

ANTS ENTER THE BEEHIVE AND RETURN SO BLOATED  
WITH HONEY THAT THEY CAN HARDLY WALK

ONE would conclude, after a survey of most that has been written about the honey-bee, that he is endowed with extraordinary knowledge. Little or nothing has been said of his ignorance or stupidity; but I have come to the conclusion, after three years' most careful study of my bees, that in many instances they are far less intelligent than the average insect, both in guarding their stores and in protecting themselves.

My beehives are situated on a small piece of highly cultivated land, one hundred and fifty feet square. Across the street is a public park with plenty of forage from a large variety of trees, most of them bearing honey-producing blossoms.

Assuming that the average reader knows the main characteristics of the honey-bee—industry and regularity of building comb and making honey—it is unnecessary to touch upon these points, except in one or two instances. It may be worth while, however, to define some of the bee products: Wax is a natural secretion which is produced by bees as cattle produce fat—by eating. If the bees remain quietly clustered together when gorged with honey or any liquid sweet, the wax is secreted in the shape of delicate scales growing in four small pouches on each side of the abdomen of the worker bee. These scales are pulled from their bodies or drop off to the bottom of the hive and are then taken up, warmed and softened, and carried away for cell-building. Honey is pro-

duced from the nectar of plants and flowers, and during its sojourn in the honey-sack undergoes a chemical change due to the mixture with the saliva of the glands. This nectar contains in the flower from fifteen to ninety per cent. of water, and when the blossom is ready for fertilization the nectar is most abundant—generally in the early part of the day; at three in the afternoon flowers give the least nectar. Pollen, the fertilizing dust of flowers, is gathered by the bees from blossoms, carried on their legs, and placed in the cells for the nourishment of young bees. Propolis is used by the bees to coat the inside crevices of the hive to make it air-tight and water-tight. It is obtained from the resinous buds and limbs of trees.

It would be foolish to deny that honey-bees show many qualities of a high order of instinct, but they also show in a great many instances a remarkable degree of stupidity. Yet for centuries poets and writers have held them up as paragons of wisdom. Maurice Maeterlinck, in his most poetical description of the nuptial flight of the queen bee and the dramatic death of the favorite lover, is one instance. On the other hand, Sir John Lubbock, in his "Ants, Bees, and Wasps," dismisses the honey-bee with little ceremony, finding it infinitely less interesting and intelligent than the ant. There is no question that the ant at every turn outwits the bee in its home by stealing its hard-earned store. In fact, so numerous are the enemies of bees that it is no wonder

that they are supplied by nature with means to resist and even to attack the thieves who wish to take their earnings.

First comes the bee-moth, whose caterpillar bores through the comb; then the ant, the spider, and the wild bumblebee. The caterpillar of the bee-moth bores and destroys the comb; the spider kills the bees and sucks their blood; and the ant, the wild bumblebee, and various flies steal the honey. These enemies hover about and commit their depredations near the hive; and were it not for the extraordinary fecundity of the queen-mother, the bees' struggle for existence would soon cease. One would naturally conclude that so bold a creature would have the faculty of resisting its numerous small enemies, but, in fact, it is exactly the opposite. The bee seems paralyzed by a spider. Although its vision and scent are so keen that it cannot fail to see a spider busily working and weaving its web right in front of the mouth of the hive, yet one after another will fly right into the web, to sure death. One of the beekeeper's constant duties is to clear spiders away from the vicinity of the hive, especially from the entrance. In front of one of my hives there grew a Japanese iris. On this spiders would string their web, carrying it to the hive, so that one out of every twenty bees emerging and entering would be captured. In every instance where I have watched a bee entangled in the web its first and only object was to free itself. While it is struggling the spider winds it securely, and not till this is done does he use his nippers to draw blood; the struggle gets fainter; still the bee, equal or superior in size and strength, has opportunity to sting but does not, but simply makes all effort possible to get free.

