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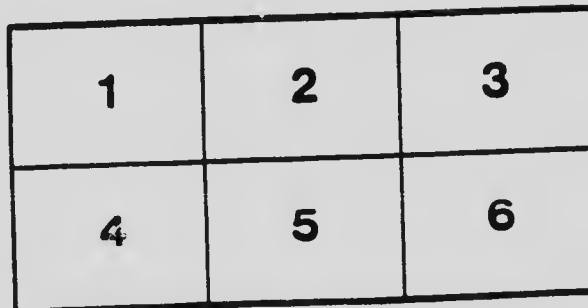
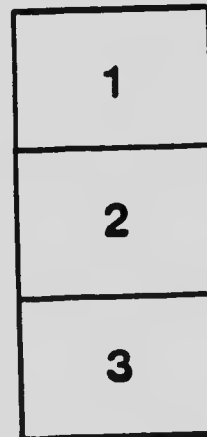
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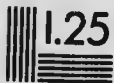
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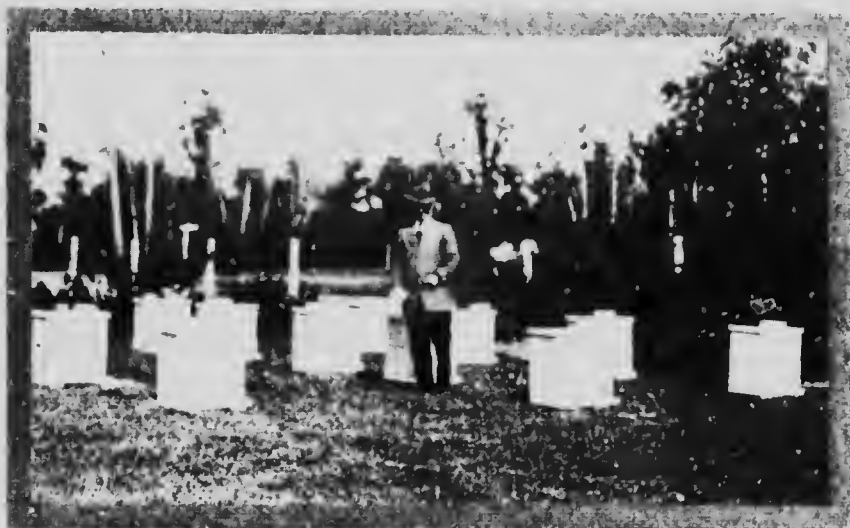
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Beekeeping in Manitoba

By R. M. MUCKLE, B.S.A.

Extension Specialist, Beekeeping, Manitoba Department of Agriculture



Apiary at M.A.C., where demonstrations of Bee Culture are being conducted.

Manitoba Agricultural College

WINNIPEG, CANADA

Published by the authority of Hon. Valentine Winkler, Minister of Agriculture and Immigration

30-4
278

Manitoba Agricultural College,
Winnipeg, Canada,
July, 1915.

To the HON. VALENTINE WINKLER,
Minister of Agriculture and Immigration,
Winnipeg, Manitoba.

Sir—I beg to present herewith Bulletin No. 18 of the Manitoba Agricultural College, entitled "Beekeeping in Manitoba," by R. M. Muckle, B.S.A., Inspector of Foul Brood and General Apiarist for the Province.

The interest in Beekeeping is steadily increasing in Manitoba and many enquiries are being received. This publication is of interest to the farmers, I feel sure.

very truly,

W. J. BLACK,

President.

BEEKEEPING IN MANITOBA

TO be a successful beekeeper one must have a fair understanding of the domestic life within the hive and must understand how bees are reared, how the comb is built, honey stored, etc. A knowledge of these things enables the beekeeper to understand what operations may be performed without disturbing the domestic economy of the colony. Nature has endowed the bees with certain definite instincts. Man cannot change these instincts, but he can work in accord with them, and the bees thus aided by their master's intelligence can accomplish far more than they could without it.

HONEY AS A FOOD

Honey is a wholesome food and one that is not without medicinal value. Dr. C. C. Miller says: "It is only within the last generation that refined sugars have become so low in price that they may be commonly used. Formerly honey was the principal sweet and it would be greatly to the health of the present generation if honey could be restored, partially at least, to its former place."

We all know that children long for candy. This longing voices a need and is an evidence of the necessity of sugar in our diet. There can be no doubt but that in eating honey our digestive machinery is saved work; because cane sugar must first be changed to sugar similar to honey before it can be used by the body.

The importance of bees in fertilizing the blossoms of fruit trees and other plants (such as clovers, alfalfa, cucumbers, strawberries, etc.) should not be lost sight of.

MODERN METHODS

Most of the unpleasant features of beekeeping have been eliminated by the perfection of methods of handling bees. Still more has been done by perfecting the bees themselves. If one secures a gentle strain of Italians he can, with only a few hives, go practically a whole season without a sting; and there is not a particle of danger if he wears a good bee veil. With a good smoker to quiet the bees and with proper protection it is "Just fun to handle bees."

BEEES ON THE AVERAGE MANITOBA FARM

The West is essentially a land of hustle. "Wheat, Wheat, Wheat," has been our watchword. However, this is changing, as it has done in every other country under the sun. People are going in for mixed farming or the keeping of cattle, sheep, hogs, etc. This does not mean that we will grow less wheat but that while wheat will have its place on the farm, so will cattle, sheep, hogs, etc. Why not bees?

Two questions arise. Does a farmer have time to look after a few colonies of bees? Will it pay to keep bees on the average farm in the West?

There is nothing on the farm that requires so little care in proportion to the returns as the bees. This is why they are often kept with rather small returns—because the care they need is so small that it is often utterly neglected.

They require only a little attention, but what they do require they must have promptly. It must be understood that the profits are as great as from any other part of the farm provided the same care proportionately is exercised in looking after the bees as is usually given to other stock or to the garden. There are but few people who do not like honey, its production in sufficient quantities for family use is neither difficult nor expensive. Even if one does not



Worker



Drone



Queen

consider the sale of any surplus, he will find himself well repaid for investment in a few colonies by the pleasure and satisfaction of having pure and wholesome honey for his own table.

