppose I have a yard of 100 colonies that are filling their supers rapidly, if I were to follow this advice I should need to go over the yard inspecting the sections every day, if I am to remove them as soon as finished; for many will be found finished today that were unfinished yesterday. If one is keeping bees where the sections can not remain on the hive a few days after being finished without getting badly soiled, better take surplus honey with an extractor. We go over our yards, removing finished supers and sections once in eight or nine days. Another objection to this advice is that unless you have a super than can be condensed or reduced in size near the close of the season, one must fill the space of the sections removed with empty sections, and so have a large number of unfinished sections to carry over or melt up for wax.

HERE in the pretty little town of Hinsdale, about 17 miles from Chicago, I have been sitting for 10 minutes gazing at a sheet of blank paper in a quiet typewriter, and nothing happens. Dare I try to write about the National convention? The Editor mightn't like it. The readers mightn't like it. The National mightn't like it. Maybe it doesn't belong to a side-line department, anyway. But I am so full of it, so soaked with it to the finger-tips, that nothing else will come out; and my paper, unless filled with comments on the National, threatens to remain tragically blank. So—may I, Mr. Editor?

The National Convention as Seen by a Side-liner.

Somehow I overlooked the fact of that Chicago and Northwestern meeting, and hurried from the train over to the Hotel LaSalle, thinking to plunge promptly the tardily into the National, and soon I was listening in great delight to Prof. Francis Jaeger of St. Paul.

Any convention was the right one that could supply such a treat as that. He was recounting some of his experiences "over there." That I missed the first of it was my great misfortune; but I did hear about the brick house in Monastir, with its walled garden, and the beekeeper trying so hard to be progressive; the 40 long trunklike beehives with 27 Jumbo frames each; the homemade foundation $\frac{1}{4}$ inch thick, weighing a pound to the sheet; the extractor made from sheetiron from the battlefields; and the honey vinegar; and (soft pedal) the honey wine (yes, and he knows how to make stronger things, added the genial lecturer); and the story of Prof. Jaeger's own beekeeping experiences—how he bought (only the owner would take no pay) three of these long-idea hives from the walled garden, and drove into Monastir in a camouflaged auto, he and his companions in peasant dress, bringing out the bees right in the daytime, tho it made a most exciting trip under the falling shells; how he transferred the bees into some modern hives shipped from the A. I. Root Co.; and how they started promptly drawing out the new foundation.

This was in August. There had been no rain since May, and all the earth was bare and dead, and there was no green thing nor blooming thing for eight miles around, and the thermometer was 110 and 120; yet within three weeks there was capped honey in the hives—the famous Hymettus honey, Prof. Jaeger said. Yet never, for all his trappings and searchings, did he see a bee at work. Only thistles were blooming, and no bee paid them the honor of a visit. But round about were mountains, great mountains, some of them 9,000 feet high. Off to the

Beekeeping as a Side Line

Grace Allen

southeast even storied Olympus was visible. And every afternoon over these peaks the great clouds trailed, bearing their vapors for blessing. High on the mountain

sides was refreshment and greenness, and the aroma of wild thyme and flowers crushed underfoot where one walked. Below in the arid valleys, the bees touched not even honey itself left about the yard; but up, ever up and up, they soared; and when the rains finally came in October, behold the queens were honey-bound. Do you wonder we were fascinated with Prof. Jaeger's talk?

And the wealth of that Balkan region! Coal, oil, iron, quartz, gold, copper, lead, mineral springs, water power, timber—well, if ever a beekeeper mysteriously disappears—find out if he heard Prof. Jaeger at Chicago in 1919; if he did, page him in the Balkans.

But he did not stop there—he carried us, later, in the opening address of the National, into a state even further removed than the Balkans—a state of high development in the beekeeping industry—when beekeeping should be one of the chief branches of agriculture; when it should have taken such full advantage of the splendid scientific assistance so generously given by a learned and patient Bureau of Entomology that it should have developed worthily into a great industry. He called our attention to the cow, which, he asserted, has stepped quite out of zoology and become an industry. Entomology, he further asserted, deals with June bugs and cooties and bedbugs, and some 196,000 species, each one as bad as the other—except two, the silkworm and the honeybee. The silkworm has left entomology and become an industry, while the honeybee, alas, is still among the cooties!—where it belongs no more than canned beans belong in botany or butter in zoology!

If you have never heard Prof. Jaeger speak, I do most heartily recommend your attendance upon the next gathering where he is to appear. Witty yet earnest, fluent, vigorous, dramatic—he is indeed a most pleasing and convincing speaker.

Then there was Mr. Kindig—also with a peninsula, the Upper Peninsula of Michigan. He told us all about it and its wonders, most enthusiastically. And how 117 nuclei shipped up there in the spring were increased to 204 full colonies, made ready for the winter, and yielded 11,000 pounds. If the adventurous beekeeper who disappears is not to be found in the Balkans, look for him in Mr. Kindig's Upper Peninsula. Or indeed, in North Ontario, recommended so enthusiastically by F. W. Krouse. Tons and tons from 300 colonies! I hope these things aren't secrets. If the Editor thinks

they are (or ought to be) he has his blue pencil. They were told in open meeting.

But let no one think the whole session was given over to rosy reports and alluring descriptions. Dr. Phillips was there. Definitely, clearly, concisely, he discussed "The Control of European Foul Brood." He outlined the three principal methods of control, all three principles being suitable for swarm control and equally applicable to European Foul Brood.

"How can I tell European from American?" some one asked. Whereupon the ever-courteous entomologist explained that if it resisted this treatment, properly applied, it is probably American. Moreover, the American ropes out 4 to 6 inches, in a fine thread, while the European ropes out only about 2 inches, coarsely, and then breaks—as a worn and weary rubber band breaks. And many many more questions he answered. In the fall see that bees have ample room, ample packing, ample stores—60 pounds, for instance. Do this in September. In spring see that brood-rearing starts with vigor and enthusiasm eight weeks before the opening of the honey flow. He further said, in a talk on "Factors Influencing Secretion of Nectar," that, contrary to general opinion, well-kept records show that the flow of nectar, instead of being immediately increased by rain, is decreased, not becoming normal again till the fourth day later; tho, without question, frequent rains tend to lengthen the period of secretion.

On Wednesday morning I realized in utter dismay that I had missed Miss Fowls' talk on "Pushing to the Front in Beekeeping." Imagine trying to make comments on a convention where you failed to hear one of your own Editors! It is downright embarrassing. But it was my misfortune that my sister's apartment is far out and that Miss Fowls was the first speaker of the morning. However I did hear her give a most comprehensive presentation of the symptoms, results, and seriousness of the disappearing disease. And I know that her main address was both forceful and impressive. And isn't it good to meet an interesting and successful young woman, with pleasing personality—whether she's your Editor or not?

W. H. Hall of the Bureau of Markets surprised us with the statement that this bureau has a leased wire system of 1,000 miles, the largest of any except that of the Associated Press. There is no reason why any honey-producer should be uninformed as to current market prices.

Prof. E. G. Baldwin, stressing the importance of extension work in beekeeping, repeated somebody's catchy and worth-while slogan, "Better keep bees better or better not keep bees." Prof. Eric Millen gave us some interesting glimpses of "Beekeeping as Seen by a Bee Inspector." Kenneth Hawkins gave a comprehensive survey of "Beekeeping in Dixie."

It was in the Wednesday morning meeting, as it neared the noon, that Dr. Phillips

interrupted a lively discussion by announcing "We have with us this morning the greatest beekeeper in the world, and we all want to hear from him." That meant the great moment of the convention had come. How can I tell you the thrill of it? To the sound of ringing applause Dr. C. C. Miller rose. "And all that sat in the council, looking steadfastly on him, saw his face as it had been the face of an angel." Not that only, but of a man also who has lived greatly and worked greatly, in the spirit of the greatness of simplicity and kindness. This was all in his face, where there was also wisdom and wit and years and youth and infinite friendliness. And the first words of the greatest beekeeper in the world, spoken in his strong gentle voice, with his wonderful smile, were "I wish I knew something to tell you that no one else knew!" And down in the back of the room there was a certain side-liner so deeply stirred by the sight and sound of him that she can scarcely recall one other word he said!

We were very glad that Mrs. Miller and Miss Wilson accompanied him, not only because they were Mrs. Miller and Miss Wilson, but because it is always a pleasure to meet gentlewomen.

And then, last but by no means least, came the matter of organization and reorganization. Addresses or papers on different phases of this subject had been ably presented by Colin P. Campbell, Grand Rapids, Mich.; Chas. B. Justice, Los Angeles, Cal.; and Prof. H. F. Wilson, Madison, Wis. And there were speeches and committees, majority reports and minority reports, motions to adopt things and motions to table things, objections, personal privilege, points of order, roll-call voting, and over it all Mr. Kindig calmly presiding, flanked by the capable secretary, Floyd Markham of Ypsilanti. When it was all over we were committed to the policy of re-organization (for the 15th time, said those who had attended that many conventions!), the fate of the National to be decided next January. Then officers were elected. They demurred, one after the other, but yielded gracefully at last—and it looks like a good, strong executive committee: Mr. Kindig, president; Miss Sly, vice-president; and Mr. Justice, secretary-treasurer.

Then the Convention adjourned, sine die, pronounce it as you please. Yet it was not at an end. Many lingered for a delightful exchange of experience and a closer personal acquaintance that added greatly to the deep pleasures to be stored away in our memories. And indeed, is there really ever an end to such things as conventions, the coming together of people with common interests? It seems to me there is something in the human heart that will not let them end. The good will, quietly deathless, lives on in our inmost lives, while the inspiration and the quickened zeal—who can measure them or set them a bound or say, "Lo, here they end"?



FROM NORTH, EAST, WEST AND SOUTH



In Northern California.—The rainfall during February brought the average for the season up to March 1 to nearly normal. During the first two weeks the almond bloom was scarcely visited by bees owing to cold, rainy, and windy weather. Other deciduous fruit bloom is now (March 5) opening up, and it is hoped by both beemen and fruitmen alike that a week or more of warm weather will prevail. Up to the beginning of March the consumption of stores was above normal and numerous beekeepers have been compelled to feed. The writer believes that if beekeepers would pay more attention to windbreaks about their yards they would be very agreeably surprised in the matter of honey consumption during the winter and spring periods. Aside from the increased consumption of stores the condition of colonies is normal. Breeding is active and some American foul brood has been detected, but as yet no cases of European have been reported.

The question as to whether or not the California beekeeper should purchase part or all of his queens or raise part or all of his queens, is an important one. Your correspondent believes that no beekeeper should attempt to rear queens and expect to profit thereby, unless he has become thoroly familiar with bee behavior. It is a comparatively easy matter to raise queens, and in large quantities too, but to raise the right kind of queens requires an expert knowledge of the habits of bees and a great deal of painstaking work. It is a notable exception to find a man with only two or three years' experience in handling bees able to raise good queens, but the large honey-producer that wishes to make the most out of his business should understand how to raise his own stock. We cannot do without professional queen-breeders and must always have them, for all beekeepers must get their pure stock from some source. Nor must it be taken for granted that when once pure stock is obtained that it is unnecessary to renew such stock from time to time. The large producer with hundreds of colonies has an excellent opportunity, provided he keeps proper records, to select his breeding stock. His selection must be a pure selection—we will say a leather-colored queen—and daughters raised from such a queen need not necessarily be purely mated. As a matter of fact, some unpublished experiments by the writer have shown conclusively that the first generation of hybrids are better honey-producers than either pure yellow or pure black stock. This fact only holds true for the first cross as the second and third crosses result in very inferior honey-gatherers.

During the first session of our legislature no less than four bee bills were introduced. These bills were variously commented upon

by beekeepers thruout the State. Altho they all possessed some good points they had nevertheless undesirable features as well, and at a recent meeting of the Board of Directors of the California Honey Producers' Co-operative Exchange a resolution was adopted to the effect that the Board could not recommend the passage of any of the proposed bills. M. C. Richter.
Modesto, Calif.

* * *

In Southern California.—Altho rainfall to this date, March 4, has not been as much as we had hoped for, yet plants are looking well. The eucalyptus has not bloomed nearly so profusely nor furnished nectar so abundantly as last year, probably on account of the cold weather. This winter has been much colder than last winter—in fact, much colder than for several years.

Our neighboring county, San Bernardino, has again changed inspectors and the affairs of the office are now looked after by B. H. Stanley of Rialto, a beekeeper of much experience.

Unfortunately it has once more been necessary to impress upon a migratory beekeeper the importance of notifying the inspector when moving bees into California. A large apiary was moved into Riverside County and no notice given. The result was that the owner was arrested and fined. This is a good law.

One of the matters of vital importance to the beekeepers of the West in general, and to southern California in particular, is the selling of the 1919 crop. We shall be afforded the opportunity of marketing thru various agencies. The State Beekeepers' Co-operative Exchange will likely handle by far the largest percentage of the products. The Southern California Beekeepers' Association will take care of the crop of its members. The beekeepers who are not members of any association will sell their honey on the market or will sell to commission men or brokers. All work hard for what they get and want to get all possible. While at present beekeepers' organizations may not get any more for a crop than the man outside gets for his, prices will be made stable. Such conditions as have existed in the past when one man has contracted early in the season for 5½ cents, while his neighbor who held his crop until midsummer got 13 cents per pound, will be done away with.

April in our locality calls for a close watch on the bees and also for much manipulation in order to get the best results. Any colonies short of stores should be very carefully looked after and fed enough so that the old bees will not find it necessary to go out of the hive in the cold weather to find food. A colony at all weak or one short of stores will need all of the bees it has to



FROM NORTH, EAST, WEST AND SOUTH



keep the brood warm. The queen at this season will produce all of the brood that the bees can possibly cover; and, if many of the old bees are lost before plenty of young bees are hatched, the colony may be lost. The writer has seen hundreds of colonies, with several frames of brood in all stages of development and with a good queen, have only a handful of bees left. This, to me, came as near representing "spring dwindling" (as written of by our Eastern friends) as anything I have ever seen. With some colonies strong in bees as one finds in most apiaries at this time of the year, you can select a few combs containing plenty of young and hatching bees. Shake the adhering bees in front of the weak colonies, being sure that you do not get the queen with them. The old bees will return to their own hives, while the young ones will enter the home of the weak colony and be received without trouble. As the hives become filled with bees and brood, it will be wise to put on supers well ahead of the probable honey flow. To arrange your manipulation so that the supers will go on just as the surplus honey flow starts is, of course, the ideal way. But to have all of the colonies with supers on a week ahead of time is far better than to have the hives overcrowded and not get the surplus room until several days after the flow starts. If one uses excluders there is all the more necessity for early supering, as the bees will not always remove the honey crowded around the brood. Then, too, as the queen cannot get above, swarming will be much more likely to get the attention of the beekeeper.

The Riverside County Beekeepers' Club held its annual meeting on Feb. 22, at the county court house, Riverside. It was unanimously voted to instruct the secretary to write to our representatives at Sacramento asking them not to support the beekeeper bills now in the legislature. The new laws would place the industry under the Department of Agriculture and would have a state apiarist appointed. All county work would be under the Horticultural Commissioner. Any one engaging in the business would pay an annual license fee of 10 cents per colony. No bees could be moved at any time without first giving 10 days' notice to the Horticultural Commissioner. We do not feel that any improvement would be made by such drastic changes as proposed by Mr. Lindley in these bills. The following officers were elected for the ensuing year: R. Powell, president; Chas. Hinzle, vice-president; Lester Bamburger, secretary. Mr. Horne, who has served the club so successfully for several years, found it necessary to give up the work of secretary, owing to his time being so taken up with his duties as secretary-manager of the Orange Belt Co-opera-

tive Honey Producers' Exchange and with the management of his beekeeping interests. Corona, Calif. L. L. Andrews.

