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PRACTICAL HINTS

— O N —

Bee Culture.

By DON J. ARNOLD.

BROWNVILLE, NEB.:
ADVERTISER BOOK AND JOB PRINT.
1874.

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Hints on Bee Culture.

HISTORY OF THE BEE.

The Creator gave to man the sovereignty over all the creatures that dwell on the face of the earth, and many of them seem instinctively to prefer his society and his service.

Least of them all is the "LITTLE BUSY BEE," the patient gatherer of sweets, the frugal storer of the fruit of its toil, and hence the world's accepted symbol of industry and thrift.

It chooses its field of labor in the neighborhood of human habitations ; avoiding the unbroken wastes of forests and the trackless desert alike.

The almost limitless prairies, covered though they be with rich flowers through all

the season, nevertheless furnish but little that invites the coming of the bee. Most civilized people are familiar with this exquisite little worker, yet they are familiar only with its general appearance and industrious habits. Much that is of great value respecting its nature, and the condition under which it is most useful to man, the majority of men do not seem to know.

And yet the multitudes who know but little about them, have undertaken to keep bees, and have hoped to gain much profit therefrom. Successful bee culture has, however, been exceedingly rare. And no wonder. It was a most unreasonable expectation, that of successful treatment, where men were ignorant of the wants of the domesticated insect and the necessary conditions of its existence.

Who was the first keeper of bees, history does not say. So useful a servant to man, we conclude, however, must have shared with him the delights of the original garden,

where were all manner of fruits; and doubtless all the honey laden flowers also. Moreover, from the singular persistency with which our humble insect friend chooses the sweet and leaves the bitter behind, we judge that it was superior to the flattery that persuaded our first mother to pluck and eat the forbidden fruit. In the far east, the nativity of our race, we shall, without doubt, locate the nativity of the bee.

Nor was it because of any evil it had done that the world was destroyed with a flood. And when all the gardens and fields were submerged, we fancy he required only a quiet, snug little chamber, just under the roof of the ark, whence he foraged on the good things that father Noah had stored away for the comfort of his somewhat varied family ; and, when the waters were dried up again, and the flowering plants sprang up, it went forth from Ararat to sweeten the toils of humanity in every land to which toiling men should go.

The honey bee exists in a community, which we call a SWARM, or a COLONY. Every swarm contains three kinds of bees. The QUEEN is the head of the community. No swarm can maintain its existence for any great length of time without a queen. The DRONES are the "gentlemen" of the community. To them nature has denied the ability to perform the work of gathering honey, or of secreting wax. The proboscis of the drone is not of sufficient length to be available in extracting the honey from the flowers. No little grooves upon his leg serves as baskets for the pollen. It is the office of the drone to impregnate the queen.

As the season approaches for swarming, the young drones make their appearance, and sport themselves in the sunshine on pleasant days during the middle of the day. In a large swarm there are 1,500 to 2,000 drones. But by far the most numerous class of bees in every swarm are the workers, which range from 20,000 to 60,000 in a swarm.

A more particular description of these different kinds of bees will be acceptable to those whose interests are involved in their culture.

THE QUEEN.

In form, the Queen bee is long and slender, compared with the Drone. Her wings are short, covering only about one-half of her body. Her posterior is delicately tapering. When on the wing, she carries it curved downward and forward; and when moving about in the hive, she draws it along on the surface on which she moves.

The Queen is armed with a sting which she uses only in her combats with a rival Queen. You can handle her without fear, as she was never known to sting a person.

The Queen is fed by the nurse bees, and my observation has led me to the conclusion that she is fed the same kind of partially digested food that is given to the larva.

The office of the Queen, as before inti-

mated, is to keep up the stock of bees. SHE ONLY LAYS EGGS. She is capable of laying from two to three thousand eggs in a day.

The virgin Queen is capable of laying eggs, and these eggs will hatch out drones. Only after she has had connection with a drone can the Queen lay eggs which will produce workers.

It is a known fact, also, that a Queen, after impregnation, is capable of laying eggs from which both workers and drones will be hatched. Moreover, the same egg will produce a worker or a queen. But how? Some have claimed that when a queen is wanted the worker bees prepare a queen cell in which she lays a queen egg, and this will inevitably produce a queen. Others claim that it depends on the food with which the larva is fed after it is hatched, whether it shall become a worker or a queen. If the workers choose to make it a queen, they feed it "royal jelly;" if they choose to make it a worker, they bring it up on ordinary food.