CONDITIONS IN THE HIVE

To be a successful beekeeper, one must have a fair understanding of the domestic life within the hive, and must know just what to do and when to do it.

The honey-bee belongs to an order of insects that, as a rule, congregate in large numbers as found in the hive or colony. Inside the hive will be found three distinct forms of adult bees—the queen, the drones and the workers.

THE QUEEN

Only one queen is normally found in each colony and her duty is to deposit eggs from which all bees are hatched. In appearance she is much longer than the worker and is also slightly thicker and broader. However, on account of her lengthened abdomen she appears much more slender and wasp-like than a worker.

A good queen during the height of the honey season will deposit as many as 1,000 to 3,000 eggs per day and usually she will continue active egg-laying for two, or even up to five years.



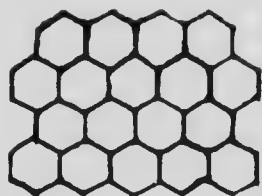
A Neglected Apiary—Honey Crop, 1915, NOTHING.

ORGANIZED LABOR

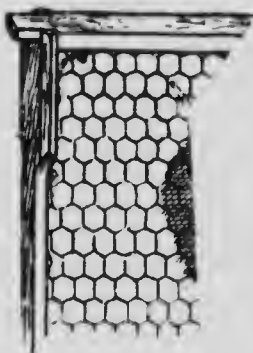
The workers are by far the most numerous individual of the colony, numbering in strong colonies as many as 50,000. They are the units of organized labor and to their lot fall all the duties of the hive except egg-laying and fertilization of the young queen. They build the comb, gather the honey, feed the young bees or larvae, and protect the community from robber bees or other enemies. Both the queen and the workers are provided with stings but the queen rarely makes use of hers.

THE DRONE

The drones are found more abundantly at certain seasons than others. They are plentiful at the approach of the swarming season in May or June. Big, clumsy, and very fat, they perform no part of the daily labor in the hive, for their sole function is to mate with the young queens which, under ordinary conditions, appear in the colony about once a year during the swarming season.



Drone Comb



BALANCE OF THE SEXES

It is interesting to note that of all animal life the bee is one of the few that has been able to solve the problem of the balance of the sexes, the queen being able to lay an egg that will hatch either a drone or worker, a male or female. It has been explained that the queen lays all the eggs and the drones are the male bees; what, then, are the workers?

PROBLEMS SOLVED

At some time in the history of bee-life and of society must have taught the bees to gather together for warmth during the winter season, and here we find a community that to all appearances has solved the problems that are now vexing our social philosopher. In the human world, the increase in population and increase in relation to food supply, the balance of the sexes, the problem of individual ownership of property, due qualification for parenthood and whether might is right all seem to have been happily settled by the bee commonwealth.

From the crowding together of the separate bee families for mutual protection against the elements to a complete and permanent fusion of life must have been only a step as nature works. But think of



Queen Cells in Different Stages

this colony with its hundreds of prolific mothers, each having enough to do at home in rearing her own children, and a crowd of lazy drones who could do nothing but play in the sun. How were the daily needs of the hive to be satisfied, leaving out of account the provisions that must be made for the coming winter?

Right here was a triumph of self-sacrifice. Motherhood was to be a privilege of the few and the rest work. In common or a lot of the classes. Hard times had already bred a lean, unattractive, and unprofitable, and it was discovered that fertile ratios in the nurseries meant a considerable increase in what we now call workers, which are simply immature queens.

THE WORKER-BEE

These workers differ from the queen in that their abdomen is comparatively short and rounded, that of queen being longer and longer and coming to a fairly sharp point. The worker-bee has a complicated system of wax-secreting discs or glands under the hard plates of her abdomen. On the hind legs the workers have a curious contrivance which beekeepers have named the pollen-baskets. It is a hollowing of the thigh, the cavity being surrounded with stiff hairs; and within this the pollen is packed and carried home to the hive to feed the young.

In the queen both the cavity and hairs are absent and also the wax-secreting glands. The color, too, of the queen is generally different from that of the worker-bee, her body and legs in most cases being a much redder brown.



Yield, 1913 Over 100 lbs. each.

DRONE-LAYING WORKERS AND QUEENS



An Ideal Spot for an Apiary.

The worker-bee is capable of producing her kind, yet only the male of the species. It sometimes happens that a hive will lose its queen, during the winter when there are no eggs in the hive, due to the fact that the old queen has outlived her usefulness. The following spring a worker will commence to lay industriously, only to add to the hive a crowd of useless males that will soon be the sole representatives of the doomed household.



Small budding is needed for storing equipment and supplies.

The virgin queen-bee is always able to reproduce herself, but, like the worker, only the male of the species, the drone, has the power to mate. No drones exist and her fertilization after emergence of the colony. The restriction of wing prevents her going out for a mate, and she is able to mate with the drones only when flying. She will collect food for herself and her brood of egg-laying and these eggs will hatch into queen-bees.

The worker and the queen are always properly fertilized. The worker, being fed famine rations in the nursery, does not develop wings and loses the power of being fertilized by the drone or male.

THE MOTHER BEE

The egg is three days in hatching, but the young larvae are at least three more days old before nature has made the irrevocable step along either of the divergent ways. If a hive loses its queen and it happens that all the eggs in the worker-cells are hatched out, the bees will breed another queen from one of the worker-larva available.

This is generally successful when the young queen has not passed the three-day limit. But even when all the larvae or grubs have passed the drifting line, the bees will still attempt to rear a queen, knowing well that without a queen the colony must perish. In this case, however, the resulting queen will be defective, and probably she will never be capable of fertilization and therefore the source of worker-bees will be cut off; and unless the beekeeper supplies the colony with a new queen, properly mated, the hive will gradually fill up with drones, the old worker-bees will die off and the hive must ultimately become extinct.

The queen, then, is the all-important mother-bee of the colony and no colony can long exist without a properly fertilized queen.

The queen is hatched from a fertilized egg in a



A Luxuriant Growth of White Sweet Clover near Selkirk

specially large cell rounded and about the shape of the end of a person's little finger from the last joint.

The cells designed to contain the worker brood measure one-fifth of an inch across the mouth; drone cells are larger, having a diameter of a quarter-inch as well as greater depth.