In Ontario.—Weather has continued milder than usual right up to March 7, and it looks as if the present winter will be one to remember for its mild weather. Yet a peculiar feature, so far as beekeepers are concerned, is that we have not had a day warm enough for a thoro flight since last fall. This applies to local conditions, as they have no doubt fared differently in southwest Ontario. Wherever bees have had an abundance of good stores they appear to be in good shape, provided they were of fair strength last fall. Unfortunately, many are reporting bees short of stores, and we have to confess that some of our own bees are in that condition. Bees in the smaller hives that had little honey last fall and thus had to be fed, are the best off at present, as with well-filled brood-nests there was little room for breeding and a consequent using up of stores. Our larger hives that had natural stores, and, owing to sugar shortage, were not fed sugar syrup, are in many cases very short of food; in fact, some are about out and have to be fed—a nice condition surely for bees to be in by the middle of March. I have had colonies get short of stores in April now and then, but never before at this season. My judgment was either very faulty when passing them last fall or else consumption of stores has been abnormal where bees had too much room to rear brood out of season. Mr. Kindig, in the March issue of *Gleanings*, advises in case of shortage of stores to feed "hard candy or loaf sugar." Of course, candy answers all right, but I have my doubts about the loaf sugar, altho I have seen it recommended previously. I have been trying a few pounds on a few colonies, and when they are forced to take it, I find the bulk of it being thrown out at entrances in granules. Has any one really fed loaf sugar with success? Reports would be interesting.

Last week I was in Toronto, and a casual inquiry here and there showed that honey is much easier than a few weeks ago. Not that it is selling much lower in a retail way, but wholesalers are playing a waiting game and do not care to load up at any price.

Combless packages of bees are now admitted to the mails of Canada on similar terms and restrictions as to form of package, etc., as are in force in the United States. I understand that arrangements have been made with the customs so that clearance will be made at the customs' port nearest consignee and the packages forwarded to the consignee's postoffice direct. But I have had nothing definite on this



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point. This will, if granted, be a very important concession, as delays in customs have been one of the worst nuisances connected with the pound-package business, especially when bees have come a long distance and have been on the road a long time.

With practically no snow all winter and none at this date (March 7), naturally we have been much interested in the clover situation. In many localities, including our own, alsike is the main source of nectar. The clover is alive yet, for altho we have had no snow to cover it, on the other hand we have had no very severely cold weather, nor alternate freezing and thawing to heave it out of the ground. The critical time is ahead, and the next few weeks will tell the tale. But the clover was well rooted and had a fair top last fall.

J. L. Byer.

Markham, Ont.

* * *

In Minnesota.—This State has experienced the mildest winter in 25 years. In spite of this fact we are receiving reports which indicate that in some localities, at least, bees are not wintering well. This is no doubt largely due to the fact that honey was of a poor quality for wintering, and many did not feed sugar on account of the high price and the difficulty in procuring it. Reports show that sugared bees are wintering better.

By the time this number reaches the beekeepers most of the bees in Minnesota will have been taken from the cellars. Did you save those combs of honey to give the needy colonies this spring? If you did, now is the time to use them. Place under the brood-chamber, next to the bottom-board, a hive body containing combs with more or less honey in them according to the needs of the colony. This leaves the colony in the warm part of the hive with the cover sealed. About the time of fruit bloom or later, when the upper division is getting well filled with brood, you can reverse the divisions, and, if the queen is a good one, all you will lack is a honey flow to give you a good crop of honey. Oh! you haven't the combs of honey. Well, in that case feed sugar syrup and sufficient at one time to carry the colony thru to the honey flow. I feel that this should be emphasized. Stimulative feeding may be all right for the experienced beekeeper after settled warm weather has set in, but let the beginner beware.

No doubt many colonies will come out of the cellar this spring in a weak condition. Many of these can be saved by the exercise of a little care and trouble. The writer has used the Alexander plan with good success. As soon as the weak colony has some uncapped brood in the hive, place it on a strong colony with a queen-excluder between. This should be done without the use of smoke. After placing the excluder on the strong

colony leave it uncovered for an hour or more until the bees have quieted down. Then quietly lift the weak colony from its bottom-board and place it on the strong one. In about 30 days these can be separated by setting the strongest colony on another stand and at the same time giving it some of the bees from the colony left on the old stand to make up for the loss of bees that will leave and return to the old location.

Professor Jaeger is planning to raise queens for Minnesota beekeepers the coming season as usual. The queen-rearing apiary will be in a new and better locality. All inquiries concerning queens should be sent to the Bee Culture Division, University Farm, St. Paul.

Chas. D. Blaker.

Minneapolis, Minn.

* * *

In Texas.—Reports from practically every section indicate that the native honey plants are now in excellent condition. A late frost is yet possible, altho the recent cold spells lead one to believe that a killing frost may be escaped. In every section the bees are building up rapidly, and a big increase is expected to replace partly the severe losses of the past two years. Much increase will be made this year in bees at a possible sacrifice of honey surplus. Therefore, the improved conditions will not react so much upon the honey market as might be supposed on first consideration. Every professional beekeeper will replenish his stock during the coming year in preference to producing a large surplus of honey.

The excellent brood-rearing during the first part of March made inspection work possible and necessary in several counties. There is an increased demand for inspection work each year. The shippers of early queens were very anxious to have their certificates to accompany their first orders.

The cost of bee supplies seems to be increasing without much evidence of relief in sight. Many, last year, withheld much-needed orders for equipment, considering the price prohibitive and thinking that conditions would be better this year. However, the increased value of bees and all their products is supposed to make up for this increased cost of supplies. Transferring should not be neglected because new equipment seems so high. The increased returns of the transferred colony will certainly pay for the equipment. The high cost of supplies has not kept all beekeepers from buying, since every supply house is running to full capacity to fill all orders.

Those who were interested in the bill establishing the experimental apiaries will be glad to know that it received favorable support of the agricultural committees of both branches of the Legislature. Many beekeepers in the State have interested themselves in securing the passage of this bill, and



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such effort has already given visible results.

In this locality the month of April is very important for the beginner in beekeeping. Any transferring that may be necessary should certainly be done in this month. It is not hard and the cost of supplies need not interfere. If a new queen is needed in a hive or two, the introducing may be successfully done if the directions on the mailing cage are complied with. The beginner should be especially careful to detect the presence of disease. Give the very best of attention to a few colonies rather than neglect many. It is not wise to attempt too big things on the start. Attention to a few colonies may show in some colony a food shortage which it is easy to remedy. A little food at the right time will give big returns. The question of producing extracted or bulk comb honey confronts every beginner. Comb is expensive for the bee, but extracting equipment is costly for the beekeeper. A personal choice must decide the question. Every beekeeper should be thoroughly familiar with the sources of pollen and nectar in his locality. The exact management of bees depends upon a knowledge of the bee-pasture available and the time that it is available. The beginner should not expect to be successful with bees unless the problem is given thought. Bee literature should be carefully read. The real satisfaction of beekeeping is the information gained by the study and observation necessary. College Station, Tex. F. B. Paddock.

* * *

In Florida.—At this writing a little orange bloom is opening, but it will be a week or more before the blooming becomes general. Some new honey is already being stored in the supers, but this is mostly from the andromeda, a clear honey that will not hurt either the flavor or color of the orange. The prospect for a big crop from orange is more than excellent, for our bees are in splendid condition, practically all colonies being strong enough to crowd a two-story hive. The crop will be made by the time this appears, and the beekeepers will be studying prices and busily extracting. What price we should accept for our honey, considering market conditions, seems a difficult question. Many producers are talking 24 cents f. o. b. shipping point; but, unless the demand increases, it seems probable that we shall have to be satisfied with a smaller price. We must take into consideration the change in conditions since a year ago. Export trade made the price then; for the European countries, especially Great Britain, were buying enormous quantities of honey for war purposes. They were buying from this country because of its geographical situation—a short haul and consequent saving of shipping—and not because they could not buy more cheaply

elsewhere. Australia, awaiting shipping space, has a four years' honey crop, estimated at from 4,000 to 20,000 tons; and I have reliable information that shipping will now be afforded Australia to move her crops. Other out-of-the-way countries have also accumulated crops, and some large stocks are being held by speculators in this country. Until conditions adjust themselves it would be well to cultivate again our home market, tho not necessarily at a reduced price. We honey-producers are paying exorbitant prices for everything we buy, and we shall be doing ourselves an injustice if we again revert to low prices for our honey, and especially for our orange honey. If we can get 2½ cents for it we must do so; and certainly we should not sell for less than 20 cents, for the price of honey will surely drop sooner than, and out of all proportion to, that of other foodstuffs.

The question of how to pack our honey for shipment arises at this time. Cans are difficult to obtain, and cost too much anyhow. Most of us will use barrels; but what kind of barrels carries best. Is the 50-gallon oak better than the 35-gallon cypress? The A. I. Root Co. bought so much honey in Florida last year that they can tell us which gave best satisfaction. Mr. Selser seems to favor the cypress barrel of 35-gallon capacity. Last year I received many inquiries for the address of a barrel factory. You can buy good cypress barrels from The Cannon Co., Cairo, Ga., at \$2.25 for 35-gallon size and \$2.15 for the 30-gallon size.

Some beginners have taken offense at my remarks in February Gleanings. I must remind those who happen to be hit that nothing in my writings is intended personally; but when a condition prevails I must mention it, even tho it may touch a tender spot in some of my friends. I must say that nothing I have written has brought so many words of appreciation from the big beekeepers as my remarks in February Gleanings. During this month beginners in Florida should watch their bees closely. The crop of orange honey is in the hives and care should be taken not to rob them too closely; for, in this locality at least, there will be no more honey coming in before about May 10, and enough must be left to keep the bees in a prosperous condition until the palmetto and gallberry open. It is good policy to leave at least 20 pounds over and above what may be in the brood-chamber. Also, those last swarms should be watched, for they are likely to run short of stores and then swarm out. All colonies that swarmed and also the swarms should be examined frequently until proved to have mated their new queens. When there is any doubt a frame containing eggs and young larvae should be given immediately.

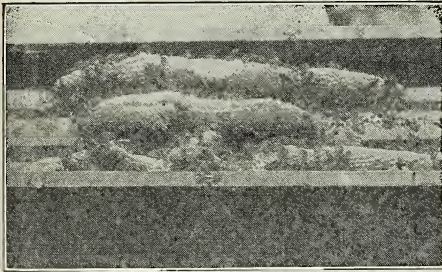
Apopka, Fla.

Harry Hewitt.

HEADS OF GRAIN FROM DIFFERENT FIELDS

Bees That Built Comb Upward.

Regarding bees building comb upwards, page 667, November Gleanings, let me say that last year there were many instances of this in the apiary where I was working. We had a very heavy honey flow which came on suddenly. In one case an empty shallow super had been left on a 10-frame Langstroth brood-chamber by mistake. The bees filled up a great deal of the space by building comb upwards. As far as I can remember, it was not built in circles as Dr. Miller says his was, but connecting combs were built from one to another, in some cases, almost at right angles.



Comb built upwards from top-bars.

I was anxious to obtain a photo, but the rush of work was too great to allow me time. I did, however, later on get a picture of comb built upwards in a nucleus with deep lid and no quilt, which I enclose. You will see that in one place the comb is broken. This was where the bees attached it to the roof when they got up to it, but I know it was built up gradually until the roof was reached, and was not built down. I have also known many cases of foundation being drawn out at the bottom before the top.

B. Blackburn.

New South Wales, Australia.

Not Always the Queen's Fault.

I have noticed at times, in Gleanings, statements and remarks in regard to poor queens, one recently going so far as to classify the lady of the Queenom to that of a "Hun." I am sorry to say that I can not agree with this comparison, no matter how poor or poverty-stricken she may be in her little colony.

But what I started out to ask was: How poor is a poor queen, or, in other words, when is a poor queen poor?

Isn't it a fact that, as a rule, a queen whose colony shows up poor in the spring, is just simply demoralized from some reason or other? Isn't this reason a lack of bees or stores, caused by faulty wintering, perhaps too much room for the size of the colony, or stores remote from the brood-nest, or a hundred and one things, which might

bring about the loss of her subjects, whereby she is judged? While it is true that a queen of this description will remain poverty-stricken throuth the season, barely building up the colony in fair shape for the following winter; yet, on the other hand, a brood-nest of hatching brood placed on top of this same queen's colony will cause her hive shortly to become a rouser, ending the season second to none, a veritable top-notch. I am inclined to think there is a reason for indifferent queens and colonies, and believe the remedy could be found in better beekeeping. Out of seven nuclei set off last season and gradually filled out with brood and full sheets, five are in fine shape for winter. Over each of the latter, when the foundation was drawn out, I set a shallow super of stores and brood merely to get them out of the way for the time. The other two nuclei gradually dwindled, were robbed out, and disappeared. From this experience it seems to me that stores with sufficient helpers would be the panacea for many of the so-called poor queens.

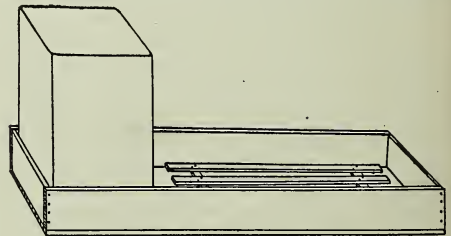
Cincinnati, O.

John E. Roebing.

A Practical Open-air Feeder.

As I have never seen anything similar described in Gleanings, I offer a description of an open-air feeder used by Wesley Foster of Boulder, Colo., when feeding thin sugar syrup in the spring for stimulative purposes.

A flat-bottomed trough is made by nailing a 3½-inch rim, made of 1-inch boards, around a board 10 inches wide and 3 feet long. A float is made by spacing five pieces of lath, each 24 inches long, an equal distance apart, so that when they are cleated



Will feed a whole apiary in a few minutes.

together the float will easily slip lengthwise in one end of the trough. A small piece of ¾-inch board is nailed to the bottom piece at one end to support one edge of a 60-pound can. When ready for use, the can is filled with sugar syrup of the desired consistency and, after removing the cap, inverted and set in the end of the trough so that the edge of the can opposite the opening rests on the cleat. The end of the feeder that contains the float should be slightly the lower. The float prevents the bees from drowning and

HEADS OF GRAIN FROM DIFFERENT FIELDS

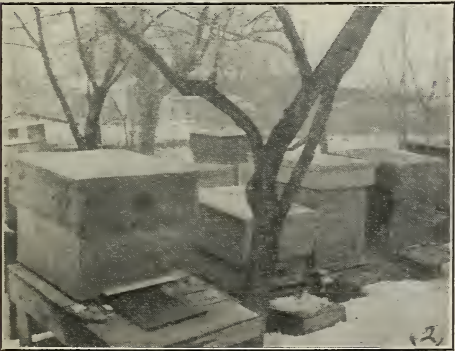


One of Wesley Foster's out-on-the-prairie apiaries. gives them a large surface to work upon. When these feeders are used, one is able to feed a large yard in a few minutes.
Jennings, Kan. M. L. Dodson.

"Important, if True." For placing diluted royal jelly in queen-cups, and for transferring larvæ, try a medicine-dropper with large bulb, and with tube just large enough to fit into the worker-cells.
Slater, Ia. Carl A. Anderson.

[I don't know whether this plan will work or not. If it will, it will be a mighty good thing.—Mel Pritchard.]