My opinion is, that a queen comes from the fertilized egg from which the worker comes. The larva is the same, whether it is to become a worker or a queen. And I have been unable to detect any difference in the food given to them respectively. The determination does not, then, depend on the egg nor on the food. I conclude that it depends solely on the cell. The queen is the perfectly developed female. The worker is an imperfectly developed female. The worker is dwarfed, by the smallness of the cell in which it undergoes its transformation from the egg to the larva, from the larva to the winged insect, the matured bee.

DRONES.

The Drones are hatched from the unfertilized eggs. They occupy the store-cells of the comb, which are considerably larger than the worker brood-cells. It would seem to imply a degree of intelligence on the part of the queen, that she invariably selects these

larger cells for the eggs of the drones. The drone is much larger and more clumsily formed than the worker ; his jaws are shorter, his body thicker, his wings longer and broader, and his posterior extremity is more blunt, and invested with a hairy appendage. Having no sting, they are without defense.

They begin to appear in April, and will continue to increase for several months, provided the season be favorable for gathering honey, and consequently for multiplying colonies.

But in an unfavorable season, the workers seem to become apprehensive of a short supply of food, and they early commence the work of destroying the drones, as an unnecessary burden on the community. Nor are they, in this, guilty of a mistaken policy, for the drones are enormous consumers of the sweet stores which their little sisters, with much labor, have gathered. The observant bee-keeper may himself find his interest in

taking counsel of the workers, and in uniting with them in disposing of the unprofitable drones.

THE WORKERS.

The attention of the saunterer is often attracted to the behaviour of a bee that has just lit on a flower before him. How briskly she travels over its surface, scenting the deposits of sweetness ; how she plunges her head and shoulders into the central cavity ; how she manipulates the anthers, and appropriates the pollen from them ; and when she has exhausted the supply, or has obtained all the lading she can carry, how cheerfully she hies away to her home. This is one of the workers. You will notice that she is smaller than either queen or drone. Her form is trim and neat ; her wings are slight but strong. Her hind legs are provided with minute concavities in which she packs away the pollen, employing her feet in the operation. Underneath her abdomen she is furnished

with six overlapping, scale-like membranes, which form pockets, within which she secretes the wax. The wax is produced through digestion of food of the bee, much as the fat of other animals is produced.

The honey, as it is gathered, is taken into the honey-bag, which is an oval sack about the size of a grain of wheat, lying in front of the true stomach, with which it also communicates. The amount of honey, therefore, which a bee can carry home each trip she makes, is but a small drop. Yet, in proportion to her size, we must admit that it is something considerable. Let us follow her to the hive. Arriving there, she goes straight to the store-comb, where she empties her honey-sack into one of the cells.

She is armed with a sting, which nature intended, not so much for her own protection, as for the protection of the community of which she is a member. In many cases, and, indeed, in all cases where she inflicts a wound with her sting on the large animals,

she sacrifices her own life. The sting itself is connected with a little sack in which a poison fluid is secreted which follows the sting, and causes the intense suffering which most men have at some time experienced.

As in human society there are various classes, and in every great industrial enterprise there are various stations and duties assigned to individuals, so, in the bee community, there is a division of labor and of responsibility. In every hive there is a detachment of workers, whose duty it is to guard the entrance; another detachment, whose duty it is to feed and care for the young; another detachment is employed in building comb; but the greater number are engaged in the work of gathering honey and storing it away in the cells.

Sometimes the comb is situated where it is inconvenient for the heavily laden bee to reach it. She cannot very well fly to it inside the hive, where so many of her companions are moving about, and it is not conven-

ient to reach it by a round-about way. Then the bees make a curious ladder, by suspending one from another, the first one being suspended from a fixed spot at the top. The worker comes home with her load, enters the hive, begins the ascent of the living ladder, and reaches her destination successfully.

COMB BUILDING.

We have mentioned that the bee's comb is a secretion in the bee analogous to that of the fat in other animals. But there is this difference: 1st. The animal is unconscious of the formation of the fat, while the bee holds the secretion of wax under her control. 2nd. The fat of animals is chiefly deposited within them, while the wax is accumulated in the little external pockets which have been already described.

The production of wax renders it necessary for the bee to consume more than the usual amount of honey and pollen. Different authors differ in reference to the quantity

of honey consumed in the operation of producing a pound of comb. Dzierzon says it requires twenty pounds; Kretchner says thirteen pounds, and Dr. Kirtland says twenty-five pounds.