To be successful in the keeping of bees it is necessary to follow the three rules of beekeeping, which are: Keep the colonies strong; keep the colonies



Smoke Blowers for Beekeepers.

strong; keep the colonies strong. It is only from populous colonies that we can expect to get an abundant honey harvest.

To have strong and prosperous colonies we must have the right kind of a queen, and therefore the beekeeper must know how to tell a good queen from a poor one.

HOW TO TELL A GOOD QUEEN

A good queen will start laying in the middle of a comb and lay one egg in each cell in a circle, so that as the brood develops each comb will present an even appearance and be filled from top to bottom and right out to the ends with brood, not leaving a rim of honey just below the top bar.

The brood chamber should not be used for the storage of honey; we expect the brood combs to be filled with brood. We want a queen that will not lay in a drone comb early in the season, because too many of these lazy fellows eat up the profits. A good queen is known by the workers that hatch from her eggs. They should be industrious, gentle, and resistant to disease. The selection of breeders that are not inclined to swarm is wise. Some colonies swarm much less than others, and there is no doubt that the swarming instinct can be bred out to a certain extent by selecting queens from non-swarving colonies.



Bee Gloves with fingers.



Bee Mitts with fingers exposed.

The queen herself should be apparently well developed, graceful and strong in her movements, not excitable nor easily frightened, but neither awkward nor sluggish.

A queen bee is at her best in her second year, and should not be allowed to retain her position after she shows signs of waning energy. A very old queen will have lost her power to lay worker eggs and will have become nothing but a drone-breeder. But the bees are seldom caught napping in this way. Long before this happens the bees will have commenced the hatching of a young queen.



Honey Knife.

HOW LONG SHOULD WE KEEP QUEENS?

The writer does not believe it wise to keep a queen after she is three years old unless she is an exceptionally good one. Old queens often die during the winter and in the spring the beekeeper finds the colony queenless. This is the time of the year that young queens are most valuable.

Young queens, as a rule, lay eggs late in the fall and the bees hatched from these eggs live until the following spring, thus giving a strong force of workers to keep up the heat of the hive during the cool spring weather.

The approximate time taken for the development of the different individuals in the hive is as follows:

	Egg	Larva	Pupa Sealed	Total Time
Queen	3 days	5½ days	7 days	15½ days
Drone	3 days	6 days	15 days	24 days
Worker	3 days	5 days	13 days	21 days

LOCATION OF THE APIARY

In selecting a place for bee-keeping, two points arise. First whether the situation is good for hives; and whether the locality is good for bees. The hives should be well protected from north and west winds by a bluff of trees, a ledge, a hill, or a high-board fence.

AN IDEAL SPOT

An ideal spot would be one having a southeasterly slope where the hives could get the sunshine, especially in the early morning. The entrance of the hive should face in a southerly direction, the hive being set level from side to side and a trifle higher at the rear than it is in the front. This prevents water from running in the door of the hive and also makes it easier for the bees to clean out their hive.

In many parts of the West there are districts, now unoccupied by beekeepers, where apiaries could be kept with profit. White clover, dandelion, goldenrod, and many wild plants grow abundantly almost everywhere, while in certain sections these are found in such profusion as to furnish large surpluses of honey during favorable seasons.

It has been thought sometimes by persons not acquainted with the facts, that we are too far north and west for successful apiculture. However, this is not the case, as our honey crop per colony is equal to, if not larger than, that of the East; this is due to the longer period of daylight during the summer months, and to the fact that our bees gather honey from a large variety of plants which continue to bloom over a long period of time.

A good locality for beekeeping should have an average number of flowering plants, a certain amount of shelter for the hives and some place where the bees can obtain water.



Bee Brush



No. 1 Hive, 8 frame.



No. 1 Hive, 10 frame

HOW TO BEGIN

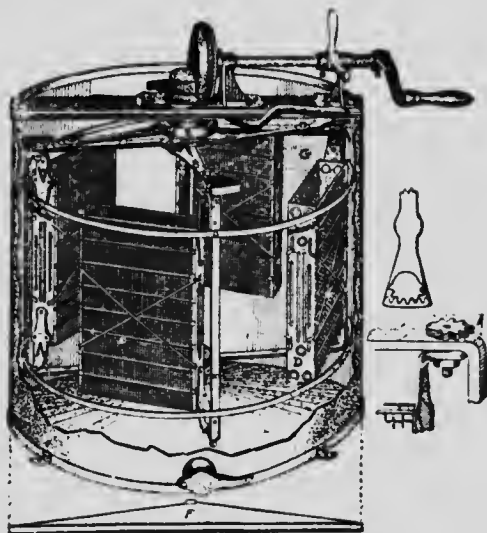
The best time of the year to begin beekeeping is during the early part of the summer, May or June. Small beginnings should be made with as little expense as possible. It is extremely discouraging, after having plunged into the business extensively, blindfolded as it were, to lose a large portion of the bees, through bad wintering or some other cause, all for the want of a little practical experience or even of theoretical knowledge.

Invest ten, fifteen or thirty dollars, then make the bees pay their own way. Buy in your own locality, if possible, as you thus do away with the danger of bringing bee disease into your neighborhood.

As the West is almost free from "Foul Brood" disease, beekeepers and those intending to become such should remember that prevention is vastly better than cure and costs a great deal less. Purchasers of bees should therefore be very careful where they place their orders, and should buy only on an absolute guarantee against loss from foul brood.

If you are a beginner, buy from a reliable man, as you will have to trust to him for the value received. If possible, it would be well to visit some progressive beekeeper and spend a whole day where you will be able to pick up tricks of the trade and a fund of other useful information.

The writer would advise the beginner to buy bees in his own locality, if possible, even if the initial price is a little higher than for imported stock. He can then improve his bees by buying laying queens from superior stock



Automatic Honey Extractor.

RACES OF BEES



Full Depth Extracting Super E.