Big Hives a Big Success. I have done some experimenting with large hives just for my own satisfaction. I started my beekeeping career with 8-frame hives and later changed to the 10-frame hives, and last spring built several hives holding 12 frames. I have proved to my own satisfaction that the large hive is the right thing for this locality. My business calls me away from



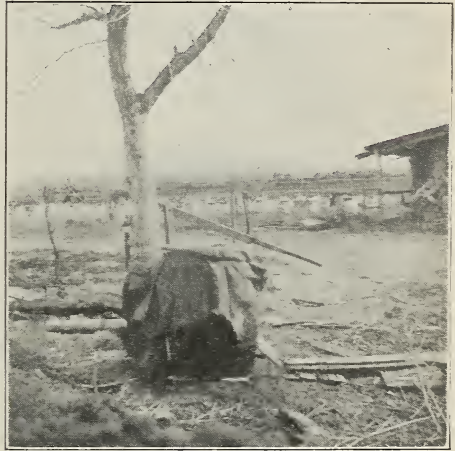
The hive at the left was 12-frame. The colony in it not only showed no desire to swarm but produced 250 pounds of surplus honey.

home a large part of the time, and when using the small hive I had a whole lot of trouble from bees swarming, which occurred almost always when I was busiest. Last spring I transferred several swarms to the large hives, and during the season not one of the swarms showed any desire to swarm. One of the colonies in a large hive produced 250 pounds of extracted honey, besides three full-depth 10-frame supers that I have stored away for feeding in the spring, if I find it necessary.
H. J. Quereau.

Baldwinsville, N. Y.

Water Supply for Bees.

The picture shows a New Mexico apiary of 200 colonies in the background and an ordinary barrel filled with water. The barrel has a 1 1/4-inch hole about 1 inch above the bottom, in which a



A water-supply device for bees used in New Mexico.

tin pipe about 6 inches long has been inserted, the end being soldered tight (a cork may be used for the same purpose). On the upper side, about an inch from the end, a very small hole is punctured, thru which the water, due to its own pressure, shoots upward, insuring a continuous flow. A thin board is leaned over the pipe to break the force of the water, the lower edge of which is placed on small scraps of boards lying on the ground. Thus all these boards are kept wet, which assures all the bees in the apiary a steady supply of water without the least danger of drowning any. The vent hole in the pipe should be on top so that sediment in the water may not stop it up. The top of the barrel must be covered so that the bees may not get to the water from the top. A piece of burlap makes a good cover for this purpose. Also, it is advisable to set the barrel in the shade. The flow of

HEADS OF GRAIN FROM DIFFERENT FIELDS

the water may be regulated by the size of the hole in the pipe, but in no case should it be larger than a pin head. A 25-gallon barrel usually holds about four or five days' supply of water.
A. L. Heffinger.
Lakewood, O.

Easy Way to Enlarge Brood-chamber.

When Father Langstroth made his epoch-making discoveries, and produced the movable-frame hive, he knew presumably nothing of extracted honey as we know it. Consequently, all that he did and all that others have done until very recent years, was suggested and adapted solely for the getting of the largest possible yield of comb honey. To this end, probably the most important among the conditions necessary was the crowding of the colony to force work in the super. Hence the eight-frame hive and the long and comparatively shallow frame.

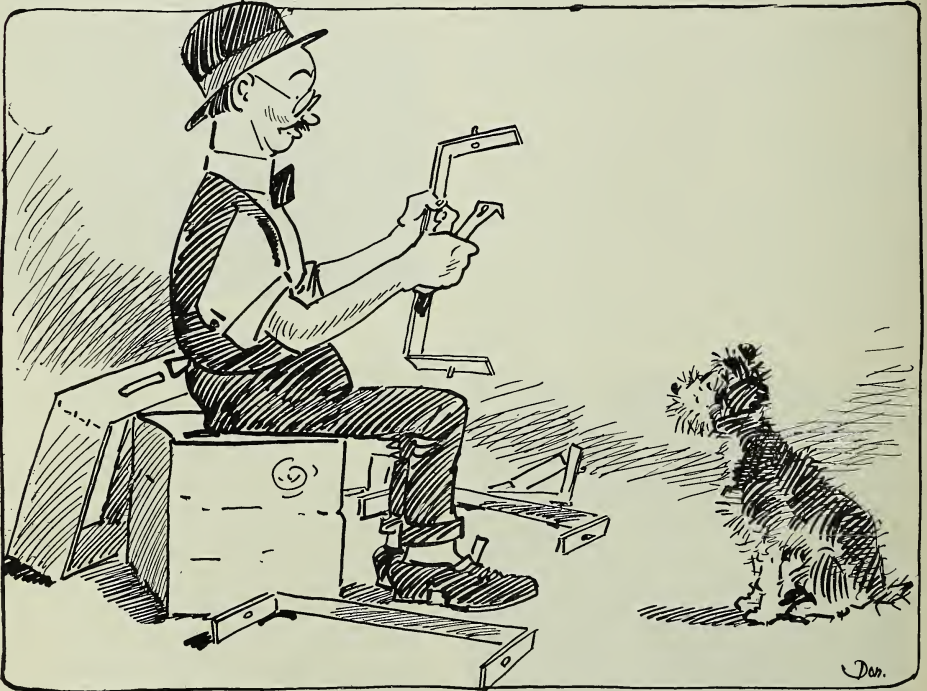
Now that extracted honey has come into its own, different conditions are required—the all-important condition now being large colonies. Therefore, more brood-room.

The only way to increase brood-chamber capacity, barring a second brood-chamber,

is by deepening the frame. This has an advantage in that it brings the form of the brood-chamber more into harmony with bee habit; also it avoids any additional parts to be handled. Very fortunately the "Jumbo" frame, already used to some extent, offers this increased depth, and any standard "L" hive can be adapted to the "Jumbo" frame simply by the addition of a rim $2\frac{1}{2}$ inches deep to the under edge of the hive body. This rim may be attached permanently or be removable, so that any hive body thus deepened may be restored to its original condition without any damage. When such a change is made the old combs of the Langstroth depth can be utilized as storage combs in ordinary full-depth bodies as supers. Such rims should have a wire nail driven into the edge of each side, the head to be cut off and the nail filed to a point. When placed in position and pressed home the rim cannot jig about, and the bees will glue it tight, especially if the inner edges are taken off the least bit to provide a "chink" for propolis. It will be seen at once that no discarding of equipment is necessary, as everything fits as before.

New Jersey.

C. D. Cheney.



THE BACK LOT BUZZER.

Ever since it was learned that Uncle Ez Peachbloom knew how to make spirits out of honey, he has been getting a powerful lot of mail. They can pester all they want to, says Uncle Ez, but by ginger, th' secret dies with me.

"COMPARE the monkey with the bee. The bee has personality. It has an object in life. The monkey is a scatterbrain, because he has only himself to think about."—Monthly Bulletin of the Chamber of Commerce of Hoboken, N. J., Sept. 1918.

"I should like to try wintering with frames crosswise of the hive. It sounds reasonable, and I will try it out."—D. G. Holtermann, Brantford, Ont., Canada.

"Have had two colonies in our back yard for the last five years and never a summer swarm and never a winter loss until last winter when two mice squeezed in and ruined one colony. However this is educational to me. I thought I knew a mouse's limitations before; but I surely do now and there will be no more mice nests inside the hives. Our one hive went thru the winter in fine shape and has made over 200 pounds of clover honey."—I. T. Rowland, Albany, N. Y.

"We have about 240 colonies, and run most of them for comb honey, altho more extracted honey is produced here in the Yakima Valley than comb. This climate is very changeable, the temperature going below zero in winter, and away up in the 90's in the shade in summer. Between times we have great windstorms in which the bees are killed by the wholesale when coming home loaded with nectar. In the winter I have only a chaff cushion in an empty super over the brood-chamber and a piece of canvas over that with an entrance made smaller of course."—Victoria Becker, Yakima County, Wash.

"Last summer I carried your little one-frame observation hive with me for four weeks while I lectured in Ohio teachers' institutes. At the Hotel Secor in Toledo I was followed by detectives who thought the little hive was an infernal machine intended for purposes of destruction. I was told the next day that as many as nine persons had been in my room at one time inspecting what seemed to be a dangerous proposition. Among them was the manager of the hotel and the house detective. They did all this in spite of the fact that the name, 'A. I. Root Co., Medina, O.,' was printed on the hive."—W. A. Matheny, Athens, O.

"Your Gleanings should have much credit from this locality, as it was at least partially responsible for the organization of our local beekeepers' association for mutual benefit, with the result that local prices advanced 6½ cents per pound in five days after the association first offered honey in car lots. At the beginning of the season some contracts were made as low as 10c per pound, and the Utah car-lot buyers unani-

BEES, MEN AND THINGS

(You may find it here)

mously bid 15c f. o. b. In the five days prices advanced from 15c, our best offer received in the association meeting from a car-lot representative, to 21½c,

but no sales. The association eventually sold 100,000 pounds at 25c f. o. b. Utah. On account of bad weather and roads they are holding some that was not delivered for the same price, 25c; and, as the quality is strictly fancy, the selling committee feel that the honey is well worth the price asked."—John A. Cronk, Myton, Utah.

"Mind you, I do not say bees can not hear; but I have been quite a close observer for nearly 40 years, and I am still awaiting evidence that they can. When those wonderful aluminum combs supersede the combs constructed by the bees strictly in accordance with the laws of their Divine Creator, then I will believe that bees can hear. But, really, what is the difference whether they can hear or not except for our satisfaction of knowing? It is the honey they are after (and they do not find it by following the 'come-on, girls,' tone of field workers), and that is what we are after also."—Elias Fox, Juneau County, Wis.

"All writers appear to condemn Heurth's Punicus. I have tried them now on a large scale for five years, and have obtained 10 times the crop and 30 times the unfed increase that I used to get from natives. Indeed they have been my staff during this awful epidemic among bees. Can you not appeal for a fair trial of them? Prejudice dies hard, and Cowan's verdict was on the surface a true one. They have some grievous faults, but they are a most wonderful bee. I have tried many thousands of them, and can speak with some confidence."—C. B. Bartlett, Barley Park, Oxon, England.

[The writer claims to be the largest beekeeper in the British Isles.—Ed.]

"I winter my bees outdoors in standard ten-frame hives. I have my colonies on a stand 18 inches from the ground, stand holding 10 colonies, and tight against each other for winter. I remove all the tops to get them as close as possible and cover the entire 10 with one cover made in the same way that the ordinary metal cover is made. I place above the frames a small lattice-framework consisting of five strips of ¾-inch wood, which cover about seven frames, with the cross strips turned down so as to give the bees access from one frame to another across the top of frames. Over this I place a super with a burlap bottom and fill super with cut straw or hay, and my bees generally come thru O. K. and I have them working in the supers during apple-blossom time."—Otto J. Spahn, Westchester County, N. Y.

DR. E. F. Phillips, with his force of Government Extension Workers, will co-operate with the various extension divisions of the following States,

on the dates given, in putting on extension short courses for commercial beekeepers, as follows: Purdue University, Lafayette, Ind., the week beginning April 7; Iowa State University at Ames, the week beginning April 14; Minnesota, at University Farm, St. Paul, the week beginning April 21. These short courses will be given for the benefit of commercial beekeepers, the same as the short courses recently given in California and at Ithaca, N. Y., with such marked success. The tuition in the several courses is free to all residents of the several States. Dr. E. F. Phillips and George S. Demuth, of the Apicultural Division, Bureau of Entomology, Washington, will be in direct charge and will be chief instructors in the courses to be given. No commercial beekeeper in any of these States can afford to miss the course offered them, because of its proved value. We would refer our readers as to the benefits of these commercial beekeepers' courses to what R. F. Holtermann, one of the best beekeepers anywhere, has to say in this issue of Gleanings of the same course given at Ithaca.

* * *

B. F. Kindig recently conducted a short course for beekeepers at the Michigan College of Agriculture with great success. It is said that this short course was the most popular of any of the apicultural short courses offered at the Michigan College this year.

* * *

Many of the beekeepers and beekeepers' associations of Ohio are seeking affiliation with the county farm bureaus now established in almost every county in the State. This move is one that may well have the attention of beekeepers in any county wherever there may be an agricultural county agent.

* * *

The Dixie Beekeeper is the name of a new apicultural journal to begin publication at Waycross, Ga., Apr. 1, devoted to Southern beekeeping, with J. J. Wilder as editor and publisher. Mr. Wilder announces his proposed journal as "the only bee paper published in Dixie." There is a field for this new journal, and Gleanings extends its heartiest wishes for its success and the benefit it can bring to Southern beekeeping.

* * *

Elton Warner, for 20 years a beekeeper in Porto Rico, is now transferring his beekeeping activities to North Carolina and upper South Carolina, where he will have a thousand colonies the coming season. He is a successful and practical beekeeper along



modern and progressive lines, and his faith in the beekeeping possibilities of the section of the country to which he is moving clearly indicates the great

possibilities for better beekeeping now so rapidly advancing in the southern part of the country.

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In a statement issued to the members of Michigan Affiliated Beekeepers' Association Secretary B. F. Kindig states that there are approximately 40,000 beekeepers in Michigan, who on an average produce annually 10,000,000 pounds of honey.

* * *

The 28th annual meeting of the Connecticut Beekeepers' Association will be held in the old Senate Chamber, Hartford, on Apr. 5, beginning at 10 a. m. A very practical program has been prepared, and every Connecticut beekeeper, who can, should attend. L. Wayne Adams, 16 Warren St., Hartford, is secretary.

* * *

The Ontario Beekeepers' Association has prepared a list of pound-package shippers of bees, with prices, for distribution to its members. The Association wrote to Southern queen-and-bee-rearers, asking for quotations, and asking how well prepared they might be to ship bees to the Ontario beekeepers, and if they could guarantee delivery in good condition. The Association assumed responsibility to the shippers for any orders placed for its members by the Association.

* * *

Frank Benton, for many years prominently identified with the beekeeping industry of this country, and for a time head of the apicultural activities of the Department of Agriculture at Washington, died at Fort Myers, Fla., Feb. 28, where he had gone for the benefit of his health. His home was at Coldwater, Mich., where he was born July 5, 1852. From his childhood he was an enthusiastic beekeeper and student of apiculture. He spent 12 years abroad, living in Cypress, Beirut, Syria, Germany, and Austria, investigating the different races of bees in those foreign countries, and shipping them to all parts of the world. During his administration of the Department of Apiculture at Washington he occupied very much of his time in the investigation of the various kinds of bees, and traveled much abroad in this work. He was especially interested in the big bee of India, the *Apis dorsata*, and tried to acclimate them in this country. His administration of the department was a stormy one, but today no one questions the right purpose of his great enthusiasm, and his devotion to the cause and advancement of beekeeping.

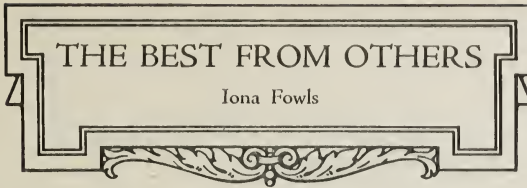
FEELING the need of scientific investigation concerning many of the problems that confront beekeepers, the Texas beekeepers, so states the Beekeepers' Item, are asking the passage of an experimental-apiculture bill. In speaking of the need of such a bill, reference is made to the fact that Texas has about 600,000 colonies, and produces about 15,000,000 pounds of honey annually; also that this State has more colonies than any other; that one-fifth of all the bees west of the Mississippi are in Texas; and yet that nearly two million dollars' worth of honey is imported into Texas annually, notwithstanding the fact that twenty times the number of colonies could be kept, and twenty times the amount of honey produced, if Texas beekeepers were educated to take advantage of their opportunities.

* * *

LARGE AND SMALL DIVES.