The materials are passed from the honey-bag into the true stomach, where they are digested. After about twenty-four hours they enter into the blood from which the wax is secreted by the organs which nature has provided for that purpose.

In the work of building the comb, each builder is her own hod-carrier, so to speak; for each comes to the structure with just that amount of material that has been prepared within herself, and put away in her little wax pockets. Now the first thing she does is to seize hold of the little flake of wax contained in one of these pockets, which she does with her hind feet; next, she passes it forward, seizes it in her mandibles, and with her fore feet, her mandibles and proboscis, works and kneads the flakes together into a consistency

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suited to her use ; and then, beginning at the top, she lays down the adhesive substance on the surface from which she wishes to suspend the comb.

Just here human invention has found one of its golden opportunities to interfere and guide the instinctive operations of the bee, for the profit of man. This it has done by arranging in the hive the simple device known as the movable-comb frame.

Having prepared her "base of operations," she builds downward. The comb consists of a double series of hexagonal or six-sided cells, separated at their bases by a thin partition. These cells are not built opposite each other, but the walls of one cell arise from the centre of the cell which stands on the opposite side of the partition, or floor. As the comb hangs vertically in the hive, the cells are built not exactly horizontally, but slightly curved upward, so that, as they grow, honey can be stored in them without loss.

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USES OF THE CELLS.

The FIRST use which a new colony of bees makes of its comb, is to store its own provisions of honey and pollen. Very soon the Queen commences depositing eggs in the cells, and the larvæ appear within three days thereafter. In the early part of the season the bees build brood cells chiefly, in the latter part of the season they build store cells almost exclusively.

BREEDING.

A stock of bees can only be kept vigorous by the breeding of new stock. But the production of young bees depends chiefly on the production of bee-food. No matter how strong the original stock is, if the season is unfavorable, the stock is almost certain to diminish. But if the season be favorable, so that an abundant supply of honey and bee-bread can be provided, then the in-

instinct of reproduction will be sure to be active. Abundance of eggs will be deposited, and the workers will give all needed attention to the rearing of the young.

For this reason it is of importance that the keeper of bees shall see to it that his bees are furnished with sufficient food before the opening of the season, and at any time when, during the season, the natural supply runs short. The movable comb frame is of inestimable advantage for feeding bees, because it can be placed where they, with the least trouble and excitement, can enjoy its use.

If the food supply be furnished them early, there will be no lack of workers to gather the crop of honey which the first spring flowers offer; but, if the supply of food be suffered to become short, the result will be an enfeebled stock, which will be in danger of remaining feeble and inefficient through the season.

STAGES OF BEE LIFE.

We have spoken of the act of the queen in depositing an egg in the bottom of the brood-cell. The egg is attached by its end to the centre of the bottom of the cell, where it remains for three days, when it hatches an active little worm or larva. Now the nurse bees begin the work of feeding. They prepare for the little nursling a milky looking substance, which they furnish in quantities sufficient that it may swim in it. The little grub, having no mouth, is fortunately furnished with absorbents over its whole body, by which it takes up its food while it swims. In this condition it remains about five or six days, the nurse-bees carefully providing the needed supply of chyle. Then the cells are capped over, and the larva is left to develop and undergo its transformation. In about twelve days more it has attained to the character of a bee, and it begins to use its mandibles in uncapping its cell, which it prepares to vacate.

The drone is hatched from the egg in three days, the same as the worker, remains a larva six and a half days, and in about fourteen days more, or on the twenty-fourth day, leaves the cell.

The cell in which the young queen is reared differs from all other cells. It is usually located at or near the edge of the comb. In its external appearance, it strongly resembles a small peanut shell. The walls of the queen cell are thick and strong, its base occupying the room of several ordinary cells, and the body of the cell projecting vertically, so that the head of the young queen is downward. The egg is hatched between the third and fourth day; the larva state continues about five days, when the cell is closed. Meanwhile, the bees show the royal grub every possible attention. It now remains imprisoned about eight days, when she eats her way out.

It sometimes happens that the old queen is still in the hive when the time has come

for the young queen to come forth from the cell. It is then at her peril that she comes out, for one queen can never endure the presence of another queen, and the young one would be almost certainly killed by the old one. To prevent such an unfortunate occurrence, the worker bees instinctively hold back the young queen from going abroad, and guard her by covering her with their own bodies, in such numbers that the old queen cannot reach her.

After the young queen leaves her cell, it is cut down till it has the appearance of a small acorn cup. I have known instances in which the same base has been built upon several times, but never one in which the entire cell has been preserved.