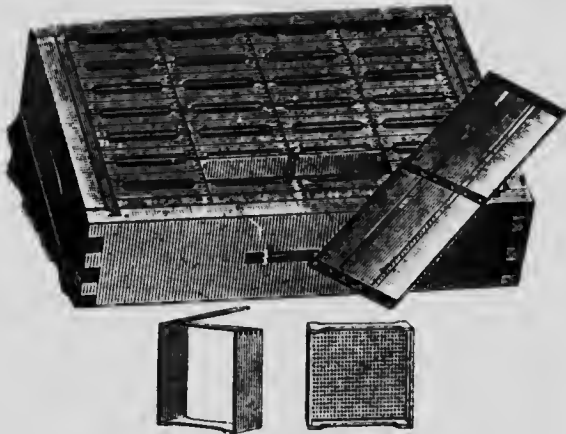
In Canada at the present time we have quite a number of different strains of bees, and the beginner is often at a loss to know which is the most suitable for his conditions. The three or five-banded Italian bee has proven more satisfactory than either the common "Blacks" or the Golden Italians. The three and five-banded Italians, as a rule, are easier to handle, show less tendency to swarm, and winter well.

EQUIPMENT

A large amount of equipment is not necessary to begin a small apiary. Some building is needed in which to store the apparatus and supplies.

The windows of this house should be screened to prevent the entrance of bees, and provision should be made at the top of the window, by means of a bee escape, for the escape of any bees that have been brought into the bee-house. This building may be fitted up with a work bench and racks for storing frames, etc.

The man that has only a few hives can keep his empty hives in a part of his granary and store his honey in the house. When storing honey do not leave it exposed to the air in a damp atmosphere, as it will take up moisture and perhaps spoil.



Comb Super A, with Split Top Sections and Slat Separator.

A bee-smoker, bee-veil, gloves, honey-knife, bee brush and a few empty hives are needed.

BEE-SMOKER

A good smoker is one of the essentials for the proper handling of bees. By means of a few puffs of smoke sent in underneath the cover of the frames the bees are pacified, as the smoke induces them to fill their selves with honey, and when in this condition they seldom sting.

BEE-VEIL

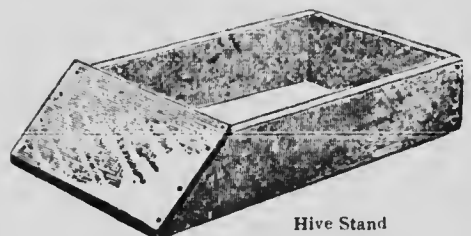
A bee-veil is necessary to a novice in that it creates confidence. A bee-veil should be light, durable, easy to see through, cool and efficient. The upper end is fastened around the hat by means of an elastic band, while the lower end can be tucked inside the coat.

BEE GLOVES

For those who are beginners, or others who may be seriously affected by the sting or poison of the bee, it is advisable to wear a pair of gloves. These gloves are handled by the different supply houses. The writer prefers the bee glove made with a long sleeve and of heavy drilling. (See illustration, Page 8) rather than the short rubber glove.

HONEY KNIFE

A knife is needed for uncapping the cells when extracting. One as shown on Page 8 is very satisfactory and will do better work if dipped in hot water. This dipping warms the knife and prevents the honey from sticking to the blade.



Hive Stand

BEE BRUSH

A bee brush is needed, one that is long enough to reach clear across an ordinary Langstroth frame, to brush the bees from the combs, as only by practise is the beekeeper able to shake a comb free from bees.

HIVES

There are a considerable number of different makes of hives on the market, some being more suitable for certain conditions than others.

THE LANGSTROTH HIVE

The Langstroth hive is the recognized standard throughout the American continent, and it is advisable for a beginner to adhere to this standard.

THE MODERN HIVE

The modern hive has eliminated crude and cruel methods formerly resorted to, and in their stead we have accessibility to every part, and can take their honey without destroying our little servants, and without a sting, if we are careful.

The hive in its simplest form consists of a floor or bottom-board, a hive body or box to hold the brood frames, and a lid or cover to shield the hive from the weather. In addition to this an entrance board or cleat should be used so that a wide or narrow entrance may be used, depending upon the season.

In the best-regulated apiaries hive-stands are used for holding the hives. These stands protect the hive bottom and hive from unnecessary exposure to the ground and consequent rot. It is important to have a hive stand sloping to the ground in front so as to provide an easy runway into the hive.

Besides the hive body or brood chamber either extracting or comb-honey supers may be used. The comb-honey or shallow extracting supers are only half the depth of the hive body. They can be used either for comb-honey or extracted honey.

THE SUPER MOST GENERALLY USED

The super most generally used is a regular full depth extracting super which is in every respect the same as the hive body. By use of supers one part can be piled on top of another in such a way as to accommodate the largest colonies and the largest yields of honey that may be secured. The modern hive, therefore, is capable of all degrees of expansion to accommodate any colony or any honey crop. Some large colonies will store enough honey to make a hive four or even five stories high.

The beekeeper should therefore keep on hand a sufficient number of supers to place on his hives so that the bees may have room at all times in which to store their honey. If the hive is too small the bees will stop work when it becomes filled, thus causing loss to the owner.



FRAMES AND FOUNDATION

The hive contains the frames on which the honey comb is built. The Hoffman self-spacing frames give the best satisfaction. By using self-spacing frames labor is very greatly economized, the frames can be handled in groups of two or more, and when set in the hive can be shoved together at one operation without the necessity of fingering over each frame to get it spaced exactly the same distance from others.

COMB HONEY SUPER

The production of honey in the comb involves a different set of fixtures. Comb-honey is produced in little square boxes called "sections." These sections are placed in a frame called a "section holder" and between each row of sections is placed a wooden fence or separator. The bees then build the comb out to within a short distance of this fence, thus making the sections uniform.

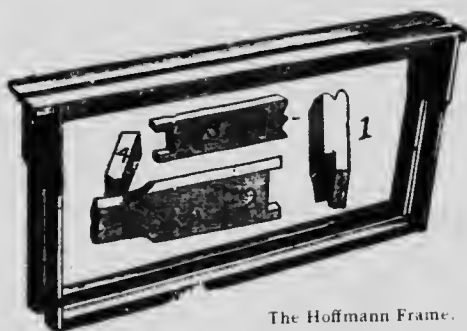


The Use of Comb Foundation.

COMB FOUNDATION

To start the bees building comb modern bee-keepers use a product known as comb foundation. This comb foundation is made by means of a "comb foundation machine" from sheets of pure beeswax and is an exact duplicate of the midrib or center of honey-comb, hence the name "foundation."