The large and the small hive is discussed by Miss Emma Wilson and Frank Pellett in the March number of the American Bee Journal. Mr. Pellett's view of the question is hardly to be questioned. In fact, he makes the same argument as does Dr. Miller in January Gleanings. However, inasmuch as he has somewhat misquoted me, I will repeat what I stated in Dr. Miller's department—that for those who neglect their bees there is little doubt that the ten-frame hive is preferable to the eight-frame for wintering; but for those who attend to supplying their colonies with stores in the fall (which, it is to be hoped, the great majority of our readers do) I believe colonies may be wintered warmer and cheaper in an eight-frame hive or in a ten-frame contracted to eight. And now I might add that all the colonies I own are in ten-frame hives; and, if I ever change the size, it will be to get a larger hive, or at least a larger brood-chamber.

The points Miss Wilson makes, however, in favor of the lighter supers are very well chosen. She rather takes E. R. Root to task for advocating thirteen-frame hives. (It is quite certain that Mr. Root had no intention of recommending the thirteen-frame hive for general adoption. He will doubtless state his position more fully in the near future.) She says that even if the thirteen-frame hive were piled five high, and the eight-frame eight high, which would give the same capacity, it would still be about as easy to remove the supers from the eight-frame as from the thirteen-frame; for, tho it would be handier to lift the three supers from the high eight-frame hive than the two top supers of the thirteen-frame hive, still this extra work would be offset by the greater ease in removing the remaining five of the eight-frame supers than the three of



the thirteen-frame supers. In the second place, Miss Wilson thinks that in the majority of cases the supers are not piled as high as this. She further calls at-

tention to the times the brood-chamber must be moved to a new stand or down cellar and out again. In these cases, she says, the lifting is 62½ per cent harder with the large hives than with the small. Last of all, she says all discussion along this line is quite idle for those women who simply can not lift a thirteen-frame hive at any height.

A great many of us would not care to use an eight-frame hive at all; and yet these same arguments that hold in regard to the thirteen-frame and eight-frame hive will hold also, tho in less degree, to the thirteen-frame and the ten-frame. Those who wish to save themselves too much heavy lifting, and yet are interested in a large brood-chamber may find themselves quite contented with a two-story ten-frame brood-chamber in the spring. Others may perhaps like to try out a few colonies on Harry Hewitt's plan, as given in the last issue of Gleanings.

* * *

INTRODUCING VIRGINS.

Virgin queens even eight or ten days old may be easily introduced, claims Ray Moore in the American Bee Journal for March. He takes two frames of bees from several colonies and shakes them into a cage and places them in a cool dark cellar and leaves them about 24 hours. Then he prepares small six-inch cubical boxes with 1 by ¾-inch screened entrances, each box containing a section of honey and the two empty sections. Into these boxes he shakes about half a pint of bees sprinkled with water, and also shakes in one of the virgins and closes the hive. The next day the screen is removed, and in about a week the queen is laying, when she is introduced to a stronger nucleus.

[Mr. Pritchard introduces virgins up to four or five days old in about this way; yet he prefers to get the bees to make up the nuclei from an outyard, for otherwise some of them return. He would not care to keep them in the cellar for 24 hours, preferring to use them as soon as convenient after making up; for hungry bees, he finds, are more apt to ball a queen.]

* * *

VALUE OF DOUBLE WALLS.

In discussing the double walled hive in the February issue of the Canadian Horticulturist and Beekeeper, G. A. Deadman says: "By using two boards ¾ inch thick and a dead-air space of about ¼ inch or two quarter-inch thick and a dead-air space of ⅜ inch, you have a hive that will be of the same dimensions as the single-walled, re-

quiring no more lumber and being lighter in weight. Had I then known what Mr. Dnnn tells us regarding the cork dust he uses, I certainly would have made allowance for that, and saved the work of packing in the fall and unpacking again in the spring. A double-walled hive is preferable if only a dead-air space of $\frac{1}{8}$ inch, whether you re-pack for winter or live in a climate that, so far as cold is concerned, requires no packing.

"I simply have the grain of the wood run perpendicular for the inside wall, and horizontal for the outside. By doing this I have a hive that never varies so far as the depth inside goes, and so the distance below the frames always remains the same.

"You may call me a crank on this double-wall business if you like; but I have such a strong conviction of its superiority that I have even my supers double-walled at the sides. The ends I leave single, as I get more frame space. You can not go around my apiary after a frosty night and locate the cluster of bees by the moisture on the cover, as my covers are double-walled, as also the movable bottom-board."—Canadian Horticulturist and Beekeeper, February.

SCHEME OF GRADING HONEY.

A scheme of grading honey in 12 grades according to color has been copyrighted by Tarlton Rayment. The plan is given in the January issue of the Apicultural Journal. To secure standards for the different colors, small glass vessels of equal capacity were filled with different grades, and a water-color painting of each was made. The result was 12 colored diagrams made up of four groups of three each—yellow, golden, amber, and brown, each of the four groups being made up of the three tones—pale, medium, and deep. The yellow grades are designated as Y1, Y2, Y3, and the golden G1, G2, G3, etc. A. J. Wheeler believes this color scheme too complicated, and would reduce the number of grades to three—light (A), medium (B), and dark (C). Also, since the printed diagrams would so easily fade and become soiled, he would use colored grading-glasses. One thickness would give the lightest shade permissible for medium; two thicknesses the darkest shade for medium; anything lighter than one thickness would be A; any honey of shade between that of one and of two thicknesses would be B, and any shade darker than the shade of two thicknesses would be C.

[H. H. Root has been experimenting with various colors of glass, and finds that one can, in this way, obtain satisfactory and permanent standards.]

THOUSANDS OF COLONIES SHIPPED INTO CALIFORNIA.

Several thousand colonies are being shipped into Riverside and San Bernardino counties, Cal., from Utah and Idaho, some for honey production, but many for increase and early queens to be shipped north for

the alfalfa and sweet-clover crop. Chas. S. Kinzie, in the February Western Honeybee, is not overly pleased at having the good roads worn out by these intruders, and the California beekeepers crowded off their ranges. He suggests a license tax of 25 cents per colony on all imported colonies.

DISAPPEARING DISEASE DISCUSSED.

In a report of the Ontario Beekeepers' Annual Convention in the February Canadian Horticulturist and Beekeeper we find the following: "The subject of the disappearing disease, or bee paralysis, came in for considerable discussion. Considerable difference of opinion as to its cause was expressed." When asked if he had noticed any difference between the disappearing disease and bee paralysis, Mr. Stewart said they were similar in their symptoms, but he could go no further than that. He said that he noticed the disease 20 years ago.

CAUSE OF HOLES IN CORNERS OF COMBS.

"Just learned something thru the glass hive in my office. I had four sheets of paper over the glass. There was a nail-hole thru the paper, and it made a little spot of light on the outside comb. The bees promptly gnawed a large hole thru that comb. That accounts for the combs down in the brood-nest being eaten away at the corners."—Chas. S. Kinzie in February Western Honeybee.

"DR." E. R. ROOT.

"'Dr.' E. R. Root, editor of Gleanings in Bee Culture, the leading bee-periodical of the world, is spending the winter in Los Angeles, and is giving much time to bee demonstrations before various organizations. He has acquired the title of 'Doctor' since his appearance here, and his bee-stunts are certainly doing much to popularize and arouse interest in beekeeping."—February Western Honeybee.

LIGHTNING OPERATOR.

To take care of 500 or 600 colonies, and do all the extracting alone, and with a two-frame extractor taking over a ton of honey a day, is quite a stunt; and yet, we infer from the February issue of the Western Honeybee, this has become a sort of habit with O. W. Stearns of Selma, Cal.

TO PREVENT FOUNDATION STICKING.

To keep foundation from sticking to the board when using a wire-imbedder, A. E. Lusher, in the February Western Honeybee, states that he uses cornstarch, talcum powder, or soapstone. [Of these three we believe cornstarch preferable.]

RESTOCKING FOR ISLE OF WIGHT.

Nearly 100 colonies believed to have a considerable degree of immunity from Isle of Wight disease, have been distributed among beekeepers in Scotland during the

(Continued on page 265.)

QUESTION.—
In an article by Frank C. Pellett on beekeeping, he says if the queen is lost when there are no larvae or eggs from which to raise another queen, the colony is doomed.

In another place he says that in the spring if one finds the queen dead, he may purchase one and replace her. Then why could he not do this any time during the season if the queen is lost and there is no chance of rearing another?

New Jersey.

Mrs. F. B. Shaffer.

Answer.—That is exactly what he should do. Mr. Pellett simply meant that, if no queen is provided, such a colony is doomed.

Question.—Would not old kid gloves be better to handle frames with than brown duck or canvas bee-gloves?

Ralph Gaston.

Pennsylvania.

Answer.—No. In our experience kid gloves are much worse than nothing. It is very awkward to work in the apiary with gloves of any kind; but, if gloves must be worn, we advise very loose canvas gloves.

Question.—Would it pay to try to keep pure Italians in a thickly settled district where everybody keeps black bees in box hives?

Indiana.

S. E. Troxel.

Answer.—Yes, it certainly would pay you to keep good Italians. In your location this will mean that in mating you will sometimes get hybrids. However, a strain of bees from an Italian queen mated to a black or hybrid are nearly always good honey-gatherers, and often the first cross are better at honey-gathering than either of the original strains.

Question.—I looked in my hive, and part of the comb in the brood-chamber is quite dark. What is the cause of it, and what shall I do?

North Carolina.

H. C. Fox.

Answer.—The dark color of the combs need not worry you in the slightest, for the dark combs are those which have been in use for a long time in the brood-chamber. The older combs become, the darker they are; but, contrary to the belief of some, we do not think that age lessens the value of combs at all. In fact, we rather prefer the old combs. They certainly are warmer during the winter, since the cells are lined with many layers of cocoons. Not only do we prefer old combs, but the bees also show the same preference.

Question.—When I purchased my colonies last spring I placed them on a bench about two feet from the ground, with the front about an inch lower than the rear. Is my plan wrong? Should my hives be nearer the ground?

A. H. Gilmore.

Pennsylvania.

Answer.—You would, we believe, like it better to have your hives down nearer the ground. They should not, of course, rest on the ground, but be high enough up to be away from the dampness. They may rest on bricks or on 2 x 4's, or on a regular hive-stand which one can easily make. When hives are placed on stands or benches of



some height it necessitates much more lifting during the honey flow; also, if the colony is wintered outdoors, it is probably not as warm as it is

when closer to the ground.

Questions.—(1) When bees start to swarm, and the queen is caught in a wire Alley trap, will the bees return to the hive? (2) If you let the queen loose from the trap will she swarm? (3) Is it wise to leave the wire Alley trap on all the time? (4) Will all the bees go thru a bee-escape? If so, how long will it take? (5) Can the drones be caught in a wire Alley trap?

New Jersey.

Clyde R. Lumadue.

Answers.—(1) Yes, they will return; but the proper thing to do when they swarm is to move the old hive to a new location and put on the old stand a hive with empty combs or frames of foundation. In a short time the swarm will return, and, if the queen is then given them, they will enter the new hive and probably remain contentedly. (2) The colony will usually swarm again the following day. (3) No. It would seriously interfere with the workers carrying in honey and pollen. (4) The bees will usually all leave a super in 24 to 48 hours, if it contains only honey; but, if it contains brood, the bees would not leave it. (5) Yes. That is the principal use of the trap.

Question.—Can you give me any information about stingless bees?

New Jersey.

H. Ritter.

Answer.—Stingless bees may be found all the way from the southern part of the United States to certain parts of Argentine. There are probably over 100 species, which vary greatly in size and habits. There may be from 100 to 100,000 in a colony. Some of these live in the ground, others in trees. The natives sometimes keep stingless bees in hollow logs, but seldom secure more than a gallon of honey per hive. Ordinarily the bees may be handled without veil or other protection; but when unduly stirred up they may be very cross, crawling into the ears, nose, and hair, and biting most viciously.

Questions.—(1) If one uses the Alexander method, would it not be a good plan to let the new colony on the old stand produce comb honey while the parent colony produces extracted honey? (2) If one captures the virgin queen from an after-swarm, why does the swarm insist on hanging to the limb instead of coming back to the hive? In every case our first swarms (led by a clipped laying queen) has returned within 15 minutes, while those led by virgins refuse to come back. (3) Would copper wire take the place of tinned wire for wiring frames of foundation?

New York.

Raymond Russell.

Answers.—(1) If either one of the colonies is to produce comb honey, the parent colony should be chosen. However, no comb-honey production should be attempted unless the colony is very strong. (2) If the colony persists in hanging on the tree after the virgin queen has been captured, it is

probable that another virgin is present. There are often several queens in a cluster. If only one were present, the swarm would in a short time leave the limb. They might cluster for a while, but would eventually return to their hives. (3) Copper wire may be used instead of tinned wire for wiring frames of foundation; but it stretches a little more readily than the ordinary wire, and is, therefore, harder to keep tight. Also, if the wire is to be imbedded by means of electricity, it takes more current to imbed the copper wire owing to the higher conductivity of copper over iron.

Question.—I have been working for the State as apiary inspector, and my experience is that in every case where there is an apiary that has been well supplied with salt around the front of the hive to prevent what is commonly called ants there is no foul brood. I know of different apiaries that are located very close to foul brood, yet where there is salt placed in damp places there is no foul brood. I have never had foul brood in my apiary, and I always use salt for the bees to work on. I am sure salt is a preventive. L. D. Sharp.

West Virginia.

Answer.—We have known of others who held a similar view, yet our own experience has not borne this out. We use salt in front of our entrances in order to keep down the grass. Some years we have no foul brood, other years two or three cases may appear, quite regardless of the presence of salt. In this one apiary to which we refer there is no question as to how the bees contract the disease, since we have a kind neighbor who keeps us from time to time supplied with this disease. We can not see that salt has any effect on foul brood, either as a cure or as a preventive.

Question.—It will be impossible for the next year or two to visit my bees more than twice a year. They are in 12-frame hives. When I packed last fall they had plenty of stores for an ordinary winter. What I am worrying about now is that this exceptionally warm winter will start brood-rearing early, and so make them run out of stores before fruit bloom, and still I am afraid to unpack before fruit bloom for fear of chilling, especially as it will be necessary at that time to give empty supers. Massachusetts. Oscar B. Perkins.

Answer.—How splendid it would be if bees could be as easily taken care of. Yet we do not consider it possible to take good care of colonies by opening the hives only twice a year. The problem that now confronts you is similar to many that will follow if you find it necessary to give your colonies such scant attention. If they now need stores it would, of course, be disastrous not to feed them, and yet it is quite evident that it would not be safe, at this time, to give them all the surplus room they may need thruout the summer. If not able to visit the bees oftener, we wonder if it would not be possible for you to get some one in the immediate neighborhood to give the supers when needed. In most cases those who have tried managing their bees with less work than is usually considered necessary have hired some one near the apiary to do certain things at the necessary time. In this way only, and only in localities free

from disease, do we think it possible that you can make a success of let-alone bee-keeping.

Question.—Can I start a colony of bees with a two-pound package on just frames with foundation? If not, what is the smallest amount of empty combs I can use? J. D. Dietrich.

Michigan.

Answer.—These nuclei could be given frames of foundation, altho combs are greatly to be preferred. We advise giving at least one comb to each nucleus if sufficient combs can be obtained. It will, of course, be necessary to feed a cup of syrup daily for a month or more, according to the directions that accompany the packages.

Question.—I should like to know the value per year to bee culture of a hundred fine basswood trees. They were grown in an open wood with ample room, and are very wide-spreading. The owner is contemplating clearing them up, but the wife wishes to preserve them for sentimental reasons. If they are of sufficient value as bee-forage, the husband might be induced to save them. Mrs. Charles Dean.

