

warm pleasant day. It may as well be confessed that we know very little about this remarkable instinct of the bee. In the first place, under ordinary conditions, the old queen would not allow queen-cells to be constructed in her colony, nor has any one told us why she allows it now. Neither do we know what starts the actual swarming, nor which bees, workers or queen, first set the hive in motion. We are equally ignorant of what is the thing which compels certain bees to leave with the old queen and why the others stay in the old hive with the young queen. Since the prevention or control of swarming is such an important problem in practical apiculture, the value of research along this line is evident. Since our original hive has now divided, let us follow the swarm with the old queen and later return to the old hive to observe the actions of that.

In the hands of a bee-keeper the departing swarm may be put into another hive, provided he wishes to increase the number of his colonies; but in Nature the swarm will find an old hollow tree or some similar place in which to establish itself. The bees, before leaving their old hive, fill themselves with honey until the abdomen is greatly distended, and for this reason it is not necessary for them to collect nectar for a day or two, for they have other work to do. Some of the bees begin to clean up the new quarters and get it fit for occupancy; but most of them begin the construction of new combs. To do this they suspend themselves in curtains from the top of the hive, and remain motionless for some time. The wax used in building comb is secreted by the workers in eight small pockets on the lower side of the abdomen while they thus hang in curtains. Finally, after considerable wax has been thus formed, they begin to build. The small flakes of wax are passed forward to the mouth, there mixed with a salivary secretion to make them pliable, and then are placed against the top of the hive. Other workers then come and place their small con-

tributions of wax on those first deposited, and this continues until the combs are finished. There is more to comb-building than the mere sticking on of wax plates, however; and nothing in all bee habits is more wonderful than the beautiful plan on which they build the comb. The cells are hexagonal in shape, so that each cell in the centre of the comb is surrounded by six others; nor is this the only remarkable thing in their architecture, for each comb is composed of a double row of cells, the base of each cell being formed of three parts, each one of which is likewise a part of a separate cell on the other side of the comb. By this method the bees obtain the greatest possible capacity for their cells with the least expenditure of wax. The accuracy of the cells of the comb has in all ages been an object of admiration of naturalists and bee-keepers; and while the degree of perfection assigned to these cells has undoubtedly been overstated by most writers, yet we cannot but admire and wonder at the remarkable instinct, almost bordering on intelligence, which enables the bees to build cells so well suited to their purpose.

As soon as there are some cells constructed, and even before they are entirely completed, the queen begins to lay eggs, and the workers begin to collect stores of honey and pollen. They also collect in considerable quantity a wax-like substance from various trees, commonly called propolis, with which the inside of the hive is made tight, closing up all openings except the one which serves as an entrance. In this way the new swarm prepares for itself an abode like the one it left; and by sealing up the crevices and gathering stores it prepares for the coming winter.

We may now return to the colony which remained after the swarming took place to see what happens there. The colony left in the old hive retains all the brood and honey stores and has a newly hatched queen. There is then no necessity for wax building nor for sealing up the hive; but this colony is already in a nor-

mal condition, and is not yet ready to receive a very young queen from the worker combs practically about five days (depending on the season, the virgin queen to mate with a several short, before her hive located on her return, and in constantly enlarging the air. Thus far followed; but few enough to observe. Sometimes the matter comes to a lower point, and a fact of witness the mating flight. In the hive, in some many drones to her apiary, provided her bee yard, and the is successful in the often follow the queen and for an hour or outside of the hive but later they return. The queen returns in about half an hour with her general, which is killed the two. Near the queen is a small sac filled with fluid, is filled with after her return this opaque fluid; and it is a opaque substance thing in mating. millions of spermatozoa each one of which is an egg as it glides past. This supply of most always sufficient by a queen for the rarely happening second time before a queen can, during the