The proper way to keep spiders away (and no doubt all professional beekeepers do it) would be to have the hives apart, in some open, isolated spot. Having them near the house, as I do, is a disadvantage both to the keeper and the bees, as the smell of honey attracts innumerable insects and vermin of all descriptions, creeping or flying. On warm summer afternoons the odor of

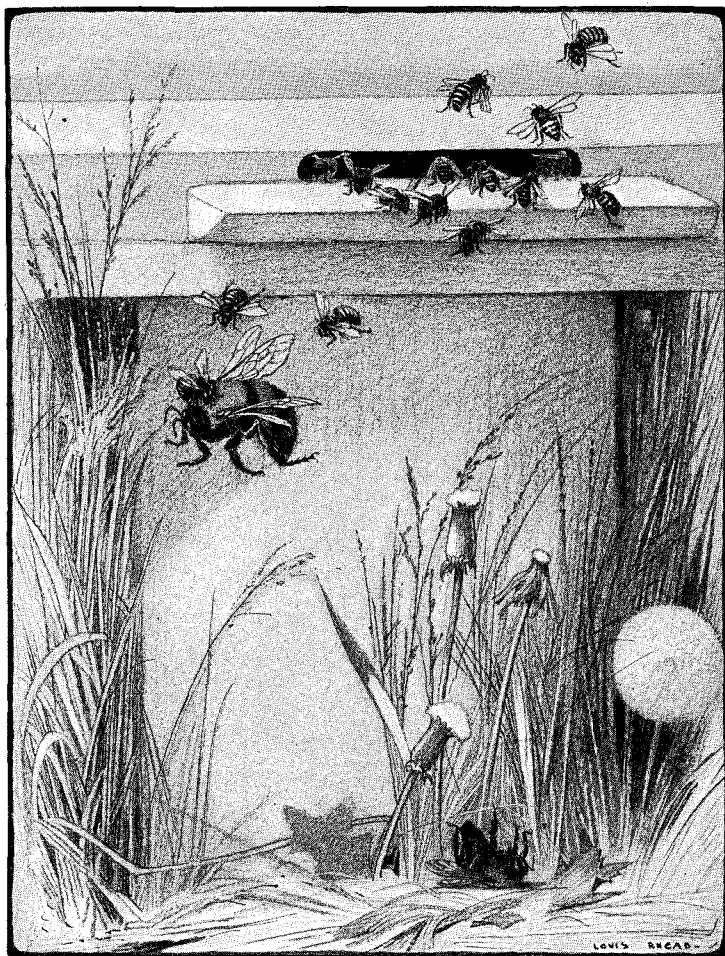
honey is so strong that fifty feet from the hives a person with ordinary olfactories can smell it. What must it be, then, with insects whose sense of smell is a thousand times greater? And ever since the bees have been located in my garden the insects have multiplied enormously. Common house-flies are more numerous, and so are many kinds of robber bees, wasps, hornets, and other flies. These also fall a prey to the spider, who is the most numerous of all on the flower beds, trees, and shrubs. A border of boxwood is a most wonderful sight; it is absolutely covered with webs woven most ingeniously; the hiding-hole is beautifully made in some of the small leaves, and the big web is spread out a foot and a half wide. Even at that distance—some fifteen feet from the hive—it is incredible how many bees are lost. No wonder that a wise provision of nature keeps the queen at home performing her duty of laying eggs (from three hundred to five hundred a day), for if she emerged often from the hive it would be hard to escape so many traps and snares.

With ants the case is different, because they invariably enter the hive, and, as they are unable to fly, the bee has the advantage in being able to pounce upon them and hold them down. Last winter a colony of ants made their way into the hive by boring through a crevice in the footboard, which was old and comparatively rotten. During the fall they bored passages in all directions, and there located their colony, and at intervals climbed up to the cells, stealing the honey and depositing it for future use. In midwinter the bees usually come out of the hives from time to time. But from this hive no bees appeared. I was somewhat surprised that four colonies came out of the hives and one did not. On lifting the top I found the combs covered with the entire colony, and every one stone dead—forty thousand bees motionless, their bodies shining as naturally as in life. I lifted the frames out to make an examination, and in so doing lifted the body of the hive from the footboard. This disclosed a large and numerous colony of ants in a semi-dormant condition, with a plentiful supply

of honey in their quarters. I came to the conclusion that the ants had stolen every particle of the bees' winter food, and the bees were consequently starved to death.