It is used in narrow strips, called "starters," or in full sheets. The latter are preferable because the bees will build more nearly perfect combs and at a lower cost. When bees are given full sheets of foundation they are not likely to build drone comb in the brood nest. When drone comb is built in the brood nest a lot of useless drones are hatched. They are voracious eaters, and as only one out of many



The Hoffman Frame.

can be used for stinging purposes, their production from an economic standpoint is an enormous waste. It is a good plan to have all frames wired, as this makes them much stronger. No. 30 tinned wire seems to be the most suitable of any wire used for frames.

Extracted honey can be produced for less money than that in comb because the empty combs can be used over and over again, year after year. It takes anywhere from five to fifteen pounds of honey for the bees to produce a pound of wax.

HONEY EXTRACTOR

If six or eight hives of bees are kept, it will pay to invest in a honey extractor. Each comb has a series of honey cells on each side which when filled with honey are capped over with a thin film of wax. This capping is sliced off with a sharp bladed knife made for the purpose. The

combs, with the capping so removed, are placed in the baskets of a honey extractor. The honey is thrown out of the cells by centrifugal force from the side next the can. The machine is stopped and the frames reversed when the reel is again started, by means of a handle, throwing the honey out from the other side. When emptied in this way the combs are returned to the hive for the bees to refill, thus saving a lot of tedious wax building.

TAKING BEES FROM THE CELLAR

Watch for the appearance of the pussy-willow bloom, or whatever pollen-bearing plant is earliest in your locality, and if the thermometer has registered 50 degrees fahr. or over during the day and indications point to continued fine weather, it is then time to take the bees from their winter quarters. The plan that has proven most successful to those who practise it is to set the bees out in the evening, commencing about sundown. The bees do not fly out of the hive until the following day and then come out a few at a time and will not mix or rob.

It is a mistake to take the bees out on a fine warm morning. About noon when the sun is hot, the bees will be having a great fly, then the wind will spring up and the bees will drift, leaving the hives at one end filled up with bees while at the other side of the yard are weak colonies which will yield a small surplus this season.

If some of the hives are taken out one evening and the balance the following night, the ones taken out first will be liable to rob the ones taken out last.

The best plan, then, is to take them all from the cellar the same night, starting at sundown.

SPRING MANAGEMENT

There are a number of things that have to be taken into account in spring management of bees. They may do poorly during the spring because they have wintered poorly, leaving the hive with only a few weak bees. The hive may be a poor one, having cracks or openings; or it might be set in an exposed place where persistent winds keep the inside temperature down and compel the nurse bees to huddle together, thus restricting the size of the brood nest. The hive may have a poor queen; or food might be so scarce that the bees are having a hard time to keep themselves, let alone to rear brood. The brood chamber may be crowded with old honey, thus depriving the queen of laying space.

SAVE THE BEES WORK

The first real warm day after the bees have been set on the summer stands provide yourself with an extra bottom-board, exchange it for that of No. 1

which, after thorough scraping, you exchange for No. 2, and so on through your apiary. This saves the bees a lot of hard work cleaning out the refuse that may have accumulated on the bottom-board during the winter.

On no account remove the covers until settled weather, as the brood is easily chilled. When the bees are flying freely, examine each colony to see that it has a laying queen and plenty of stores.



A corner of A. T. Harper's Apiary, Odanah Municipality, Manitoba

If, when looking through the hives, you do not discover a queen or eggs, it is necessary either to introduce a fertilized queen or unite this colony with some weak one having a laying queen. This can be done by placing the queenless colony on one having a queen with only a single sheet of newspaper between the hive bodies. In twenty-four hours the bees will have opened communication and in a day or two you may remove the paper and shake or otherwise transfer the top story bees to the lower, returning the balance of the colony to the storehouse.

If the bees have plenty of sealed stores it is a good plan to break the capping of some of the combs as unsealed honey; this incites the queen to lay a large number of eggs.

Some light hives contain very little honey and combs can easily be spared. It is well in this case to help out the weak ones by taking from the strong. If this becomes necessary, stimulative feeding will be found to command combs of honey from heavy hives, to help out the weak.

SPRING

A syrup sufficient for spring feeding can be granulated sugar and should be poured on and the mixture is all dissolved.



Uncapping the Cells.

FEEDING

ly thick for early made of equal parts water. The water the sugar boiling hot stirred until the sugar

EMPTY COMBS USED AS A FEEDER

Fill the cells of empty combs with syrup and hang them in the brood chamber next the brood. Outside feeding is practised by some, but is rather a dangerous practise, as it is liable to start the bees robbing from each other. Do not feed unless it is necessary and unless you are an experienced beekeeper.

Spring care is very important and the idea of the beekeeper is to have the bees hatch as many young as possible during the early part of the season so as to have a large force of workers to gather the honey crop during the nectar flow in midsummer. This can be accomplished by conserving the heat of the hive in the early spring, by having good queens and by practising stimulative feeding, if necessary.

SUMMER CARE

Excessive swarming must be prevented if a large honey crop is wished. As the strength of the colony increases and the weather becomes warmer enlarge the entrance gradually until about June the first or tenth, according to the season, when all except weak colonies should be given an entrance, measuring the full width of the hive and an inch and a quarter deep.

Every colony that is found to have its brood chamber crowded should be given an extra set of worker combs in a deep super, so that the queen may have sufficient empty combs in which to deposit her eggs.

PREVENTION OF SWARMING

In order to prevent swarming it is necessary to remove the causes as far as is possible. The essentials for swarm control are room, ventilation and shade given in time; also good young queens of a non-swarming strain.



Removing the Quilt.

NATURAL SWARMING

The beginner is recommended to increase by natural swarming until such time as he has had enough experience to enable him to increase by dividing the colony or practise what is known as artificial swarming. Allow but a limited number of swarms and let them be strong and early. Late swarms should be returned to the parent hive about twenty-four hours after hiving them.

If you desire to make sure of new swarms clip the queen's wings. This can be done, as shown opposite, by holding the queen with the first finger and thumb of the left hand. Another method is to clip the queen's wings on the comb without taking her in the fingers. When this is done it is well to have a small seissors having a bent point.