Indiana.

Answer.—We can give no exact statement as to the number of pounds of honey those trees would yield. But here at Medina one year, when conditions of heat and humidity were just right, we had an average of over 14 pounds of basswood honey per day for three days; and there is on record a colony in New York that for ten days stored an average of over 30 lbs. per day from basswood alone. As a general thing one would expect much less honey than this from basswood, and yet we assure you that 100 basswood trees would be a valuable asset for any beekeeper.

Question.—One of the local stores recently had some comb honey on sale in square boxes which were spotlessly clean but did not have the appearance of having been scraped. I use the Danzenbaker sections, but find they need considerable scraping, and even then the stains are not entirely removed. Can you suggest how I may eliminate my trouble? Julius C. Bechtel.

New York.

Answer.—Some strains are more liable to propolize the sections than others. Possibly by requeening you could improve this condition. Aside from this we know of no way to keep the sections cleaner other than to keep very strong colonies, leaving them rather crowded for room, so that the sections may be finished as fast as possible, and removed as soon as the cells are completely capped. Of course, if sections are left on the hive for any length of time they soon become soiled and injured in appearance; and, if too many supers are given at one time, it takes the colony too long to complete their work, and the sections become travel-stained.

ANSWERS BY DR. C. C. MILLER.

Questions.—(1) To every quarter section of land we have about 20 acres of pasture with a light crop of white clover, about 5 acres alsike, about the same amount of red clover, also some of the clovers scattered along roads and fences. In the spring we have lots of dandelion, a few locusts, and about 15 apple trees to each farm. In the fall we have goldenrod and asters scattered along the fences, and

lots of catnip in the groves. Can I keep a hundred colonies in one apiary? (2) My bees are in a cave with only the inner cover on top. These seem to warp up on the sides so there is a crack of about a quarter of an inch with fully a $\frac{3}{8}$ -inch opening in front. Will this be all right for the bees? (3) There is a little mold in the cave. Will it do any harm? (4) If I put some bees in the hives, with foundation, how much should they be fed to draw out the combs when there is no natural honey coming in? There is about three pounds to the swarm.

Iowa.

Answers.—(1) It is hard to speak with definiteness about such things, but I should count it quite a safe thing to have 100 colonies in one apiary in such a place. (2) That $\frac{1}{4}$ -inch crack will do good, and likely make the ventilation of the hive all right, provided the ventilation of the cave is all right. (3) A little mold will do no great harm, although it would be better not to have any. The mold and the warping of covers indicate dampness and lack of ventilation. Perhaps you can increase the ventilation. It is also not unlikely that the cave is too cold. If below 45 or 50 degrees, warming up a little will help both as to dampness and ventilation. (4) I don't know definitely. Counting that no drawn comb is present in which the syrup can be stored, I should guess that a pound a day of equal parts of sugar and water might do, and that more would make faster work if the bees will take it. This answer is subject to modification by any one in the office of Gleanings who is not as ignorant about it as I am. [From our experience this would depend greatly on the temperature. We should guess from one to two pounds a day.—Editor.]

Questions.—Please pardon me. I do not come criticising nor dictating, but merely seeking information based upon facts. (1) On page 23, January Gleanings, in regard to field bees carrying honey to the top super of a hive containing five or six supers, would the fact of the bees unloading their pollen in the brood-chamber, where they know it is required, be any evidence that they do not carry their loads of nectar far above, where they also know it is required, and that there is room for it? (2) If, as you seem to think, the field bees merely carry the nectar in and dump it into empty cells in the brood-chamber where the young bees take it into their sacs and evaporate by thrusting it out with their tongues, then I should like to have you explain how they can do this when the brood-chamber is already filled with honey and brood; and, if such might be the case, how do you account for the nectar being so thin that you can shake it out of the combs by hand, or even have it drip out by turning the comb on its side after this imaginary evaporation, and storing in the topmost super? (3) In the same issue, page 24, you say that at the approach of winter the 10-frame hive would have two frames more of honey than the eight. Yes, they would have at least two "frames more," but not always two frames more of honey; but conceding this to be a fact, would they not normally also contain proportionately more bees? (4) On the same page you tell us the three varying temperatures of your cellar, yet you failed to tell us what the month was at the time this test was made, what the outside temperature was, what the condition of the bees was as to quietness, and whether the three tests were made with three different thermometers (which I presume was the case). If they had not been tested together, is it not possible

that they too may have varied, at least slightly? (5) I should also like to ask if you or any one else can tell me about what the winter loss by weight in dead bees should be in 135 colonies, mostly 10-frame, in the cellar, being confined from Nov. 23 till April 6, dry cellar, and covers and oilcloths on the hives—a winter, say, like the one a year ago, all but one colony coming out alive? Elias Fox.

Wisconsin.

Answers.—(1) You are quite right that the fact that bees unload their pollen in the brood-chamber is not proof that they unload their honey-sacs there. It was a poor attempt at proof. (2) You ask how the bees can unload their sacs in the brood-chamber when said brood-chamber is already filled with honey and brood. There are cells partly filled with honey that offer some room. Then each day there are young bees emerging from their cells, into which cells the fielders can temporarily thrust their honey. If there is not room enough in the brood-chamber, there is no law against using the nearest cells to be found in the supers. At any rate the thin liquid is there, in the brood-chamber, as you can easily satisfy yourself, and if the fielders didn't put it there, who did? You ask how to "account for the nectar being so thin that you can shake it out of the combs by hand." That shaking business is really a proof that the fielders dump their loads in the brood-chamber; for the brood-combs are the very ones where the honey shakes the most. Indeed the first delightful proof that the bees have begun to bring in a surplus is when upon shaking the bees off a brood-comb we cry out, "The honey shakes." Anyhow, there's the thin stuff in the brood-chamber. Don't you think the fielders put it there? There's another proof that has been brought forward. Into a colony of dark bees introduce a light queen. Then a few weeks later, when the old bees have all become fielders and the nurses are all light, take the cover off the top super and see the color of the bees in it. Few or no dark bees there, but lots of yellow ones, showing that the young bees are the ones that bring up the honey. I think I ought to add that most of what I have here said I should credit to that close and reliable observer, the late G. M. Doolittle. (3) As to there being more stores in a 10-frame hive in proportion to the number of bees, ask any observant inspector in which hive he finds the most starving, and also read what Miss Fowls says on page 24. (4) When I gave the temperature at three different points in the cellar I didn't report upon the things you mention, and it didn't occur to me that any one would want to know. As to thermometers, I used the same thermometer, taking the temperatures in immediate succession, making it practically at the same time. (5) I don't know the answer to this question.

C. C. Miller.

I arise to remark to ye editor or any one of his fellow-conspirators that I'm glad Mr. Fox didn't "come criticising." If he should come in a really critical mood I'm afraid it might go hard with me.

C. C. M.

SOME time during maple bloom or fruit bloom there will doubtless be a wonderful spring day when the entire apiary will be vibrating with the music of humming bees. Then is an ideal time to become acquainted with those fascinating little friends that have impelled us to a reading of these pages.

Preparing to Open the Hive.

Armed with a good bee-veil and lighted smoker, and bearing in mind that bees seriously object to sudden jarrings and quick motions, it will be found that, if our directions are followed, good Italian bees may be quite safely handled, even at the first attempt.

On approaching the hive give one or two gentle puffs of smoke at the entrance, just to inform the ever vigilant sentinel bees stationed there whose duty it is to protect the colony from sudden attack, that, tho their hive may be unavoidably jarred during the next few minutes, it would be well for them not to be too highly sensitive, since the intruder is well prepared to defend himself—with smoke.

A Glimpse Within.

Working from the side of the hive, carefully remove the outer cover and insert the edge of the hive-tool in the crack between the ends of the inner cover and the hive and gently pry the cover, breaking the propolis with which the bees have cemented the cover to the hive. Then lift the front end of the cover a quarter of an inch or so from the top of the hive, at the same time blowing a gentle puff or two of smoke over the tops of the frames. This will drive many of the bees from the tops of the frames down on to the combs, where they will immediately dip into the cells of honey and proceed to gorge themselves, after which they will be very docile and easily handled. Even those not gorged with honey will still be enough confused by the smoke to prevent their acting in accordance with their natural instinct to protect the colony.

Handling Frames.

After removing the inner cover select for inspection first the second or third frame from the side, where the queen is less likely to be found, for if the queen should be on the first frame removed she might possibly be injured by being rubbed or crushed when the first frame is withdrawn from the closely adjacent frames. Now place the curved end of the tool between the ends of bars and gently pry one frame loose from its neighbors. Also loosen the opposite end, and, with the curved end of the tool, lift the frame just enough so that the fingers of the left hand may easily grasp the end of the top-bar. Then take the opposite end with



the right hand and slowly lift the frame straight up, holding it always in a vertical position.

If one wishes to turn the frame over and the right hand and slowly lift the frame over and look at the opposite side, it should not be turned directly over with the bottom-bar remaining horizontal; for, if the comb is heavy with honey and insecurely attached, it may break from the frame. Moreover, if a frame is held horizontally, it might result in the queen's fall and injury, for a laying queen is quite easily dislodged from a comb.

As the frame is held by the ends of the top-bar perpendicularly in front of one (see Fig. 1), raise the right end above the left,

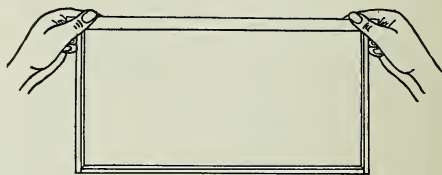


Fig. 1.—First position of frame.

thus bringing the top-bar into a perpendicular position (see Fig. 2); then revolve the frame on this perpendicular axis until the opposite side is toward the beginner (see Fig. 3), when the right hand may be lowered to a position level with the left hand,

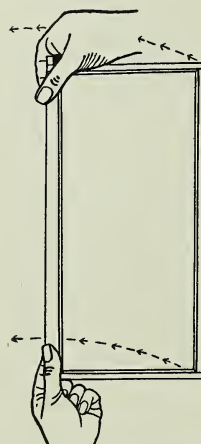


Fig. 2.—Second position. Arrows show direction in which the frame is now to be turned.

leaving the frame still in a vertical position, and still held by the ends of the top-bar; but the bottom-bar, now at the top (see Fig. 4) instead of at the bottom, as in the original position. In order to get the frame in the right position for returning to the hive this operation should be reversed. This manner of handling may sound rather involved and quite unnecessary; but in reality it is very simple, and may save the beginner a broken comb or the loss of a queen.

Practice it with an empty frame. To make room to work place the first frame removed to one side in a box.

Keeping Bees Under Control.

After working a few minutes at the hive, many bees will probably come up on top

of the frames. If they move about contentedly, paying but little attention to the beginner, there will be no further need of the smoker; but if one notices a row of heads sticking up inquiringly between the frames, each bee apparently alert, just waiting for a signal to dart at the operator, or if one observes quick sudden moves of the bees on top of the frames, and perhaps an upward curving of the abdomen with the point of

the sting protruding, then it is full time to resort to the smoker. The bees, however, should not be smoked too vigorously. A few gentle puffs is all that is necessary.

Three Kinds of Individuals in the Hive.

As one watches the bees on the frames he will find the individual bees going this way and that, sometimes crawling over each other, but usually crowding their way in between those that happen to block their way.

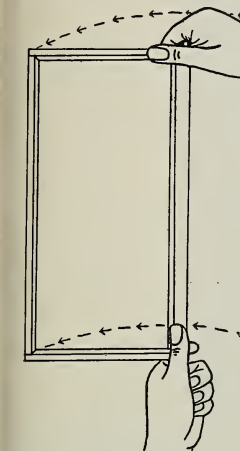


Fig. 3.—Third position. Arrows show direction from which the frame has just been turned.

Those thus crowded show no resentment, but quite graciously grant a momentary gangway, in this respect showing themselves vastly superior to human beings. The great majority of these bees are like those the beginner has frequently noticed on flowers

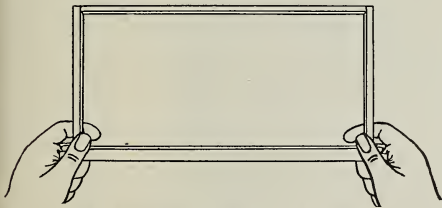


Fig. 4.—Fourth position of frame.

in his garden. They are the workers, or honey-gatherers, and are undeveloped females.

Here and there among the workers may be noticed a few blunt thickset bees larger than the workers. These are the drones, or male bees, which are entirely dependent on the workers, since they are unable either to protect or provide for themselves, having no sting, and the tongue being too short to obtain nectar from flowers, altho a drone is able to help himself from cells of honey already stored by the workers.

Perhaps one may be fortunate enough to note on one of the combs a somewhat irregular circle of workers mostly facing to-

ward a large splendid-looking bee not as blunt as the drone, but much longer, and quite regal in bearing. This is the queen, the mother of the entire colony. If one watches her for a time he may notice workers softly caressing her with their antennæ, if she chances to stand still for any length of time. If the bees have been handled carefully, the beginner may have an opportunity to see the queen deposit in the cells little white eggs one-sixteenth of an inch in length. She progresses busily over the comb, apparently choosing those cells that best please her, and then, while hanging to the edge of the cell with her feet, she inserts her abdomen, curving it downward into the cell, and deposits her eggs, gluing one in the bottom of each cell.

Arrangement of Brood.