The question arises, "Why are not bees endowed with instinct to destroy so persistent an enemy?" They have

winter, they will issue forth. No matter if the snow is on the ground and the air is chilly; if only the sun shines, they will fly around. I have seen them on these occasions fly for a few moments and then drop helplessly on the snow, and after a time, for a space of a few yards around the hive, they lie so



THE BEES DART OUT AND SAVAGELY STING THE BUMBLEBEE, WHO SOON FALLS DEAD IN THE GRASS

the same sense of smell and the same sense of sight as the ant, yet in this instance probably months of depredations on their hard-earned stores went serenely on without any effort to stop it. The average number of bees in a healthy hive is about sixty thousand, yet I venture to believe that eighty per cent. in one year come to an untimely end.

Again, on bright days during the

thick that the snow is hidden. On these occasions the beekeeper will often lose from fifty to one hundred thousand bees. The question may well be asked, "Why does the bee not know, not have instinct enough to know, that the temperature is lower than he can bear?" Some beekeepers say they would die anyway; but that is no reason, for in summer they fan to keep cool, and in winter fan to



keep warm, and they would succeed in weathering the winter's cold if they kept in their hive.

In the summer, particularly in June, enemies of bees are most numerous. By day and by night constant vigilance is required, so that guards are stationed at regular intervals to stop any depredations that may occur. In the daytime bumblebees of various sizes persistently try to force an entrance. A big bumblebee, many times too large to get through the entrance, smells the honeyed store, flies slowly around, and alights on the footboard; but in a second the guards go for him and strike from above, holding tight till his struggles are over. Then, stung to death, he rolls over on the ground. Almost every day I find numerous dead bumblebees on the ground, paying the penalty for attempted robbery. Large bluebottle flies play the same game with precisely the same results; but an ant, a much smaller creature, manages to get in and come out with his body so bloated with honey that he can hardly walk. This must have happened countless times, and one would think that the bee, capable of stinging the ant to death, would do so. In a combat there is no doubt that the bee would be victorious.

At night many insects may be seen hovering around, and although the bees' nightly vision is limited, they place themselves so thickly before the entrance that it is impossible for any marauders to enter. Nevertheless, ants choose night-time mostly for their work, and they nimbly run between the guards, to return later gorged with honey. How it is done is a mystery to me, for every cell that contains honey unsealed is covered by the bees. I think it very likely that the ant gnaws through the thin covering of the cells. These depredations also go on during the daytime.

I have for some time observed within a short distance of the hives the well-marked tracks of rats. We have never read or heard that rats disturbed bees. Mice have been repeatedly found in the hives during the winter months, but it is assumed to be for warmth rather than for stealing honey. I have seen a large rat come out and take away the

stones of apricots dropped from the trees in front of the hive. Whether the rat had endeavored to enter the hive or not I am not sure; but one day I found a rat lying dead in front of one of the hives. On picking him up and making an examination I found he had been stung in nine different places; he had one eye closed, and the barb of the sting was still fast in the eyelid. Again, I had a young dog on the place, and he has been repeatedly stung at various distances from the hive. This to a certain extent proves that bees often attack those who do not interfere with them and do not always attack those who do.