CLIPPING QUEEN'S WINGS

Do not allow bees to hang out in front of the hive, as it shows that they are uncomfortable in it, or do not have sufficient room. They should be given more air, shade, or room according to the circumstances.

SWARM CLUSTERS

When the swarm issues it generally settles on the limb of a bush or tree near the parent hive. If the limb of the tree is a small one and can be spared the swarm is readily hived by cutting off the branch and shaking the bees on the ground, or on a white sheet at the entrance of the new hive. The bees will then make their way into the new hive, thus giving us our new colony. In the new hive the frames may be supplied with full sheets of foundation or drawn out combs if available.

Swarming is a natural habit with the bees and therefore the prevention



Board Feeder.

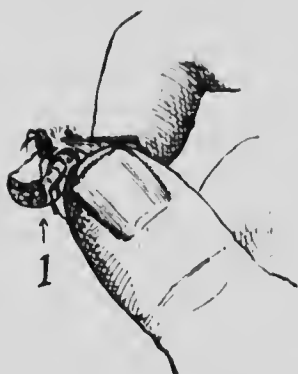
of swarming is more or less of a problem. It is important that a person keeping bees should study their habits, as success depends chiefly upon a thorough knowledge of the condition existing in each hive. Know the queens in each hive, study them and keep notes as to their age and ability to lay eggs. The old queen always goes out with the first swarm unless she is unable to fly.

THE HONEY CROP

As before stated, if six hives or more are kept it will pay to purchase a honey extractor and thus save the bees a lot of tedious way building, by



One Method of clipping the Queen Bee's wings.



returning the empty frames to the hive to be refilled. During the warm part of the summer, from about the middle of May to the middle of August, it is well to have a certain day each week to look through the hives. Examine the hives during the warm part of the day when the bees are busy. Take off the cover and blow a few puffs of smoke under the cloth which is on top of the frames. Then wait a few

minutes before taking off the cloth to examine the frames.

If an extractor is used, it is well to take the frames out and extract the honey when about one-third of the cells are capped over. This will vary with the weather conditions and the dryness of the atmosphere in which the extracted honey is to be kept.

If the weather has been dry, the honey can be extracted before it is capped, thus saving the bees labor; but if the weather is damp it is well to let the honey ripen in the hive.

If only one or two hives are kept, a person can get his honey crop as chunk honey. By using light foundation in all but the bottom hive or brood nest the beginner is able to obtain his honey crop with very little trouble. When the frames in the supers or top stories are filled with honey and capped, they can be taken from the hive and the bees brushed off by means of a bee-brush.

The honey-comb can then be removed from the frames by means of a knife, care being taken to leave about one inch next the top bar for the bees to start building from.

Honey taken from the hive in this way is known as chunk honey.

In working for comb honey in one-pound sections greater care and more experience is needed; so the beginner is advised to go in for either chunk or extracted honey. Some beekeepers follow



Smoking down the Bees.

the practice of using a number of supers, placing an empty one underneath the super that has been filled, by this method the honey can all be taken at one operation thus saving time.

BEE ESCAPES

A bee escape, as shown on Page 20 is used by many. This escape is set into the board the size of the top of the hive. This escape allows the bees to get from the super down past the little spring and into the brood chamber where they are made to get back up again. The super in this way is freed from bees and the honey can be taken from the hive. This also gets rid of the danger of being stung, and of killing bees.

HONEY

In the West are found flowers from which the honey. Some of our very valuable honey-following list includes important honey and Manitoba Wild plum, osier dogwood, willow, hawthorn, strawberry, mustards, raspberry, plants, fire weed, golden



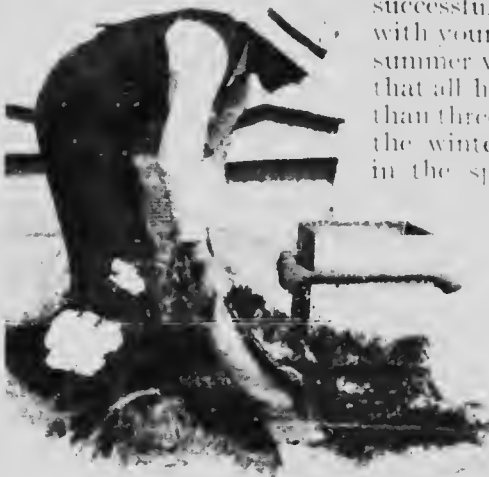
A Swarm at the M.A.C.

PLANTS

a great variety of wild bees are able to gather cultivated crops are also producing plants. The a number of the more pollen plants found in cherry, dandelion, red poplars, ash, sugar maple, anemone, basswood, thistles, clovers, gum rod, asters, etc.

FALL CARE AND WINTERING

It has been said that the success of wintering depends upon the summer care and that the success of the honey crop depends largely upon the wintering and spring care. This is very true because it should be the aim of the beekeeper to keep his colonies strong at all times. In preparing the bees for winter it is well to see that the hives have all good queens that will lay eggs



Shaking the Bees in front of the Hive.

well on in the fall, because it is necessary for successful wintering to have the hives well filled with young bees. The bees that have worked one summer will not live over until the next. Be sure that all hives have laying queens that are not more than three years old, as old queens often die during the winter months, leaving the colony queenless in the spring; consequently the colony will not increase but gradually dwindle away.

The best time to get rid of old queens is in July.

If brood rearing is continued until the end of September or middle of October there will be a good crop of young bees and the hives should come out of the winter quarters in good condition. It is preferable to have six, seven, or more, frames covered with bees and about four or five frames of sealed honey in

the hive for winter. There will be about twenty pounds of food for winter which is a liberal supply. The average amount of honey produced in Manitoba is about eleven pounds.

OUTDOOR WINTERING

In some parts of the West bees are wintered outdoors. This is not a general practise and is one where the beekeeper is taking a big risk.

If the bees are to be kept outdoors, a shelter should be built for them. The entrance should be closed during the winter months. The bees are not to be fed during the winter. The temperature should not fall below 35 degrees Fahrenheit.



Brushing off the few adhering Bees.

PROPER VENTILATION

The cellar or basement should be kept dry as moisture in the cellar during the winter is very harmful.