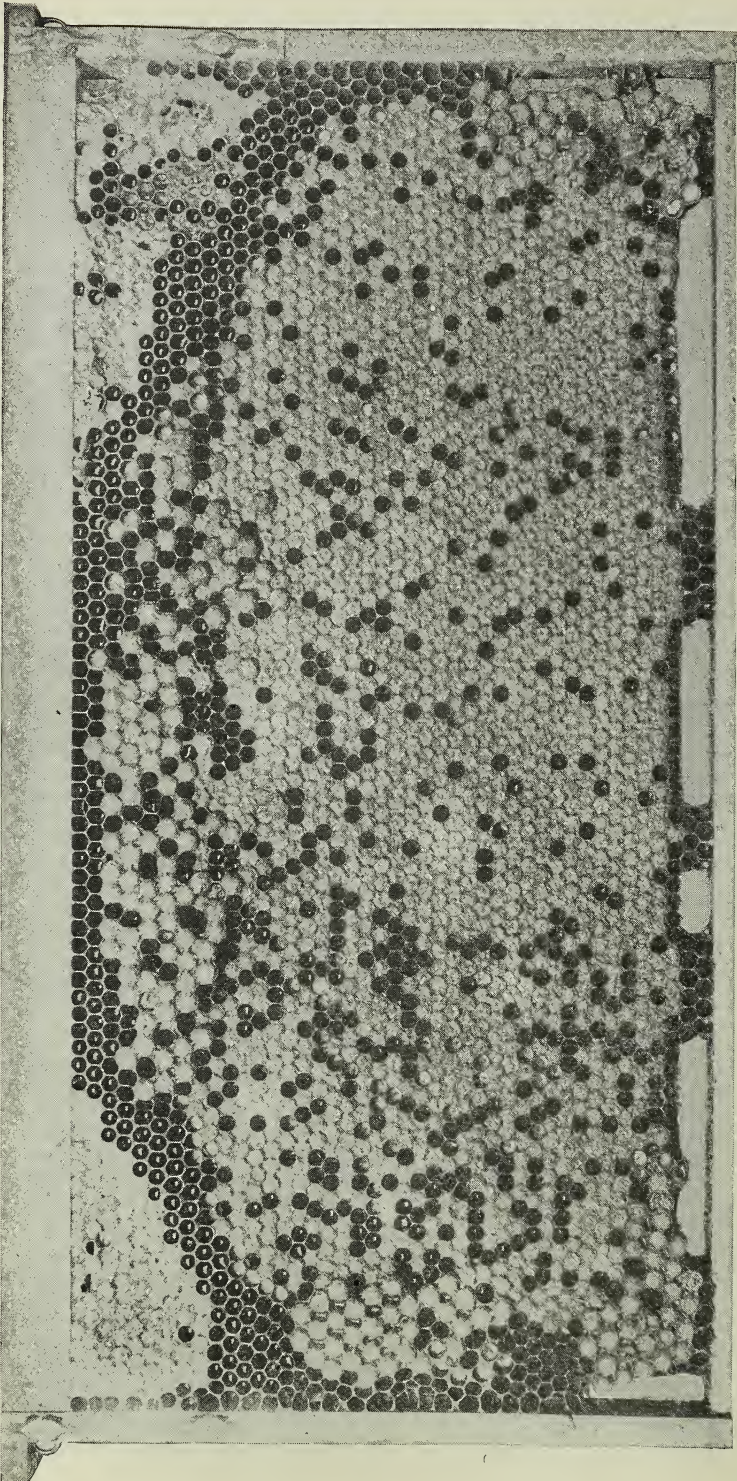
Most of these eggs are placed in cells about one-fifth of an inch in diameter, of which cells the combs are almost entirely composed. A few, however, are placed in larger cells about one-fourth of an inch in diameter. In the smaller cells are developed the workers, and in the larger ones the drones. Near the cells of eggs will be found cells containing pearly-white grubs of various sizes. These are larvæ in different stages of development. When the larvæ become large enough they spin cocoons about themselves and pass into the pupa stage. At this stage the cells have light to dark-brown slightly convex cappings made of wax and fibrous material. The cells of eggs, larvæ, and pupæ—that is, all the unhatched bees of the hive—make up what is called the "brood." That part of the combs in which brood is being reared is the brood-nest; and the entire chamber which contains the brood-nest is called the brood-chamber. In the spring, when the queen begins laying, she usually places the eggs toward the center of the hive. She lays quite regularly; and, as the little circle of brood gradually increases, similar smaller circles are started on the adjacent combs, so that, roughly speaking, the general form of the brood-nest is that of a sphere or ball.

Placing of Pollen.

Surrounding the sphere of brood, tho not arranged regularly, may be noticed cells not capped over, but containing a yellow, red, green, or perhaps dark-brown substance. This is pollen mixed with a little honey, the pollen having been gathered by the bees from flowers, and carried home packed in pellets on their rear legs. It is possible that the beginner may catch sight of some bees rushing about on the combs with these variously colored little balls, looking for suitable cells in which to deposit them. Having chosen such a cell the bee backs in, and, holding the rear legs down in the cell, dexterously removes the balls of pollen. The "beebread," as the pollen moistened with honey is sometimes called, is gathered especially for feeding the young larvæ.

Location of Honey-cells.

Just outside of the brood and beebread,



COMB SHOWING VARIOUS KINDS OF CELLS.

This frame of comb shows cells of brood and also of honey. The drone brood in the lower corners and a few other places may be easily recognized by the large convex cappings. The worker brood, of which most of the brood here shown consists, has the same fibrous, light-to-dark-brown cappings but not as convex as the cappings of drone brood. The unsealed brood is shown scattered here and there in the open cells. A few cells with small curled-up larvae may be seen on the left half of the comb. Some of the older brood is hatched out, leaving here and there empty cells, which the queen will fill again with eggs in a short time. Later on, when these cells of brood have hatched and there is no need of raising such quantities of brood, these same cells may be used for storing honey. Sealed honey, which usually has white cappings, is shown in the upper corners, and the unsealed honey is shown just above the brood and below the sealed honey. Next each end-bar will be seen a row of irregularly shaped attachment cells.

toward the borders of the combs and the sides of the hive, are the cells of honey, which may be either worker- or drone-cells. These honey-cells have somewhat flattened coverings or cappings of white, yellow, or bluish-white wax. At the edges of the combs, attaching the combs to the frames, are cells of an irregular shape called "attachment cells."

In the raising of brood great quantities of honey are consumed; and as the bees use first that honey next to the brood, the cells are generally emptied fast enough so that the queen is kept supplied with empty cells for egg-laying, and the room is supplied in the best possible place right next to the brood already started where the bees can more easily keep it warm.

Queen-cells.

In the brood-nest itself, therefore, may be found cells showing three stages of brood, eggs, larvæ, and sealed brood, while outside the brood-nest are the cells of beebread and cells of honey. These cells are classified according to their size and shape into worker, drone, and attachment cells. There now re-



Queen

Drone

Worker

(Photographed as nearly natural size as possible.)

mains one other kind of cell to be mentioned—the queen-cell. The beginner is not apt to see one at this first examination. These are present only when the colony has determined to swarm or to supersede—that is, to replace their queen with a new one. Queen-cells are usually found in a depression of an imperfect comb or along the bottom-bar or end-bar. In size and shape they are somewhat like a peanut or long slender acorn with the smaller end hanging downward.

Remaining Points of Interest.

This, possibly, describes all that the beginner will be likely to notice on his first glimpse inside the hive. He will now wish to know something of the life-history of each of the three kinds of individuals in the hive, and perhaps a little more concerning their various activities.

Life-history of the Drone.

The drone, or male bee, develops from an unfertilized egg which the queen deposits in a drone-cell. (The queen has, apparently, the power of laying fertilized or unfertilized eggs at will. The former she places in worker-cells, and the latter in drone-cells.) After three days the egg hatches into a small larva surrounded by a white, milky partially digested food called

"chyle," which is provided by the nurse bees. The larva continues to increase until the cell is sealed and a silken cocoon spun about the larva, which is now spoken of as a pupa. On the 24th or 25th day from the depositing of the egg the drone leaves the cell, and about two weeks later takes its first flight.

As previously stated, the drones are entirely dependent on the colony for their food; and whenever stores run short the workers quite ruthlessly drive them or carry them outside to starve. The assembling of drones in the grass before the hive may be taken as a certain indication of the cessation of the honey flow.

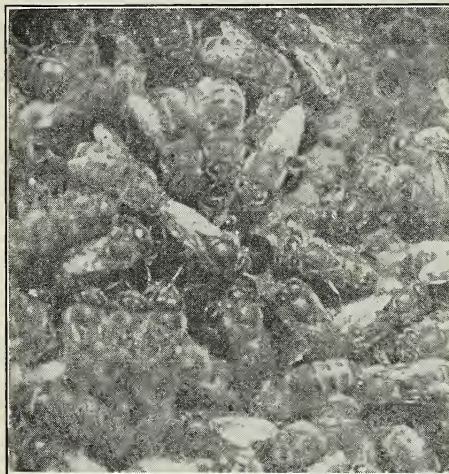
Life-history of the Queen.

When a colony for any reason, such as a deficient queen or a crowded condition in the brood-chamber or supers, feels the need of a new queen the bees begin the construction of long peanut-shaped queen-cells. After these are well started the queen deposits in each a small white egg, which after three days hatches into a tiny white larva which may be seen floating in a white thick milky substance. This chyle is more concentrated than that fed to either the drone or worker larva. (It is interesting to note that this same egg, if placed in a worker-cell, would, because of the difference in cell and food, result in a worker instead of a queen.) The queen

larva, cell, and amount of royal jelly increase in size proportionately until the sixth day from the hatching of the egg, when the cell is sealed. Up to this time the queen is still in larval form; but after sealing while in the pupal form she undergoes various changes which finally result in the adult queen. From the 15th to the 16th day after the egg was deposited, the queen, by means of her mandibles, begins cutting thru the lower end of her cocoon. If one chances to open the hive at just this time, he may see the points of her mandibles protruding thru the tip of the cell as she smoothly cuts a little round door which opens outward as she emerges from the cell.

After leaving the cell she generally helps herself to honey, and then makes a search for any other queen or queen-cells that may be present. As soon as the two queens meet, a mortal battle ensues, since a queen has no intention of sharing her glory with a rival. Also all unhatched queen-cells are destroyed, either by the queen or workers, leaving but one queen in the colony. Altho the queen has a sting, she seldom uses it except on a rival. From five to ten days after leaving the cell the virgin queen takes her wedding flight, and in a day or two increases considerably in size, and assumes a much more stately, dignified appearance. Then begins

her life duty of keeping the colony constantly supplied with plenty of bees. A good queen may lay 3,000 or more eggs daily during the breeding season, and perhaps as many as 200,000 annually for several years. Queens that for any reason fail to mate will lay; but their eggs, being unfertilized, will produce only drones. Such queens are called "drone-layers," and are quite worthless. In order that a colony be prosperous, it



Laying queen. Note the circle of bees gathered around her in mute adoration.

should always be kept supplied with a good laying queen, or at least the means of producing one; for, unless new bees are constantly coming on to replace those that are continually wearing out, the colony soon diminishes to the vanishing point.

History of the Worker.

The egg that is to produce the worker bee hatches after three days. The next three days it is fed the same kind of food as the queen larva, but in smaller amounts. Following this the worker larva is fed honey and pollen. Her development is slower than that of the queen, it requiring 21 days from the depositing of the egg to the hatching of the mature bee.

The young worker, when she first emerges, is covered with what appears to be fine, soft down, so that the beginner will have no difficulty in distinguishing her from the older bees whose down has been gradually wearing off. For a day or two she does nothing in particular except to walk about eating honey and industriously preening her "feathers." After this she takes up her duties as nurse-bee, and in this capacity partially digests pollen and honey which she feeds to the developing larvæ. She also performs other work about the hive, such as propolizing, house-cleaning, comb-building, etc. About the eighth day the worker indulges in her first flight or "playspell, making

many circling flights about her doorstep in order to drill her memory concerning the exact location of her home. In about two weeks' time she begins gathering pollen and honey from the fields. It is very interesting to watch the energy and enthusiasm with which young bees bring in their first loads of pollen and place them in the cells; also to watch others enter the cells and carefully pack the pollen in place. In the pollen-baskets on the rear legs bees may also bring home propolis with which they make tight all useless cracks and crevices about the hive.

Honey Stored and Ripened.

When returning with honey a bee enters a cell headfirst and feet upward. Then the bee holds quite still while a drop of honey appears at the mouth and touches the cell. This drop the bee slowly spreads over the cell wall, keeping the mandibles constantly in motion. During this time the drop completely covers the openings of certain small glands that quite likely help in changing the nectar into honey. While storing honey and ripening it, each bee keeps its tongue in the most unusual place, snugly folded behind the head, evidently out of the way of temptation.

The honey is evaporated, or "ripened," by the bees until it contains less than 25 per cent of water. This work is carried on mostly at night, the bees arranging themselves on the combs with heads upward, and then, forcing a drop of nectar to the mouth and mandibles, where it gently pulsates for about 10 minutes, it is swallowed and another drop appears. This honey-ripening continues until nearly midnight; and during its progress there is a most delightful drowsy humming thruout the apiary.

Wax Secretion.

During honey-ripening and the changing of nectar to honey, wax scales are secreted by eight wax glands on the under side of the abdomen. We regret that the scope of this article forbids a description of the way these thin wax scales are worked over into such beautiful thin-walled combs of such marvelously accurate measurements. This subject, we can assure the beginner, is well worth a little extra study.

Beginners' References.

Other interesting activities of the bees, such as swarming, robbing, etc., will be discussed in later articles. In our next issue we shall take up our first actual work with the colony.

This issue contains the following articles that will doubtless be of special interest to beginners:

Paragraph on "Importance of Abundance of Stores," p. 221; "Anne Lester and Daddy Lowe," p. 222; "What One Mistake Did," p. 226; "His Start With Bees," p. 229; "The Two-pound Package," p. 230; "In Texas," first paragraph of p. 239; "In Florida," last paragraph of p. 239; "Gleaned by Asking," p. 247.



OUR HOMES

A. I. ROOT

For what is a man profited if he shall gain the whole world, and lose his own soul?—MATT. 16:26.

It is better for him that a millstone were hanged about his neck and he were cast into the sea.—MARK 9:42.

As a roaring lion, walketh about, seeking whom he may devour.—I PETER 5:8.

WHEN the honey flow is suddenly cut off, from any one of sundry causes, unless the bee-keeper is on the watch, weak colonies are liable to be robbed, and when robbers get started and robbing is "on the rampage," woe betide the novice, and sometimes

the veteran also, if he does not succeed in putting a stop to it. If the colony being robbed is closed up (or, better still, carried away and placed in a dark cellar), the robbers are almost sure to pounce on the next hive; and I have known them to get so fierce as to test "the metal" of almost every stock in the yard. If it is only one colony doing the robbing, and you can be sure *which* one, these robbing "pirates" should also be put in the dark cellar. I need not go on directing what to do, for our books and journals have again and again gone over the matter in full detail. In fact, the foregoing is only a preface of what I want to talk about.

For ages past Satan has been robbing mankind of both "soul and body," and when the churches, schools, and all good people, especially the *mothers* of humanity, have talked of putting him in a "dark cellar," he has laughed us to scorn. But the "mill of the Gods" keeps on "grinding" and just now on this 28th day of January, 1919, the papers tell us that 35 States have ratified. You know all about it, dear friends. Yes, when this reaches you, far more than I do.

John Barleycorn is killed, for the U. S. and the prospect is fair for the *whole wide world*. Will Satan give up and "be good?" I fear not; see our last text. He may finally give up on "booze," but the whole world had better be on the watch for his next move. I think I have an inkling of what it is to be, from an article in *Leslie's Weekly* for Jan. 11. Here is the heading:

HOW TOBACCO HELPED TO WIN THE WAR.

The whole article seems planned with wonderful (Satanic?) ingenuity to deceive "even the very elect." I give below three extracts from different parts of the article:

According to the men at arms of the forces which brought the Prussian monster to its knees, particularly the Americans; their officers, from the highest

to the humblest; the physicians, nurses, chaplains and stretcher-bearers who labored to save the wounded and minister to the dying; the women of the Red Cross, the secretaries of the Y. M. C. A. forces, and the representatives of all the other philanthropic agencies which labored for the men battling for the cause of humanity — tobacco was one of the most pronounced blessings of the struggle, one of the

greatest factors in preserving the morale of the troops.

For December last the Y. M. C. A. ordered 70,000,000 cigarettes and nearly 3,000,000 cigars to supply the demand for "smokes" among the American Expeditionary Forces in Europe.

There may be some who believe that soldiers fight best if supplied with liquor before battle, but I know to the contrary. Tobacco was all our boys needed, and "smokes" played a mighty large part in beating the greatest military machine in the history of the world.

From the above it would seem not only "physicians, nurses, and chaplains," but even the Y. M. C. A. endorse the cigarets. Our readers know the last is not true, from what I have said heretofore.

With the progress prohibition is now making the writer admits—in fact, he is *forced* to admit that "booze" doesn't help soldiers to fight, but we have abundant information that the cigaret habit is harder to break away from than alcohol. Finally, dear friends, even if it could be proved that cigarets helped us to conquer *Germany*, how much is gained should it transpire we have hanged a *still bigger* "millstone about our necks," and about the necks of our soldier boys just in the flower of their youthful manhood.

FROST AND FREEZING IN FLORIDA, ESPECIALLY SOUTHWEST FLORIDA.

As there has been much discussion in regard to Florida winters, not only in regard to frost, but as to whether any part of the State is absolutely "frostless," I am sure the letter below, from such *excellent authority*, will be read and studied by many people. In the Reasoner catalog (see A. I. R. special notices in March issue) occurs the following: "All parts of Florida are subject to frost in a greater or less degree —there is no such thing as a "frost-line."

