THE WONDERS OF THE BEEHIVE.

The following is the substance of a lecture delivered by Mr. F. R. Cheshire, F. S. A., under the auspices of the Devon and Exeter Beekeepers' Association: Mr. Cheshire said, by way of introduction, that a good many people had taken up bee-keeping, believing, from books which they had read, that they would reap large profits without understanding the economy of bee-life. He would treat of the economy of bee-life, and let them know its right basis. It is not merely by purchasing a hive and leaving it to itself that great profits were to be made. If they stood before a hive at the time the bees were gathering, they would notice numbers of bees going in and out, and that those which went in had large pellets on their hind legs. Old writers believed that these pellets were wax, but they were really pollen. If they could watch the bee as it entered the hive, they would find that it ran up one of the combs which hung from the roof of the hive. Could they watch it further, they would find that the bee would settle on one of the cells, and thrust off the pollen into it. In all probability the bee would turn round and butt the pollen down with its head, but that was not all the bee would do. Whilst it had been gathering this pollen with its legs, it had, at the same time, been gathering up with its tongue the honey secreted in the hollows of flowers. This honey had been taken in and deposited in a somewhat capacious sack, or false stomach. If it had been necessary that the bee should eat honey for food that passed into the body, while that which was gathered for depositing in the cells went into the honey-sack, they might ask why it was that the bee went forth to gather pollen on the one hand and honey on the other; and another interesting question was, Why did the flowers present both honey and pollen? Well, one question could be answered in the hive, but they must go into the fields to get the answer to the other. He would first answer the question why the bee gathered both honey and pollen. If they removed the comb from the hive at this time they would find in it numerous eggs and grubs. Those who had studied the etymology of insects knew that they passed through four conditions: first, the egg, then the grub, in which state it ate largely; then the pupæ; and lastly, the perfect insect. The bee passed through all these changes. The egg was deposited at the bottom of a cell by the queen, and the cell was immediately covered over. The germs of the egg developed, and in three or four days it became a grub; the end of the egg was broken and the grub issued. There it lay in a very imperfect condition, and as it was incapable of movement its food had to be brought to it. This was done by the younger bees, who took upon themselves the duties of nurses. These nursemaids, who fed the grubs, took in pollen, honey and water. It was out of this pollen that the body of the grub was built up. It had undergone digestion in the body of the nurse and was ejected on to the bottom of the cell. Now the grub had a very imperfect mouth, but it had the quality of taking in food by the pores of its skin. It laid on one side and took in the food, while the upper side provided it with air. At the end of six days it was a good well-formed grub, and then passed into the third condition and began to spin a web, with which it covered its body. A series of marvellous changes then took place; the grub became more and more perfect. These changes went on for twelve days, and at the end of that time, the grub became converted into a bee, and cut its way out of the cell. The queen bees were wonderful layers. From 2,000 to 3,000 eggs were laid by the queen, in the height of the season, in 24 hours, and in from 20 to 21 days these eggs were converted into bees. Having referred to the wondrous change of the bee-grub, he would next proceed to speak of the formation of the eye. Now, there were certain relations of the bee to the flowers, and the flowers bore certain relations to the bee. The eyes, as they were called, of the bee, were situated on the sides of the head, but each such "eye" consisted of 4,000 single eyes welded together, and, from mutual pressure, it was hexagonal. Each eye was in an independent position, and each had three lenses, like the eye of a human being. These three lenses gave perfect vision, and the two first lenses were achromatic. The bee had also three single eyes on the top of its head, and the sight of these was short, and enabled it to see whilst it was feeding. Next, to the tongue. Honey was so susceptible to water that, if exposed as in the flowers, it would get washed away. But, in the majority of flowers, it was secreted deep down in the bloom, and that being so, it was necessary that the bee should have a long tongue to reach it. The queen bee, which remained at home, did not gather honey, and could not do so, for she had a short tongue and so had the drones. The tongue of the working bee had a singular, hand-like appendage at the end, which enabled it to gather the most minute particles of honey from the recesses of flowers, and where there were large quantities, it had a means of lapping it up, and gathering it into its basket. Next as to the legs. It would be found that neither the queen bee nor the drones had the arrangements on their legs for gathering pollen. The working bees, when they went to the flowers, gathered this pollen on their bodies, and worked it off into the receptacles on their hind-legs. The wings were four in number; why was that? As they knew, the bees were produced in small cells, and if the wings were only two in number, and were large enough to support the bee in his flight, it would not be able to enter the cells. These double wings lapped over each other, but during the flight of the bee were united by a number of hooks, and acted as one. Proceeding to speak of the work done by the bees for flowers, the lecturer pointed out that it was necessary for the fertilisation of the seed of plants that the pollen of other plants of the same order should be transmitted to them. This work, in common with other insects, was done by the bee. The plant, as it were, baited its flower with honey, which the bees went to get, and in so doing took the pollen from the flower. The lecturer first took two varieties of the common primrose, and showed how the bee, in gathering the honey from one, gathered on its body the pollen, which in turn, whilst the insect was collecting the honey from another variety, came in contact with and fertilised seed. Having shown how the pollen served to build up the grub and assist in the fertilisation of flowers, the lecturer proceeded to treat of honey, which, he pointed out, was a great producer of heat. A great deal of nonsense, he said, had been talked of late about thin hives for the winter, but he assured his audience that if they allowed heat to escape from the hive they also allowed honey to escape. Honey was a great heat-producer, and the more heat was allowed to escape, the more honey would be eaten by the bees. In allowing heat to escape, they not only lost honey, but they gave the bees an immense amount of work, which wore them out before the time came for them to commence the labour of collecting honey. He had made experiments, with a view of testing this question of the merits of thick and thin hives, and he urged them not to be led away by dealers to believe that thin hives were the best. Honey was the producer of the heat necessary for the bees, and if they allowed the heat to depart from the hive, they not only lost more honey, but they also wore out their bees. A great deal of nonsense had been talked about bees, and amongst other things it was said that they broke the skin of fruit; but the bee had not the jaw for this, though, when once the skin was broken, the bee would suck the saccharine matter in fruit if it could get nothing else. But the bee had something to do with fruit before this. The raspberry and gooseberry were fertilised by the bee in the same way as flowers, The work of selection and hybridisation had been carried on by the bee, and man was just following on in the work. He had said that a cottager might make £3 a year by a hive, and that had been questioned in a letter by some one who did not give his name. He was not accustomed to make statements he could not substantiate, and he preferred not to deal with anonymous correspondents. But they knew what a wretched season the last had been, and he might mention that he last year bought a hive for £1 1s., from which, by proper treatment and feeding, he had £5 worth of honey. It was a mistake to believe that in giving bees sugar they were throwing away money. If bees were not fed, the hive was kept thin, and the result was that when the honey season came they began to breed, and a large number that should be out had to stay at home to keep up the temperature and attend to the hive. On the other hand, if they fed the bees, they would have a strong army ready to gather honey at the right season; and it must be borne in mind that sugar could be had for 2½d. per lb., whilst honey was worth 1s. per lb. In conclusion, he explained, by means of models, various improvements in the arrangements of hives, and expressed a hope that he had done something to induce his audience to go in for modern bee-keeping.

—The salt bed at Petrolia lately announced has proved so great that a wealthy company has been formed, and a shaft twelve feet square is sinking, designed to reach the bed. Several hundred feet of solid rock must be gone through before reaching this sea of salt, and it is thought that it will take a year to complete the work. The venture is considered first-class.

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