It is desirable that a constant ventilation be maintained in the cellar during the winter months. If the temperature in the cellar is below 35 degrees Fahrenheit, the bees will become restless and should be admitted to the cellar by opening the ventilator. If the cellar is located in a basement or cellar of the dwelling house, the temperature should be kept above 50 degrees Fahrenheit.

If a person does not have a cellar or basement or cellar, the bees can be wintered successfully in a well-made outside root-cellar having proper ventilation and drainage.

WHEN TO PUT THEM IN CELLAR

The bees can be put away for the winter about the middle of November or on the approach of severe weather. A reliable thermometer should be kept in the bee-cellar so that the exact temperature can be noted at any time.



A Swarm easy to handle by sawing off the small limb.

Place the hives on shelves about one foot from the floor. The front entrance is left wide open during the winter and if the cellar is rather warm it is well to remove the hive covers. The bees should be kept as quiet as possible during the winter. Have the rear of the hives slightly higher than the entrance.

ROBBING

Robbing is started by carelessness on the part of the beekeeper in opening hives, or leaving honey exposed, or by feeding during the warm part of the day either in the spring or fall when flowers are scarce. To prevent

robbing contract the entrance of the hive by means of a block of wood. Prevention, however, is vastly better than cure. Do not open hives when there is no honey coming in unless it is necessary, and be careful not to leave honey or sugar exposed. Bees are not disposed to rob during the summer when they are able to gather from the flowers. During the spring and fall when the bees are not so busy there is danger of their robbing, so care should be taken to prevent this.

STUDY THE HABITS OF THE BEES

It is important that a person keeping bees should study their habits. Success depends largely upon a thorough knowledge of the condition of the hive. It is a mistake to suppose that the chief characteristic of a bee is to sting, because by proper care and handling the chance of being stung is very small. Examine the hives only during the warm part of the day when the bees are busy. Wear light colored clothing, as bees do not like black; and when looking at the combs, etc., be careful to avoid rapid or jerking movements.



Hives Wintering Outdoors.

WHO SHOULD KEEP BEES

In Manitoba we have a large number of men and women who are successful beekeepers; and there is room for many more, as it would be hard to find a place where a few colonies of bees would not yield a fair honey crop during an average year. Every farm could have a few hives and thus obtain one of the most delicious and healthy foods at a very small cost.

Professional men, merchants, tradesmen, poultrymen and market gardeners, whether situated in a small town or in the city, can keep bees with profit and pleasure.

BEE DISEASES

Bee disease is one of the problems that beekeepers in the U.S. and Ontario have to contend with. Fortunately for us in Manitoba, our bees are almost free from disease. American and European "Foul Brood" are the most harmful diseases of bees found on the American Continent. These two diseases are caused by germs that attack the hatching brood, killing it, and thus proving very harmful.

Spring chilling of brood sometimes is mistaken by beginners for foul brood. If, however, dead brood is found during the warm part of the summer, it would be wise to have your apiary inspected by the Government inspector.



Bee Trap.

EUROPEAN FOUL BROOD

European Foul Brood is most prevalent in the East, so our risk of infection is from imported bees. It attacks the larvae earlier than does American Foul Brood; hence only a small number of the diseased larvae are ever capped. Those that are capped over have the sunken and perforated appearance as in the case of the American form.

After death the affected larvae turn first yellow, then brown, finally almost black. When the tooth-pick test is tried, the decaying matter very rarely stretches out in a long thread.

There is very little odor from the decaying larvae and it is not nearly so noticeable as the "glue pot" smell of American Foul Brood. The pure-bred Italian bee seems to be immune to this disease. The remedy then is to Italianize your apiary. This can be done by killing the black queens and introducing properly mated Italian queens in their stead.



Red Clover near Gladstone

AMERICAN FOUL BROOD

In ordinary conditions the dead larvae are removed by the workers, and the queen deposits another egg in the cell. But the odor given off by the larvae that have died of "Foul Brood" appears to overpower even the most enthusiastic workers, so the dead maggots are permitted to remain in the cells.

In American Foul Brood death seems to occur after the cells have been capped over, so when the workers find cells that refuse to hatch they puncture the cappings, in order to remove the dead matter, but are driven from the task by the offensive smell. The first suspicious sign therefore, is a number of scattered cells whose cappings have been perforated by the workers and left in that condition. Further investigation is necessary. This is done by means of a tooth-pick, a match, or a sliver of wood sharpened to a point. The tooth-pick is pushed into the dead maggot then slowly withdrawn. If the decaying matter adheres to the point of the wood and stretches out like melted glue, then the probability is that American Foul Brood was the cause of death.

A hive affected by American Foul Brood has a very characteristic odor, resembling a poor quality of glue. In the early stages it is not very pronounced but grows stronger as the disease spreads.

It must be understood that these diseases are caused by a specific organism or germ and can not occur spontaneously; but must be introduced into the apiary in some way. Honey is one of the great carriers of disease. The dissemination of the disease is often rapid, because of the fact that the diseased colony is weak-



Many Women are good Beekeepers.

ened, and so becomes a prey to robber bees from other hives who carry the disease home with them.

The Manitoba Legislature has seen fit to enact a "Foul Brood Law" as follows:

CHAPTER 39

An Act for the Suppression of Foul Brood Among Bees

(Assented to February 20th, 1914.)



Smoking the Hive.

His Majesty, by and with the advice and consent of the Legislative Assembly of Manitoba, enacts as follows:—

1. In this Act and in any orders or regulations passed under the authority of any of the provisions herein, unless the context otherwise requires

(a) "Minister" shall mean the Minister of Agriculture and Immigration;

(b) "Deputy Minister" shall mean the Deputy Minister of Agriculture and Immigration;

(c) "Inspector" shall mean inspector of apiaries.