The average life of the workers is about four months. The drones live only at the mercy of the workers, and if the supply of honey is good they are tolerated through most of the season. The queen often lives from three to five years.

BEE FOOD.

Whatever the bee gathers and stores is gathered and stored for food. These stores are chiefly of two kinds, which are known by the name of honey and bee bread. As it would be injurious and often fatal to subsist a horse on grain only, so it would seem to be fatal to the bee to eat honey only. A coarser food is needed to enable the digestive organs to perform their functions. On the same grounds on which it is necessary to give the horse hay, it is necessary that the bee shall have "bread." And nature has provided that the flower from which she extracts the more concentrated food—the honey—shall also afford her the coarser food. Hence, while her proboscis reaches for the sweetness, the legs may be brushing against the anthers of the flowers, and catching the pollen as it falls.

Indirectly the bee, in this busy life of hers, gathering food for herself, performs another service for the benefit of man; for she car-

ries from the anthers of one flower to the pistil of another, the fertilizing dust, without which the season of fruiting would never come.

We have spoken of the larva swimming or floating in a milky looking fluid, in the cell. As to the nature of this fluid, we remark, that inasmuch as it is supplied to the cells by the worker bees, we suppose it to be of the nature of chyle, which they have the ability to raise out of their stomachs and to deposit in the cell.

ENEMIES OF THE BEE.

One of the most destructive enemies of the honey bee is the MOTH, or MILLER. It usually makes its appearance in July, and attacks weak swarms. Strong, vigorous swarms are comparatively free from danger from the attacks of the miller. The egg of the miller is often deposited on the board over which the bee is obliged to pass in entering the hive, and it becomes attached to

her legs and carried in; and it finds a lodgment in the comb on which she is working. Some have suggested that the moth may lay its eggs in the flowers where the bee gathers honey and pollen, and thus it may be introduced into the hive. But it is certain, also, that the miller sometimes enters the hive, when the stock of bees is weak, and deposits its eggs directly in the comb.

It is the moth larva, not the miller, that is so destructive to the bees. Hatching out in the hive, the little grub begins to eat its way through the comb, choosing that part of the comb which is most safe from the attack of the bees. Hence it will often be found to have entirely consumed a large portion of the cell floor, by which it splits the comb throughout much of its extent, while the external portion of the comb is apparently uninjured. In its progress it often cuts away the walls of the brood cells, while the young, immature bees are yet in them, thus destroying large quantities of the brood.

How can this enemy of the bee be met and most successfully resisted? Many devices have been invented, and some of them have been patented.

It is certain that all moth traps are worthless. The eggs that are carried into the hive by the bees themselves are probably more numerous than those that the miller itself deposits there. My experience has produced the conviction that the first great requisite is to keep the stocks strong. It is needful, in the next place, that the bee keeper be able frequently to examine every part of the hive, so that if any moth eggs hatch there, he can immediately remove the infected comb out of the hive. This can be done only with the movable comb hive.

The king bird is also an enemy of the bee. You may see him perched on the limb of a tree, watching. Whenever a bee comes in, overburdened with honey, flying slowly because of her load, he will dart out sud-

denly and devour her. The best remedy for the king bird is the shot gun.

Ants are sometimes very troublesome enemies of the honey bee. I have noticed that the bee fears the ant. He marches boldly into the hive, and takes his fill of honey. Ants, in great numbers, make raids on the same hive, generally choosing the night season for their marauding. There should be no harbor for ants near a hive. No old boards, or chips, or sticks of wood, should be left lying around loose. If ants are detected in the work of foraging on the bees, find their homes, and sprinkle a little FLOUR MIXED WITH CALOMEL over them, which will destroy them. I have tried many things, but nothing equals this.

Toads should be excluded from the vicinity of bee stands, for toads love bees, and are very expert in taking them, especially when they alight for a moment on the ground near them.

MANAGEMENT OF BEES.

The object of keeping bees is profit. If we are not to derive any profit from it, we do not wish to have the trouble of it. Hives cost money. A stock to start with costs money. Time is money. The ground they occupy is worth money. If there is no money to be made by keeping bees, then we do not care to keep them. This, at least, is the GENERAL feeling. And it is right. But it should be understood that there is no profit in bad management, and certainly there is none in the bad management of bees.