Another instance may be mentioned of what I call bee stupidity. I had about a pint of sour honey which had run from unsealed combs, and placed it in a flat plate before the hives for the bees to remake. In ten minutes the first bee got on the plate, took a few sips and left. Shortly after others followed. In the space of twenty minutes I counted eighteen ants and nine flies—two of the large bluebottle variety, the remainder being different kinds of small wasps—and forty hive-bees. I had been careful to place small chips of wood for the bees to alight on while floating in the sticky mass, yet every one of the forty bees floundered in up to their eyes in the liquid sweet. On removing three of the live ones to the edge of the plate they promptly struggled back, refusing the opportunity to crawl through the grass to clear their bodies and get their wings dry to enable them to carry the honey to the hive. On the other hand, the flies and ants carefully stood on the edge of the honey—the ants in a perfect row, equally distant from each other, with not even their feet soiled; but when gorged to the limit of safety, away they would go and soon return for a fresh supply. I returned indoors to resume my work. Two hours later I went to examine. To my great astonishment, the plate was absolutely clean. Not a speck of honey was on it, and the bees I had imagined drowned had disappeared. Subsequent experiences proved that during my absence other bees visited the plate, and not only collected the honey but cleaned every particle of honey from the bodies

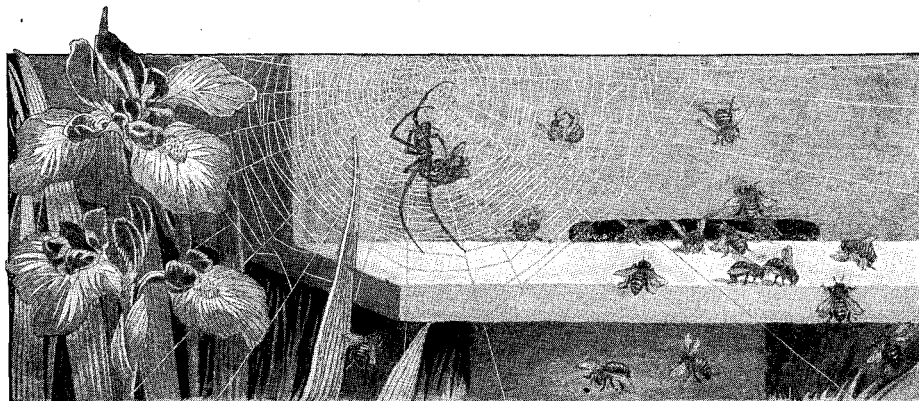
of those who had voluntarily taken a honey bath. It might be imagined that these forty bees would have sufficient intelligence to know that they could make in that time at least twenty-five trips to the hive, only two feet away. Of course we might also assume that the other bees were mighty smart to get them out of the mess. Not so, however. They would have cleaned the liquid sweet from a piece of stick just the same. They were not intent on saving the lives of their comrades, but simply were after the honey on their coats.

The oft-repeated praise of the tender solicitude of the nurse and doctor bees seems in striking contrast with the callous movements of healthy bees who pass by their dead or wounded sisters without the slightest notice, but will quickly remove them if work is impeded, taking no end of trouble to pick the body up, fly some distance, and then drop it. A single bee may be seen tugging and pulling, the rest working merrily on, taking no notice whatever nor giving assistance; yet in the hive comb-building every one helps his neighbor in building a cell. The same thing applies to a bee struggling in a spider's web. The strength of a union of twelve bees flying with savage force against the fragile web would at once set a prisoner free; yet, while they are indifferent to their comrades' trouble, if a young terrier pup ventures within a yard or so of the hive a dozen bees are on him like a flash, and with unerring judgment they know his tender spots.

It often happens that people around

the place, with whom the bees must be familiar (and this is especially so with the beekeeper, who works around them every day), must arm themselves with a smoker; for the honey-bee is no more under the will of man than he was thousands of years ago. After centuries of so-called domestication bees are just as intractable, as vicious, and as suspicious as formerly, and this toward their masters as well as toward strangers: With all the care and attention bestowed on them, they will, under certain conditions and at certain times, sting any one who disturbs or goes near their hive. I know beekeepers who use neither veil, gloves, nor smoker; but they are imperious, having been stung so often that the pain is little worse than a mosquito-bite. Yet to sting is in nearly all cases sure death to the bee, for the reason that the sting, being shaped like a barbed arrow, cannot be extracted from the wound. If a bee manages to tear itself away, it leaves parts of its body, and of necessity soon perishes. Wasps and hornets are different from bees in this respect, for they can sting repeatedly without endangering their lives.