Dear Mr. Root:—In reading January GLEANINGS last night I see you (page 48) have made a serious error in notes on cold weather (Dec. 9th writing),

and so I am giving you herewith the list of *main* cold spells of the past 24 years:

Dec. 27, 1894, coldest ever known here, 18½ degrees; Feb. 8, 1895, (six weeks later, making a *double freeze*), 20 degrees; Feb. 14, 1899, 20 degrees; Nov. 28, 1903, 26 degrees; Jan. 26, 1905, 21 degrees; Dec. 1, 1909, 23 degrees; Dec. 4, 1910, 28 degrees.

Here follows six years of *unprecedented* freedom from cold, the longest spell of open winters in memory of *oldest inhabitant, including myself!* Tropical growth unhurt and tropical trees reached great size. Feb. 4, 1917, 20½ degrees; Dec. 10, 1917, 28 degrees; Jan. 4, 1918, 26 degrees.

Bradentown temperatures were 1 to 2 degrees warmer. Oneco is far from water protection, you know.

No serious December freeze in 1917, Dec. 10 only 28 degrees here.

Yours truly,
E. N. REASONER.

Oneco, Fla., Jan. 3, 1919.

In regard to the above, I happened to be in Florida during the *awful freeze* first mentioned. I got so tired of seeing frozen oranges, I pushed on down until I came to Bradentown. Here for the first time I found the fruit unharmed, and I happened to visit the Royal Palm nurseries when they were working night and day to get steam pipes installed to save the valuable plants. On Dec. 9, 1917, I found ice on the pans of water for the poultry, and when I wrote as I did I thought it was at *that time*, that the neighbors and "the oldest inhabitant" said it was "the coldest spell in 25 years." Friend Reasoner's letter illustrates how we forget.

On receipt of the letter I wrote as follows:

"I would be exceedingly glad if you could give us something about protection from frost. We have just tried throwing a furrow of soil over some potatoes, and it did harm rather than good. A covering of burlap sacks, to hold the frost up off the plants, has done most good for us. A wooden box is O. K., but tin pails or pans "no good." Newspapers are good, but a little soil must be put on the corners to prevent being blown away. A. I. Root."

Below is his reply:

Regarding cold last winter; the first light freeze Dec. 10th, temperature 28 degrees for a short time, would have made ice if water was shallow in open air without any cover or protection.

The Jan. 4th freeze, temperature 26 degrees, made much more ice.

In protecting plants it is necessary to provide a slight air vent at the *top* of any covering, whether paper, cloth or other material, so that air circulation is possible; otherwise the plants inside will freeze if the weather is at all cold. The more severe the freeze, the more absolutely necessary becomes the air vent. We prefer to bank trees or any perennial plants with soil, then stand branches of pine or anything with the foliage on, around the plant or tree, and tie or wire it steady; we stick the branches down in the ground, using a crowbar or piece of pipe to make the holes.

The pine is best because the needles stay on all

winter and thus form a permanent cover for several weeks, and they are open enough so the warmth of the ground can rise.

We never use paper or burlap except over plants for a slight protection.

EGBERT N. REASONER.
Oneco, Fla., Jan. 11.

Today, Feb. 5, nothing has been harmed this winter, except perhaps a few lima beans and some very tender plants. Gardens nearer the water not harmed at all.

THE VOLUNTEER PLANTS OF THE SOY BEAN.

I mentioned in our journal about the work that my good friend Jacob McQueen, Baltic, Ohio, had done in the way of developing nitrogen bacteria for legumes. Among other things I asked him if plants



The soy-bean plant showing nitrogen-gathering nodules on the right.

grown on the same ground the next season would show the nitrogen nodules without any further introduction of bacteria. He said it would last for years. Now, a year ago last summer we had some very fine soy beans growing in a particular part of our garden. Last spring quite a few volunteer shoots appeared, and they were allowed to grow. When fair time came I pulled up

several and carried them over to the fair. The picture on preceding page gives you a single specimen.

As the above plant grew in our hard stiff clay soil, probably a great many of the nodules were torn off as I pulled it up. Those remaining, as shown above, indicate what they look like. Some of them have nodules the size of beans.

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COW'S BUTTER COMPARED WITH "BUTTER"
FROM OTHER SOURCES.

We clip the following from the *Rural New Yorker*, omitting the picture of the two rats:

LIFE IN BUTTER FAT.

The chemists at the Wisconsin Experiment Station are doing some fine work in butter investigations. They have found that milk and its products contain a principle which is absolutely needed to promote growth in animals. This principle is found in alfalfa hay and other plants, but is not found in grains or most vegetable oils. Some remarkable experiments have been worked out in the demonstrations. Fig. 152 shows two rats. Both were fed on "balanced rations" which contained sufficient protein and mineral matter. The larger rat was given butter fat, while the smaller one received cottonseed oil. This one failed to grow, while we see by comparison what happened to his butter-fed companion. Among other things indicated by these remarkable discoveries is the fact that pure butter has a food value in excess of its actual chemical analysis. Oleo and other substitutes cannot compare with butter as a necessary and healthful food—especially for young people where growth is required.

I find quite a number of people, even here in the North, who use butter said to be made from coconuts, or perhaps other nuts as well as peanuts and cottonseed oil; and they, perhaps like myself, have not noticed very much difference in regard to the amount of *nutrition*; but if the *Rural* is right about it we had better pay the extra price and use the real butter. When the price gets away up during these war times, we can each and all get along with a little less.

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THE TOBACCO HABIT; BY ONE WHO KNOWS
WHAT HE IS TALKING ABOUT.

I want to tell you, Mr. Root, that when you made that proposition of a smoker for all who would quit smoking and chewing, I said to myself, "I am going to earn that smoker, and if I ever need it I will send for it." I have earned that smoker, but do not need it yet, as I have three good ones. It was the hardest fight of my life, but I won. I never prayed so hard to God to help me in anything in my life as I did for him to remove that desire I had for the poisonous weed.

Yours very truly,

Clear Lake, Wash. CHAS. W. HOPKINGER.

In view of the above, dear friends, would it not be well to consider the old maxim, "Prevention is better than cure"? Why should any boy or young man of the present age, with the above before his eyes, voluntarily *commence* the use of tobacco?

GEORGE MANIKOWSKE, THE INVENTOR OF THE
ELECTRIC WINDMILL.

I have had considerable to say about this particular friend of mine already; but I think it will be an inspiration to the rising generation of growing boys and young men for me to say a little more, and also to give you a picture of him as below.



My friend George, with an electric dynamo or motor under his arm, preparatory to climbing the windmill tower and belting it to the windwheel.

The particular reason, why I want you to have a good look at my friend George right while he is rushing his work, is because he is a splendid illustration of a young man who has grown up to manhood out under the influence of the blue skies and free air of North Dakota, and especially because he is a type of a young man who neither drinks, swears, nor uses tobacco in any form, and, as a rule, not even tea or coffee. Altho he weighs over 200 pounds he will go up a windmill tower almost as spry as a cat; and his brain and intellect are in keeping with his well-developed body.

North Dakota, you will remember, was one of the first States to demonstrate what prohibition does for a people. As I write, our own State of Ohio is rejoicing that finally, after a long-drawn-out war against intemperance, we too are going to start out growing such specimens of clean young men—clean in *mind* and clean in *body*—as the one in the picture I have given you.

Classified Advertisements

Notices will be inserted in these classified columns for 25 cents per line. Advertisements intended for this department cannot be less than two lines, and you must say you want your advertisement in the classified column or we will not be responsible for errors.

HONEY AND WAX FOR SALE

Beeswax bought and sold. Strohmeier & Arpe Co., 139 Franklin St., New York.

Buckwheat honey in 120-lb. cases, at 17c per pound. C. B. Howard, Geneva, N. Y.

FOR SALE.—Clover, amber and buckwheat honey in 60-lb. cans. C. J. Baldrige, Kendaia, N. Y.

FOR SALE.—Clover-amber honey in new 60-lb. cans. VanWyngarden Bros., Hebron, Ind.

FOR SALE.—Extra good quality sweet-clover honey, packed in new cans. Thos. Atkinson, Cozad, Nebr.

FOR SALE.—1,900 lbs. best extracted honey to settle estate. Make me a bid. Claude Colton, Administrator, Oswegatchie, N. Y.

FOR SALE.—4,000 lbs. of choice amber extracted honey in 10-lb. pails, 6 in case. John R. Brown, 115 Rust St., Eau Claire, Wis.

FOR SALE.—Thirty-two 60-lb. cans choice buckwheat extracted honey at 16c per pound. A. C. Beach, North Rose, N. Y.

FOR SALE.—Extra-good quality clover or white aster honey, packed in 60-lb. tins, two in a case. H. C. Lee, Brooksville, Ky.

FOR SALE.—Choice buckwheat extracted honey fully ripened by the bees, in new 60-lb. cans. O. W. Bedell, Earlville, N. Y.

FOR SALE.—Clover and buckwheat honey in any style containers (glass or tin). Let us quote you. The Dero Taylor Co., Newark, N. Y.

FOR SALE.—Clover-amber blend honey in 60-lb. cans, at 24½c; special price on large lots. Edw. A. Winkler, Joliet, R. F. D. No. 1, Ills.

FOR SALE.—Michigan's Best extracted honey in packages to suit; white clover, raspberry, milkweed, buckwheat. A. G. Woodman Co., Grand Rapids, Mich.

FOR SALE.—40,000 lbs. carload choice clover extracted honey. Was all left on the hives until after honey flow was over. Put up in new 60-lb. cans. J. N. Harris, St. Louis, Mich.

FOR SALE.—Best quality of sweet-clover honey in 5-gallon cans and barrels. Name highest price you can pay delivered at your address, quality guaranteed. M. C. Berry & Co., Hayneville, Ala.

FOR SALE.—40,000 lbs. of No. 1 extracted clover honey and 35,000 lbs. of aster honey, both of extra-light color, heavy body, and fine flavor, in 60-lb. cans. W. B. Wallin, Brooksville, Ky.

FOR SALE.—Clover, heartsease, No. 1 white comb, \$6.00 per case; fancy, \$6.50; extra fancy, \$7.00, 24 Danz. sections to case; extracted 120-lb. cases, 25c per pound. W. A. Latshaw Co., Carlisle, Ind.

HONEY AND WAX WANTED

Small lots of off-grade honey for baking purposes. C. W. Finch, 1451 Ogden Ave., Chicago, Ill.

WANTED.—Section honey. Correspondence solicited. J. E. Harris, Morristown, Tenn.

Beeswax wanted. Highest prices paid. State quantity and quality. E. S. Robinson, Mayville, N. Y.

WANTED.—Comb and extracted honey, also beeswax. Send samples. C. S. Fryer, 386 Halsey St., Portland, Ore.

BEEWAX WANTED.—For manufacture into SUPERIOR FOUNDATION. (Weed Process.) Superior Honey Co., Ogden, Utah.

WANTED.—Extracted honey, all kinds and grades for export purposes. Any quantity. Please send samples and quotations. M. Betancourt, 59 Pearl St., New York City.

WANTED.—White or light amber extracted honey in any quantity. Kindly send sample, tell how your honey is packed and your lowest cash price; also buy beeswax. E. B. Rosa, Monroe, Wisconsin.

WANTED.—Extracted honey in both light and amber grades. Kindly send sample, tell how honey is put up and quote lowest cash price delivered in Preston. M. V. Facey, Preston, Minn.

WANTED.—Extracted and comb honey. Carload or less quantities. Send particulars by mail and samples of extracted. Hoffman & Hauck, Inc., Richmond Hill, N. Y.

BEEWAX WANTED.—We are paying higher prices than usual for beeswax. Drop us a line and get our prices, either delivered at our station or your station as you choose. State how much you have and quality. Dadant & Sons, Hamilton, Illinois.

FOR SALE

HONEY LABELS.—Most attractive designs. Catalog free. Eastern Label Co., Clintonville, Conn.

FOR SALE.—A full line of Root's goods at Root's prices. A. L. Healy, Mayaguez, Porto Rico.

FOR SALE.—Good second-hand cans, 60c per case. C. S. Watts, Monticello, Ills.

FOR SALE.—Supers with section-holders. Different sizes. August Nigabower, Iion, N. Y.

FOR SALE.—Comb-honey supers, 10-frame bee-way, complete with sections and one-inch starters, 60c each. Used one season. L. W. Mundhenke, East Dubuque, Ills.

FOR SALE.—Six 10-frame Buckeye double-walled hives with supers for 4x5x1½ plain sections. First class condition. A bargain. John I. Nelson, New Market, N. J.

FOR SALE.—Second-hand 60-lb. cans, two to the case, 50c per case f. o. b. New York. Also second-hand maple-syrup cans at 10c each. Hoffman & Hauck, Inc., Richmond Hill, N. Y.

FOR SALE.—Comb foundation at prices that will save you money. Wax worked for cash or on shares. Send for price list. E. S. Robinson, Mayville, N. Y.

FOR SALE.—Good second-hand 60-lb. cans, two to the case, at 60c per case f. o. b. Cincinnati. Terms, cash with order. C. H. W. Weber & Co., 2146 Central Ave., Cincinnati, Ohio.

FOR SALE.—If you wish to know where to save money on bee supplies send for our new price list. It may be worth your trying. H. S. Duby & Son, St. Anne, Ills.

CANADIAN BEE SUPPLY & HONEY CO., Ltd.—73 Jarvis St., Toronto, Ont. (Note new address.) Full line of Root's famous goods; also made-in-Canada goods. Extractors and engines; GLEANINGS and all kinds of bee literature. Get the best. Catalog free.

The Best from Others.—Continued from page 246.

past season; and there are still about 80 more colonies of the same strain in the model apiary at the West of Scotland Agricultural College, Glasgow, says A. G. Pugh in the British Bee Journal for Feb. 20. The scheme of restocking with disease-resisting bees is at present being taken up in many parts of England.

HONEY SHIPPERS FINED.

An attempt to ship 100 tons of honey overseas without conforming to the regulations limiting space to certain produce, says the Australasian Beekeeper, resulted in the conviction, fine, and costs of the two shippers, as well as the forfeiture of the honey, valued at £7,000.

MARKET CONDITIONS

“We would not advise the shipment of any more old-crop honey at this time. Hold it off the market. Telegraphic reports show the weakness of the present market and the danger of forcing it down by overloading at this stage. If you have unsold honey, keep it until new prices are made.”—February Beekeepers' Item.

DEMUTH'S START IN BEEKEEPING.

George S. Demuth's beginning in beekeeping is briefly mentioned in the American Bee Journal for March. There we find he began beekeeping at the age of 14 years, and that he paid for his first colony by making fires and cleaning the schoolhouse at five cents a day, it requiring 110 days to raise enough money to purchase the first colony.

PACKAGE BEES BY THE TON.

Two large purchases of package bees is mentioned in the February Western Honey-bee—one for a ton of bees and queens as needed to be used somewhere in California, and the other for about four tons, and queens in proportion, these to be shipped out of the State. When the price on a single order for bees runs into five figures it is time to sit up and take notice.

BEE - SUPPLIES

FALCON LINE

We carry the largest supply in our section. Send us your inquiries.

Lowest Prices, Quality Considered

C. C. Clemons Bee Supply Co. 128 Grand Ave. KANSAS CITY, MO.

PATENTS Practice in Patent Office and Courts Patent Counsel of The A. I. Root Co. Chas. J. Williamson, McLachlan Building, WASHINGTON, D. C.