In the management of bees, the first great DISIDERATUM is a COMFORTABLE house for the bee to live in. When left to themselves they seldom fail to find such a house in the hollow of a forest tree, and sometimes even in the cavities of rocks. In a domestic state, they are quite contented and happy in the sections of such hollow trees which men have boarded over for their use ; in old style

straw hives ; in the plainest kinds of boxes, etc. In fact, it is not a difficult task to satisfy the taste of the bee, in the matter of a dwelling. She does not demand a great house, with all the modern improvements ; with carpeted halls and parlors, and with folding doors. She is more intent on the geometry of comb-building, than the splendid architecture of the hive.

The whole, or nearly the whole, importance that attaches to the differences in hives, therefore, relates simply to their adaptation to SUCCESSFUL MANAGEMENT. In other words, one hive is better than another hive, just in proportion to its CONVENIENCE in the bee-keeper's treatment of his bees.

We assume that everybody knows how to build an old-fashioned box hive. And, if all you want is to catch the swarm and hive it, and let it fill the hive with honey, and then kill the bees and get the honey, then that old fashioned hive is good enough. But, if you wish to keep the bees over ; if you wish to

guard them against the ravages of the bee moth ; if you wish to encourage them to store more honey than they themselves can consume, and to store it, unmixed with bee-bread and brood, where you can remove it when you choose ; if you wish to have some convenience for feeding them when they get short of provisions, and yet do not wish to subject them to too great exposure, then the old box hive is NOT sufficient. It is possible to meet all these contingencies by combining various devices in the construction of a hive.

In the next place, the proper management of bees requires a suitable location for their dwellings. One bee hive should not be too near another. The keeper should be able to attend to one hive without disturbing the quiet of a whole neighborhood of hives. And the individual colonies should not be in irritable proximity to other colonies. The location of a hive should not be too elevated. A high, naked hill, or spur of a hill, over which the high winds of the spring sweep

mercilessly, is very unfit for the residence of bees. Thus exposed, multitudes are destroyed while returning laden with honey to their homes. A shady, sheltered spot, is necessary. Then the extremes of heat and cold will not imperil the stock.

It is a great folly to let hives stand in the sun and rain. The rain swells the wood, the sun contracts it, producing cracks and warping it out of shape, making openings when there should be tight joints ; giving to the moth an entrance or a cozy place to lay its eggs.

When bees swarm, it is important that the manager be in attendance, and READY. He should previously have decided where his next colony shall be placed. He may have no trouble in hiving them. If they alight in a convenient place, he must go to work, as soon as they have settled down in compact shape, and very quietly and very gently cut the twig on which they rest, and carry it to the place where the hive is waiting, and shake

them off at the entrance of the hive. They will generally enter it and make themselves at home. Sometimes the bees alight on a high limb. Mr. Quinby recommends the use of a basket attached to a pole, in this case. By holding the basket directly under the swarm, and suddenly jarring the limb they fall into the basket and can be carried to the hive. Set the basket down by the hive, and the bees will find the entrance and go in. Sometimes they alight on the heavier limbs, or in the crotch of the tree, and it may be necessary to brush them off with a wing into a pan or basket.

It may also happen that they have made their arrangements to go away. Many expedients, such as rattling pans, ringing bells, throwing sand among them, showering them with water, flashing the sunlight upon them by mirrors, etc., etc., have been recommended to keep bees from leaving. I have no faith in any of these performances. I know of but one preventative. By means of the

movable comb hive they may be artificially swarmed, or divided, a little in advance of the time when they would swarm naturally, and thus they will be contented to remain in their quarters. And I remark, also, that this is the ONLY TIME when artificial swarming should be practiced, because, at this time the bees are PREPARED for the work of fitting up their new abode. They have an extraordinary stock of wax in their wax pouches, and they are holding their store of honey in their honey bags, for their use while settling down in their new home. To divide a swarm at any other time is to put the new colony, and generally both, at a great disadvantage in the outset of their separate existence. If the season is VERY favorable, they may do well; but if not, they will be very likely to do very poorly. The chances are against them. In the management of bees, the next important item is this—THE KEEPER MUST VISIT AND CAREFULLY OBSERVE THEM FREQUENTLY. He must study their habits. He will soon be

able to tell when they are doing well. He will see if they go out and in as if they were intent on regular business, or if they are restless, distracted, or inactive. Their conduct will soon inform him whether they are able to reach good pasturage or not; and whether they are suffering any annoyance or not. If he see signs of discontent or distress, he should suspect the presence of some enemy of the bee. Then he should carry his examination to the inside of the hive, carefully lifting out the comb frames, and noting if any foe has gained an entrance.