Many minor things might be mentioned to show that the honey-bee is not only stupid, but more so than the average insect with which it comes in contact, although it is admittedly a wonderful creature in many ways. If it were not for its sweet and toothsome honey, we should have no more respect and affection for it than for the common hornet.



THEY MAKE NO EFFORT TO DEFEND THEMSELVES, BUT STRUGGLE TO BE FREE FROM THE WEB

## Science and a Future Life<sup>1</sup>

UNDER this title Professor Hyslop exhibits the light which, in his opinion, scientifically conducted psychical research has cast upon the question whether there is a future life. This question he and some of his companions in this investigation were once disposed to answer negatively. They now declare themselves converted to the affirmative by their conviction that they have obtained from deceased friends convincing evidence of their continued existence. Since the days of the Witch of Endor similar statements have been made by any number of people, especially spiritualists, so called. The significance of the present statement is that it is made in the name of science by one who stakes his reputation as a scientific investigator upon the strictly scientific character of his processes and his conclusion. These, as here stated, are virtually a challenge to the scientific world, professional and amateur, to find a flaw in his processes or a fault in his conclusion.

This conclusion, however, is not categorically but hypothetically put. It is maintained merely that the continued existence in an unseen world of persons who have ceased to exist in this world, with ability to communicate with surviving mortals, is entitled to rank as one of the various hypotheses which science may adopt for the explanation of phenomena that can only hypothetically be explained—a familiar instance of which is the explanation of the phenomena of light by the hypothesis of a cosmic ether.

Wide and deep skepticism toward such a conclusion, and aversion toward the researches that tend to it, have been justly provoked by the incompetence, charlatanry, and imposture that have often befooled the subject, and made the judicious laugh or grieve. Mental infatuation is imputed by not a few to any who delve further in a field so discredited. Well aware of this, Professor Hyslop confidently faces this disadvantage. Since ancient times extraordinary

phenomena have occurred which have been widely regarded as indicative of occult powers “deep seated in our mystic frame.” Scientific skeptics have recently employed exceptionally good opportunities for a most rigorous investigation of these phenomena. Professor Hyslop’s book is his record of these investigations, together with a critical appraisal of various proposed explanations of the phenomena. There are but two hypotheses which Professor Hyslop regards as worthy of more than the briefest consideration. Fraud, lucky guessing, chance coincidences, he regards as out of the range of rational possibility. The two alternatives between which he thinks that choice may waver are telepathy of such range and selective power as to be well-nigh omnipresent if not omniscient, and the activity of intelligent beings formerly on earth. Each of these is criticised at length and in various points of view, and the preference is given to the latter as the more rational explanation. This, however, is admitted to be open to serious objections, arising especially from the triviality, the confused and the scrappy nature of a large part of the alleged communications. These objections Professor Hyslop meets with solutions which may well claim at least serious consideration by the student of these phenomena.

It must be said that no attempted refutation of these solutions can succeed which does not cut loose from the *a priori* mode of argument still in vogue on this subject. Theologians do not now, as formerly, deduce the infallibility of the entire Bible from an *a priori* postulate of what might be expected of such a being as God. But people still postulate what sort of communications, if any, might be expected from departed spirits in—let us say—heaven, or a more perfect life than ours. Whatever alleged communication conflicts with this ideal they consequently discredit. Against this method Professor Hyslop contends for a strictly inductive treatment of facts at whatever cost to preconceptions.

We have here attempted nothing more

<sup>1</sup> *Science and a Future Life.* By James H. Hyslop, Ph.D., LL.D. Robert B. Turner & Co., Boston.