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TODAY OF WATERLOO For new 1919 Book. Save \$25 to \$200 on Gasoline Engines, Manure Spreaders, Cream Separators and other Implements. Sold direct from factory. Our 300,000 satisfied customers prove merit of goods and direct selling system. Close shipping points. Mention implement interested in. Write today. Wm. Galloway Co., Box 767 Waterloo, Iowa

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Buy direct and save \$10 to \$20 on a bicycle. RANGER BICYCLES now come in 44 styles, colors and sizes. Greatly improved; prices reduced. Other reliable models also. WE DELIVER FREE to you on approval and 30 days trial and riding test. Our big FREE catalog shows everything new in bicycles and sundries. Write for it. TIRES, lamps, wheels, parts and supplies at half usual prices. Do not buy a bicycle, tires, or sundries until you get our wonderful new offers, low prices and liberal terms. A postal brings everything. MEAD CYCLE COMPANY Dept. B-153 Chicago

IRON AGE GARDEN TOOLS

Answer the farmer's big questions: How can I have a good garden with least expense? How can the wife have plenty of fresh vegetables for the home table with least labor? This Hill or Drill Seeder and Wheel Hoe Combined solves the garden labor problem. Takes the place of many tools—stored in small space. Sows, covers, cultivates, weeds, ridges, etc., better than old-time tools. A woman, boy or girl can push it and do a day's hand-work in 60 minutes. Many combinations and prices. Write for free booklet today. Bateman Mfg Co., Box 20C, Grenloch, N. J.

BEEKEEPERS

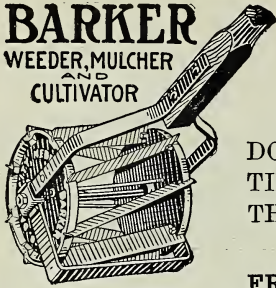
Do not wait until the last minute to order your supplies. Order now.

We carry a complete line of beekeepers' supplies. Send us a list of your requirements for this season and we will quote you our lowest prices.

Send for our 1919 Catalog.

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BARKER
WEEDER, MULCHER
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Weeds and Mulches In One Operation

DOES BETTER WORK THAN A HOE—TEN TIMES AS FAST—SAVES TIME AND LABOR, THE TWO BIG EXPENSE ITEMS—EASY TO OPERATE.

FREE—Illustrated Book and Factory-to-User Offer

We want every garden grower to know just how this marvelous machine will make his work easier and increase his profits. So we have prepared a book showing photographs of it at work and fully describing its principle. Explains how steel blades, revolving against a stationary knife (like a lawn mower) destroy the weeds and at the same time break up the crust and clods and pulverize the surface into a level, moisture-retaining mulch.

“Best Weed Killer Ever Used”

LEAF GUARDS—The Barker gets close to the plants. Cuts runners. Has leaf guards; also easily attached shovels for deeper cultivation—*making three garden tools in one.* A boy can use it. Five sizes. Send today for book, free and postpaid.

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Gentlemen.— Send me postpaid your free book and Factory-to-User Offer.

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State _____

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IF GOODS ARE WANTED QUICKLY

SEND TO ST. LOUIS

Indications just now are very favorable for a good season; but we are, of course, at the mercy of weather conditions. A good season means an excessive demand for the line which we handle, and we mention this, urging our friends to place their orders before the goods are really needed, that none may be disappointed.

WE CARRY ROOT'S GOODS

and sell at their prices; and considering this as a shipping-point, we can save you time and freight by having your orders come to this house. If you are new to the business we should like to explain that Root's goods are the very best that can be produced. If you have been using THE ROOT LINE you will recognize the truthfulness of the above and will want more of the same goods. Promptness in filling orders is the motto here. We also give small orders the same careful attention that is given to large orders. Let us have the pleasure of mailing you our free catalog.

BLANKE SUPPLY & MFG. COMPANY

ST. LOUIS, MO.

BOOKS AND BULLETINS

"Practical Queen-rearing" is the title of a new book of 100 pages on queen-rearing, by Frank C. Pellett of the American Bee Journal. Mr. Pellett has traveled quite extensively over the United States, and has interviewed some of the most extensive queen-breeders of the country. He has given all their different methods with copious illustrations. Besides taking up queen-rearing in particular, he discusses races of bees, the story of the queen and drone, and improvement of stock. Then he takes up equipment for queen-rearing, methods of the different breeders, closing up with a discussion of the very important subject, the spread of disease from the queen-rearing yard. The editor has gone over his work, and, so far as he can see, it is orthodox and correct in teaching. He could not help noting the absolute omission of E. L. Pratt and his methods of raising queens—a man known in former days as "Swarthmore." Next to Doolittle, Mr. Pratt did, perhaps, as much to develop modern queen-rearing methods as any other man in the United States. We are assured by Mr. Pellett that the omission of Mr. Pratt's name, whose methods, in modified form, are seen all thru the book, was unintentional and an oversight.

"Town Lot Poultry Keeping"

Revised and Enlarged—70 Illustrations.

One of the best and most complete books published for the beginner, small breeder or commercial poultry man. Price only 50 cents. Flexible Cover \$1.00. With Poultry Item, the big monthly guide for the poultryman, \$1.00. Item, 1 yr. 75c. —4 mos. 25c. Experience not necessary if you have this book and the Item.

POULTRY ITEM, Box 70, Sellersville, Pa.

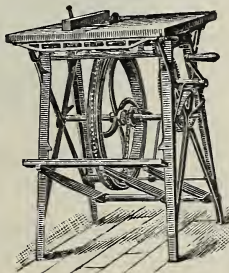
BARNES' Hand and Foot Power Machinery

This cut represents our combined circular saw, which is made for beekeepers' use in the construction of their hives, sections, etc.

Machines on Trial

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GOOD SEEDS



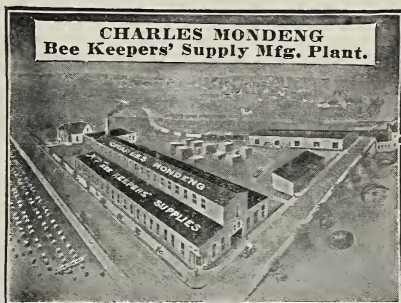
**GOOD AS CAN BE GROWN
Prices Below All Others**

I will give a lot of new sorts free with every order I fill. Buy and test. Return if not O. K.—money refunded.

Big Catalog FREE

Over 700 illustrations of vegetables and flowers. Send yours and your neighbors' addresses.
R. H. SHUMWAY, Rockford, Ill.

\$30.000 WORTH OF Bee Supplies



**CHARLES MONDENG
Bee Keepers' Supply Mfg. Plant.**

All boxed ready to ship at once; 275,000 Hoffman frames, also Jumbo and Shallow frames, of all kinds, 100 and 200 in a box. Big stock of Sections, and fine polished Dovetailed Hives and Supers. I can give you big bargains. Send for a new price list. I can save you money.

*Will Take Beeswax in Trade at
Highest Market Price.*

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DISTANCE is no hindrance to saving money
BY MAIL with this large safe bank, at 4
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No matter where you live, send today for a
copy of our interesting booklet "Banking by
Mail."

THE SAVINGS DEPOSIT BANK CO.

A.T. SPITZER, Pres.
E.R. ROOT, Vice Pres. E.B. SPITZER, Cash.

MEDINA, OHIO

AROUND THE OFFICE

M.-A.-O.

I was squeeze out of the last Gleanings because I ain't good enough when there aint room for everybody. The highbrows and hifalutins have to have their say whether I do or not. I aint a sayin I care at all, only I hate to have these high snorters a trompin on me any time whatsoever when I don't believe half they say and most of em talkin thru their bee veils. They orter use a smoker on themselves oftener than they do. But seein as how a big advertisement didn't come in the last minute the Miss Assistant Editor calls out to me when passin her writin and disputin den as how I better fill a little space over among the advertisements. I aint proud as I orter be or I'd a told her what she and the mismanagin editor could both do and keep on doin, so I would. But I says, didn't I write up my last biggest trouble for you last month and you didn't print it. And she says go and get it and put it in as it was. So I done it and here it is more'n three quarters true too which is a big average on truth in beekeepin writin. I then about the first of March wrote as follows towit:

I am in trouble oncet again. In fact, I aint out o trouble much any time. It's just one thing after another as that happens to me continously and right along. If it aint one thing, then it's another thing worse'n the thing afore. It's about all I can stan to have any winter come on and freeze up the fishin complete, but when that last dog-goned cold spell come on last month and froze up my well pump solid, and I broke the chain tryin to get it to resoom I lost my temper some. Before I got control again, it was discovered I had chopped up that pump with a ax to get even. I guess I was het up a good deal and turned on some real language. Anyway, it all led to a good deal of discussion between me and my poor, long-suf-

ferin wife as to whether I had done thin very smart or not and if I thought had hurt the low temperature ver considerable by knockin the useful o pump to smithereens. This would'n have been so much out of the ordinari if somethin else hadn't a happene



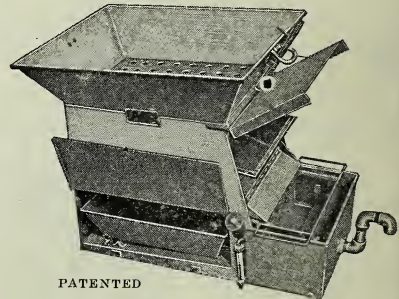
"Help Wanted."

right onto the top of i Accordin to usual pr gram, my conjoogal ot er half went just a-sai in across the road ov to my mother-in-law to tell her all about m pump action—not omi tin any details, you be Well, my mother-in-la hadn't any more'n fail ly got started in on m general disposishun ar solushun of frozen pump troubles than he favorite old pussy cat, somewhere out by the chicken house, let out the allfiredest comb

(Continued on next page)

THE SEVERIN

Melter and Separator COMBINED



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Your Duty—Do You Know It?

It is to get ready for the coming season and be ready for the first honey flow. This will net you profits. Prepare your bees for a big year and take no chances. Get the best to do with and have the best results.

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We get the beekeepers ready for the big season. Supply them with the best of everything with which to work and get the best results. Send us a list of your requirements for quotation. **TO DELAY MEANS LOSS TO YOU.** "Falcon" service cannot be beat. Catalog and Simplified Beekeeping on request.

W. T. Falconer Manufacturing Company

Falconer, New York

"where the best bee hives come from"

"Falcon"

tion scream and howl of terrification and al pain you ever heard. That cat was in earnest, she was, and she wanted help, he did. I heard her away over at my happy home and above all the roar of my ten surgin thoughts. About one and two-thirds seconds later I saw my mother-in-law and her daughter that is related to me by marriage boil out of the back door and set all jest awhoopin in the general direction of old kitty's continooin call for aid and sympathy. I suspected in just a hully jiffy what was up. A skunk had been inhabitin under my wife's mother's chicken house all winter, and the night afore I had set a trap there. My mother-in-law said all along she just knew I'd catch her cat if I set a trap there, and she prohibited it complete. She said I needn't try to make her believe my bees was in danger from skunks. So I had set unbeknownst to her. Accordinly, I in- antaneously right away then felt certain that the old cat had found out what I had done and was tell-

mother-in-law about it. So I left home and came over to the office right to oncet. That was in the mornin early, and I didn't find ocshun to go home anythin that day till everybody was in bed. Benny Peters dropped to the shop dur- that afternoon and told me the old cat was hurt methin awful



"Jest awhoopin."

and limpin terrible and my people was the saddest he ever seen 'em. That meant I had to do somethin right to oncet. For the omise of one of my best fish lines and a skel down, Benny went and got Del Giddin's

(Continued on next page.)

450,000 TREES

200 varieties. Also Grapes, Small Fruits, etc. Best rooted stock. Genuine, cheap. 3 sample blackberries mailed for 10c. Catalog free. LEWIS ROESCH, Box H Fredonia, N.Y.

NO CASH REQUIRED WITH ORDER



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"Best" Hand Lantern



A powerful portable lamp, giving a 300 candle power pure white light. Just what the farmer, dairyman, stockman, etc. needs. Safe—Reliable—Economical—Absolutely Rain, Storm and Bug proof. Burns either gasoline or kerosene. Light in weight. Agents wanted. Big Profits. Write for Catalog. **THE BEST LIGHT CO.**
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Answer the farmers' big questions, How can I grow crops with less expense? How can I save in planting potatoes? How make high priced seed go farthest? The **IRON AGE Potato Planter** solves the labor problem and makes the best use of high priced seed. Means \$5 to \$50 extra profit per acre. Every seed piece in its place and only one. Saves 1 to 2 bushels seed per acre. Uniform depth; even spacing. We make a full line of potato machinery. Send for booklet today.

**No Misses
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QUEENS - ITALIAN - QUEENS

BRED IN ONTARIO FROM DOOLITTLE STOCK



| 1919 | PRICE LIST | | | 1919 |
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| Begin Delivery June 15 | 1 | 6 | 12 | 50 |
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| Select Untested | 1.25 | 7.00 | 13.00 | 50.00 |

Send us list of your requirements early so as to insure date of delivery. We are booking orders now, 25% down. We clip queen's wings free of charge on request.

RUMFORD & FRETZ :- :- **FOREST, ONTARIO**

boy to say he set the trap. I got out of it that way (or, rather, am out of it up to yet) only I feel suspicion keeps pointin my way about it. They can't prove nothin, but they keep a generally cool atmosphere around me yet and keep pityin the cat specially strong when I am present in persono. They also keep denyin verbally too that they agree with me as to fixin froze-up pumps, always luggin in somethin about "that mornin poor old kitty got into somebody's trap"—always lookin hard at me just as they bear down specially on that word "somebody's." So I say, I am in trouble again, and I aint likely to be free of it complete till Del Giddin's boy has established hisself in my mind as bein entirely dependable and the kind as hangs by the binder. I know he's under pressure. I keep wonderin about him and his dependability a lot.

P. S. and Later.—Since the above was wrote every thin has gone by the board. Giddin's boy let go his agreement and caflummuxed me complete. I aint got no standin with nobody to speak of no more around my domicile, and the old cat at motherinlaw's aint no better as to lameness.

There ain't no particklar moral to these recurrin incidentises, except a former one, that it don't pay to get mad and make a everlastin fool of yourself, and a additional one that if you get somebody to lie for you in gettin out of trouble you don't get out much and you keep on worryin a good deal longer.

GIANT FRENCH BEANS

(Lincoln's French Asparagus Bean)

THIRTY inches long. A remarkable vegetable that bears GIGANTIC stringless pods longer than a man's arm, and of delicious, rare, flavor. Not a novelty, but a Century old Oriental delicacy. Produces abundantly anywhere with 90 days growing weather. A valuable companion crop for Beekeepers. Free Bulletin describing this and other superfine seed strains if you mention "Gleanings."

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Answer the "war gardener's" big question: How can I produce the most food in spare moments? How meet increased costs and war taxes?

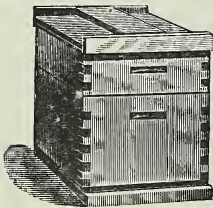
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32 years' experience in making everything for the beekeeper. A large factory specially equipped for the purpose ensures goods of highest quality. Write for our illustrated catalog and discounts today.

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QUEENS THAT WILL PLEASE QUEENS THAT ARE BRED FOR BUSINESS

They are hardy, long-lived, gentle, and disease-resisting. They are as good as any and far superior to most—bred from imported stock, which produces a bee that is the best in the world for honey-gathering, and are non-swarmers. They are now giving service in nearly every country in the world. Have your order booked now. All that we require is one-fourth cash and balance at shipping time. We guarantee every queen to reach you in first-class condition, to be purely mated, and to give perfect satisfaction, in the U. S. and Canada.

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| Select Untested | 1.50 | 7.50 | 13.25 | Selected Tested | 4.00 | 22.00 | 41.00 |

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