In good seasons, the bees will gather a surplus of honey, and the keeper will wish to remove it. For this purpose hives, are constructed with separate chambers, or receptacles, for storing the surplus. In these boxes, the bees will store nothing but the pure honey. In the body of the hive, the comb will be found to contain honey, bee-bread and brood.

When the little boxes are filled, you re-

move them, and put empty ones in their places. When a box is removed, it will generally be found that a number of bees remain in it, and when it is set away from the hive for the bees to leave, others will come and commence the work of carrying off the contents of the box. A good plan is to set the boxes reversed in a tub, and spread a sheet over the tub. The bees will leave the boxes, and outsiders cannot enter. When all are out, remove the sheet, shake or brush the bees off. When the honey box is to be put in its place, it is an excellent plan to take a piece of clean, empty comb, cut its upper side straight, warm it, and then attach it to the roof of the box, in the direction you wish the comb to be built. The bees will commence working in the box much sooner than they otherwise would.

Bees should be protected against the extreme cold and sudden changes of the winter. For this purpose a dry, airy cellar, where the temperature can be kept near the freezing

point, is recommended. But if they are left out doors, they should be carefully watched to prevent accumulation of snow or dust about the openings, and to keep up the necessary ventillation

Before putting bees into winter quarters, the supplies of food should be so equalized that there shall be no lack in any hive. This can be done by removing comb-frames, with the honey, from those that are well supplied to those that lack.

Honey boxes that contain comb, or honey, should be removed, and empty ones put in their places.

BEE PASTURE.

The flowers of most forest and fruit trees, and shrubs, as well as those of many herbs, yield either honey or pollen, or both, to the industry of the bee. It is an advantage to the bee-keeper, however, to be in the neighborhood of timber, because much of the earliest supply is found in the tree flowers.

But there are times in the seasons when the natural supply becomes scant, and it is important that provision be made in anticipation of such times. One of the very best plants to be cultivated for this purpose is the white clover ; both because it continues so long in bloom, and because it yields the purest and finest honey. It can be grown, also, in places that would otherwise be waste. The Alsike clover is nearly as valuable as the white. Some persons esteem it even more highly.

WORKING AMONG BEES.

When coming near a hive, avoid all hasty movements. Do everything deliberately. If you wish to work about the hive, carry a little bunch of cotton rags on fire with you, and blow some of its smoke into the hive. The startled bees will immediately fill themselves with honey ; and after this they will be amiable enough. You can do what you wish with them without danger of being stung.

PROFITS OF BEE CULTURE.

It is a source of great pleasure to one whose time is not occupied with other and severer labors, to observe the habits, and give the benefit of his care to the industrious community of bees, whose whole life is spent in gathering and storing away sweetness.

Many a man would live longer if he would relax the mental strain which his business has wrought up to such fearful tension, that a slight increase must cause it to snap ; and I know of no employment better suited to such needful relaxation than the culture of bees.

It is also decidedly pleasant to be able to place a nice comb of clear, white honey before a guest ; and it does not detract from the pleasure, to be able to show him the chamber in which the little workers are storing away an additional store of the same sort.

Many persons, probably, keep bees for no

other profit than such as I have named. The opinion has extensively prevailed that a large number of swarms could not be profitable kept on the same ground. It is true that ground may be over-crowded with hives. It is not best to place hives too near together. But an ordinary town lot would accomodate several.

The LIMIT of profitable bee culture is exactly the same as the limit of any other profitable business—i. e., it is limited by the CAPABILITY and DILLIGENCE of him who is engaged in it. Whenever a man undertakes so much in any business as to be obliged to slight some part of it, he is sure to loose money. When he does just the amount of business that he can do WELL, he makes it pay.

Bee keeping, on a moderate scale, requires but little time. It is simply recreation. And it may be made profitable as such. And while it makes but slight draft on one's time, it will be financially profitable.

The keeper of a FEW colonies of bees ought to get at least ONE NEW colony from each of the old ones, every year. Sometimes he will get two or more new colonies from each old one. Now, in addition this increase of STOCK, he will have the surplus honey, which will range from forty to one hundred and twenty pounds in ORDINARY years, from swarms of good average strength. It will be seen that several hundred per cent. of profit is almost a certainty. BUT, DO NOT FORGET THAT EVERYTHING DEPENDS ON MANAGEMENT.

REQUISITES OF BEE HIVES.

CAPACITY.—The homestead of the hive should be of the capacity of a little over a bushel. The inside measures which I prefer are— $14\frac{1}{8}$ inches length, $14\frac{1}{8}$ breadth, and 12 inches depth. Above the homestead there should be a chamber of two-thirds the capacity of the homestead, in which the honey boxes, or surplus comb-frames are to be

placed. Movable-comb frames should be used in the homestead.