2. The Minister may appoint one or more persons to be known as "inspector or inspectors of apiaries," whose duty it shall be, whenever so directed by the Minister or Deputy Minister, to visit without unnecessary delay any locality

in the Province of Manitoba and there examine any apiary or apiaries to which the said Minister or Deputy Minister may direct him, or them, and ascertain whether or not the disease known as "foul brood" exists in such apiary or apiaries, and wherever the inspector is satisfied of the existence of foul brood in its virulent or malignant type, it shall be the duty of the inspector to order all colonies so affected, together with the hives occupied by them, and the contents of such hives, and all tainted appurtenances that cannot be disinfected, to be immediately destroyed by fire under the personal direction and superintendence of said inspector, and after inspecting infected hives or fixtures or handling diseased bees, the inspector shall, before leaving the premises or proceeding to any other apiary, thoroughly disinfect his own person and clothing, and shall see that any assistant with him also disinfects his person and clothing; but when the inspector is satisfied that a disease exists, but only in milder types and in its incipient stages, and is being or may be treated successfully, and the inspector has reason to believe that it may be entirely cured, then the inspector may in his own discretion omit to destroy or order the destruction of the colonies and hives in which the disease exists.

3. The appointment provided for in the foregoing section shall be made under the hand of the Minister.



Note Dress and Equipment.

4. Any inspector appointed under the provisions of the foregoing sections, on entering upon any premises in the discharge of his duties, shall, if so required, produce the certificate of appointment above mentioned.

5. The inspector shall have full power, in his discretion, to order any owner or possessor of bees dwelling in box hives, in apiaries where the disease exists (being mere boxes without frames) to transfer such bees to moveable frame hives within the time specified by the inspector, and in default of such transfer the inspector may destroy, or order the destruction of, such box hives and the bees dwelling therein.

6. Any owner or possessor of diseased bees, or of any infected appliances for bee-keeping, who knowingly sells, or barter, or gives away such diseased colonies or infected appliances shall, on conviction thereof, before any justice of the peace, be liable to a fine of not less than \$25 and not more than \$50, or in default of payment to imprisonment for any term not exceeding two months.

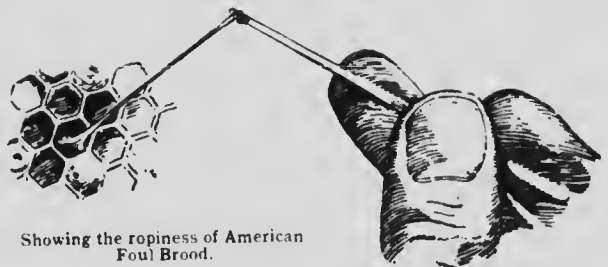
7. Any person whose bees have been destroyed or treated for foul brood, who sells, or offers for sale, any bees, hives or appurtenances of any kind, after such destruction or treatment, and before being authorized by the inspector so to do, or who exposes in his bee-yard, or elsewhere, any infected comb, honey or other infected thing, or conceals the fact that said disease exists among his bees, shall, on conviction before a justice of the peace, be liable to a fine of not less than \$20 and not more than \$50, or in default of payment, to imprisonment for a term not exceeding two months.

8. Any owner or possessor of bees who refuses to allow the inspector or inspectors to freely examine said bees or the premises in which they are kept, or who refuses to destroy the infected bees and appurtenances, or to permit them to be destroyed when so directed by the inspector, may, on the complaint of the inspector, be summoned before a justice of the peace and, on conviction, shall be liable to a fine of not less than \$25 and not more than \$50 for the first offence, and not less than \$50 and not more than \$100 for the second or any subsequent offence, and the said justice of the peace shall make an order directing the said owner or possessor forthwith to carry out the directions of the inspector.

9. Where any owner or possessor of bees disobeys the directions of the said inspector or offers resistance to, or obstructs the said inspector, a justice of the peace may, upon the complaint of the said inspector, cause a sufficient number of special constables to be sworn in, and such special constables shall, under the direction of the said inspector proceed to the premises of such owner or possessor and assist the inspector to seize all the diseased colonies and affected appurtenances and burn them forthwith, and if necessary the said inspector or constables may arrest the said owner or possessor and bring him before a justice of the peace to be dealt with according to the provisions of the preceding sections of this Act.

10. Before proceeding against any person before a justice of the peace, the said inspector shall read over to such person the provisions of this Act, or shall cause a copy thereof to be delivered to such person.

11. Every bee-keeper or other person who is aware of the existence of foul brood, either in his own apiary or elsewhere, shall immediately notify the Minister or Deputy Minister of



Showing the ropiness of American Foul Brood.

the existence of such disease, and in default of so doing shall, on summary conviction before a justice of the peace, be liable to a fine of \$5 and costs.

12. Upon receiving the notice in the preceding section mentioned or in any way becoming aware of the existence of foul brood in any locality, the Minister or Deputy Minister shall immediately direct the inspector to proceed to and inspect the infected premises.

13. The inspector shall, immediately on return from an inspection, make a report to the Minister showing the work done during such inspection, including the number of colonies visited, the number disinfected, and the number destroyed by his order, also the locality in which same were found.

14. The Minister may from time to time make such rules and regulations as he may deem necessary for the control and guidance of the inspector in carrying out the provisions of this Act.

15. This Act shall come into force on the day it is assented to.

BEEKEEPERS' ORGANIZATIONS

A lesson we learn from the bees themselves is that organization and co-operation is in the best interests of the members of any community, providing they are working in unison towards similar ends. The Manitoba Bee-keepers' Association is one that should prove of benefit to its members. Some of the advantages that might accrue from an organization of this kind are co-operative buying of supplies and the advertising and selling of honey and wax. The annual meeting would afford a means of beekeepers getting together and discussing the various phases of the business. Organization, too, is necessary successfully to combat the much-dreaded foul brood disease.

BEE BOOKS—Practical Works on Bees

"A.B.C. and X.Y.Z. of Bee Culture," by A. I. and E. R. Root—An encyclopaedia, describing everything pertaining to the care of the honey bee.

Langstroth on the Honey Bee, revised by Dadent.

Any of the following Bulletins or Circulars may be obtained free on request from the Extension Department, Manitoba Agricultural College, Winnipeg.

BULLETINS

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| 1—Horses. | 11—Canning and Preserving. |
| 2—Twelve Noxious Weeds. | 12—The Farm Stock. |
| 3—Care of Milk and Cream. | 13—Barn Ventilation. |
| 4—Protection of Farm Buildings from Lightning | 14—Care of Cream for Creameries. |
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| 9—Repairing Farm Equipment and Roads. | 20—College Extension Service. |
| 10—Plans for Farm Buildings. | |

CIRCULARS

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| 1—The Farmers' Beef Ring. | 16—Fork Making on the Farm. |
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