CONVENIENCE.—Convenience is a prime quality in the residence of man, and in the hive of the bee. It should not be too far from the entrance to the living room, or to the place of labor. When a bee arrives at the door of her hive, she does not want to make a long, tiresome journey to reach the cell where her burden of honey is to be unloaded. Now, for this reason, the hive must not be too high or too long. But, besides this, the convenience of management requires that a hive shall not be too complicated. It should be such that all the internal arrangement may be laid open to view, when necessary, without much delay, or jar, or friction of parts so as to cause no unnecessary alarm among the community. Every part should be within easy reach, and so related to other parts, that changes that are necessary for the good of the stock, may readily be made.

CHEAPNESS is another prime quality. A very expensive hive is sure to be an unprofitable one. The more complicated the construction of the hive, the more expensive it must be. Still, there is no advantage gained in making a hive of poor material, because it is cheap; nor in hiring it made by a poor workman, because he will work cheaply. The hive should be well made, of good lumber, and well painted, to keep the weather from destroying it. In the Missouri Valley a good hive ought not to cost more than five dollars. In the east, where lumber is cheaper, it should not cost so much. A good hive will not have unnecessary openings through which the bee moth can enter, to lay its egg. For this reason it should have but one entrance, and that should not be too large.

A hive with a homestead the size described is sufficiently large to accommodate a swarm of bees, with plenty of room to store their supplies for winter. All honey deposited in the surplus honey boxes can be removed.

ARNOLD'S IMPROVED MOVABLE COMB HIVE.

PATENTED SEPTEMBER 21, 1872.

It is believed that this hive possesses all the qualities requisite to a good hive, in a larger degree than any other. Certainly those who have given it the longest trial, in competition with all other hives, have been the most enthusiastic in its praise. —

The following cuts show the character of Arnold's hive. The first cut presents nearly a front view of the hive as it appears open, with its movable frames edgewise to the observer. The second cut shows the hive closed, with the rear part of the floor dropped to facilitate the cleaning of the floor, and also showing the mode of hiving a new swarm. In the first cut the hood is shown on the hive; in the second cut it is left off, and the honey boxes are exposed to view.

DESCRIPTION.

The following description is taken from the Official Gazette of the United States Patent Office, of September 24th, 1872:

“The frames are based in niches cut in the sills at opposite inner sides of the outer case near the floor, and kept equidistant from

each other at the top by intermediate pins. A flat thin top to the case is slotted in coincidence with slots in the bottoms of honey-boxes resting thereon. A hood fits snugly over these boxes, and a flange from it de-

scends outside the case to cover the joint. The outer case is divided upon a line from near the top of the rear, where it is hinged, to near the bottom of the front, and an inclined piece fixed on the inner angle of each side of the top part presses the frames to-

ward each other in the act of closing. The case may be opened, carrying the hood and honey-boxes with the moving part, or these may be first removed."

ADVANTAGES.

I have been led to the construction of this hive, by my efforts to secure a combination of advantages with the least possible complication.

FIRST.—I wish a hive, every part of which is readily accessible ; so that either the purest honey comb, the brood chamber, or the bees themselves, may be reached and handled. If we wish to remove an old comb, and put another comb in its place ; if we wish to remove a full comb, and put an empty frame in its place ; if we wish to transfer a brood comb with its young brood, together with a queen cell and a quantity of bees, to a new location, it is of great advantage to have just such accessibility of the parts as this hive affords.

In my experience I have never found any other device that possessed this important feature—convenience—in so great a degree; and my neighbors, and many others who have made a trial of it, assure me that it more than meets their expectations. I have found that bees are addicted to the practice of waxing over every spot in the UPPER part of the hive, where joints are made by pieces of wood in contact. Thus, when movable comb frames are SUSPENDED from supports in the upper part of the hive, they are often so firmly fastened by the bees that it requires considerable exertion to get them out. Hence the comb is often bruised, or otherwise injured. Moreover, I have often wished to examine the different combs as the frames were suspended, but could not do it successfully, without removing one or more, BECAUSE they were FIXED at the top. I have, for these reasons, arranged my comb-frames so that they stand in semi-circular niches at the bottom, and when I wish to examine the

condition of a comb, I open the hive as seen in the first cut ; the frames can then be separated at the top sufficiently so that in a minute I can make a thorough search of the entire homestead. Now, suppose I suspect the presence of the moth ; by dropping the floor of the hive behind, I ascertain if they have made any litter thereon. Now, closing the bottom, and turning back the upper half of the hive upon its hinges, I can lay the combs open so as to observe them, one after another. If I deem it necessary to remove a frame, it is already loose, and I remove it without trouble. In all these operations I have not found it necessary to remove the hood, or to disturb the honey boxes. I replace the frame, or substitute an empty one, close the hive, and the entire process has occupied so brief a time that the bees have suffered the least possible annoyance. I have observed, that when I remove a honey box in which the bees are working, they immediately fill themselves with honey and leave,

but when I turn back the upper portion of my hive, without disturbing the honey boxes, the bees that are working therein remain quietly, and when the hive is closed, and the boxes are brought into their usual position, the bees resume their work as if nothing had happened. This I regard as a very great advantage.

SECONDLY.—I wish a hive that I can remove from place to place without difficulty, and without endangering the comb, or the bees. If my comb frames are suspended, as they usually are, they are free to swing. If the hive, in its removal, be not kept level, the suspended frames are liable to swing, and the comb is liable to be injured, and the bees to be killed. I avoid all this danger by the sockets in which the frames stand at the bottom, and the pins and wedges by which they are held in place at the top,

THIRDLY.—Whatever excellencies a hive may have, it must not be so expensive as to

eat up all the profits of bee keeping. Hence, many people still adhere to the old box hive. I find it possible to secure all the advantages of which I have spoken, at a reasonable cost. In the construction of my hive I use about sixteen feet of inch lumber, (or dressed $\frac{7}{8}$), which includes strips for frames. For honey boxes I use about five feet of thin lumber, such as is used for backs to pictures and mirrors, which is sufficient for four boxes. I use glass ends. I usually make two hives in a day, which is not a hard day's work. This does not include painting. Any one can estimate the cost of such a hive for his own locality, knowing the price of lumber and mechanic's labor.

I will sell a limited number of hives at \$4.50 apiece, to persons wishing to first test them before purchasing farm or territorial rights. On application, I will forward circulars, stating prices of territory, terms, ect.

Address, DON J. ARNOLD,
Brownville, Nebraska.

THE ITALIAN HONEY BEE.

Much interest has been taken in the efforts to introduce the Italian bee into this country, and considerable success has attended the effort, with excellent results. The Italian bee is undoubtedly stronger, more active, and more hardy, than the common bee. It is also a more successful gatherer of honey.

The Italian Queen is more prolific than the native Queen, and the swarms are accordingly stronger.

If any one shall get the Italian, thinking to have a more amiable bee, one that will not sting, etc., he will probably be disappointed. They are lively fellows in the maintenance of their rights, and they use the sting as violently as other bees.

CERTIFICATES.

The following certificates are from as reliable men as we have in this country, and who are successful bee-keepers :

BROWNVILLE, NEB., March 14th, 1874.

DON J. ARNOLD :

Dear Sir—I am delighted with the working of your Improved Movable-Comb Bee Hive. After proving it, I am convinced that it is all that can be desired in the shape of a hive.

HIRAM ALDERMAN.

BROWNVILLE, March 6th, 1874.

This is to certify that I have used several kinds of Bee Hives, and my preference is decidedly in favor of Arnold's, and I will rely upon it entirely in the future, as it gives much better satisfaction than any other I have tried.

S. COCHRAN.

ASPINWALL, NEB., March 9th, 1874.

D. J. ARNOLD :

Dear Sir—I am using the Arnold Bee Hive, and find it fills every requirement that

is necessary for a good hive ; and would also recommend every one who wants a bee hive for convenience, to try them and see for themselves.

Yours truly,
F. H. D. HUNT.

MISSOURI BOTTOM, March 14th, 1874.

DON J. ARNOLD :

Sir—I have kept bees for over thirty years, and during that time have tried from the hollow log gum to the Langstroth hive, but I find the Arnold Improved Movable-Comb Hive to be superior to any of them in convenience for handling bees or honey.

R. BUCKHAM.

PHELPS CITY, MO., February 20th, 1874.

I have been a bee keeper for thirty years, and have tried nearly all the patent hives that have been brought out, with variable success, and have come to the conclusion that Arnold's Hive has more good points for practical bee keeping than any other hive now in use.

Yours,

JAS. CARNES.

JOHN CRADDOCK.

W. F. CRADDOCK.

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BEE HIVE.

Patented September 24, 1872.

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