

tery caused by the uneven temperature. If your cellar had been kept at a right degree of temperature in all probability no dysentery would have appeared. The sudden rise and fall of temperature caused the uneasiness among the bees and caused them to gorge themselves with honey; then when it became cooler in the hive the moisture would condense among the combs, thinning down the honey. The brooding perhaps had something to do with the trouble. If they had no pollen they could not have raised brood and in all probability would not have had the dysentery so badly. At the time you first examined them it is quite likely that the disease had gone *too far* to be remedied. We hope the remainder of your bees came out safely. We think tan-bark alone would be excellent. No grass could get through it.

APICULTURE.

BY ALLEN PRINGLE.

(CONTINUED FROM LAST WEEK.)

A properly constituted colony of bees consist of three different kinds, viz.:—an impregnated *queen* (the fully developed female); *drones* (the males); and *workers* (undeveloped females). The queen (absurdly called the "king-bee" from the time of Aristotle and even Virgil down to Huber) is the mother of the whole colony, and is capable of laying over three thousand eggs per day! During the height of the breeding season in the honey-flow, she frequently lays from two to three thousand eggs per day for many consecutive days together. She remains prolific for from two to four years, and in some instances queens have been known to remain prolific upward of five years. Before the queen-bee of a colony becomes quite barren, and while she is still laying, if not removed by the apiarist, the workers themselves supersede her, by killing her and rearing a young queen to take her place. Sometimes, however, the old, worn-out mother is permitted to remain in the hive while the young one is being reared, and ultimately dies of neglect and depression, or is assisted to "shuffle off" by her own unfilial progeny. The queen is reared from the same egg as the worker, but in a much larger cell, nearly perpendicular, and on

different food, called "royal jelly," which has the effect of fully developing the sexual apparatus. The time from the egg to the perfect queen emerged from the cell is about sixteen days. In a few days after hatching, the young queen leaves the hive for her "bridal flight," during which, and on the wing, she meets the male bee or drone in copulation and becomes impregnated, when she returns to the hive to remain there until she leads out the first swarm, which she does when she finds young queens being reared in the hive—one of them being designed to take her place. A *single* fertile queen in a colony is the normal condition of the household, and hence the old queen departs to make room for her successor. Second and third swarms are of course led out by the young queens. With the exception of sometimes attacking and destroying inchoate queens, the sole function of the queen is to deposit eggs and lead out the first swarm. After her impregnation she deposits both drone and worker eggs—either kind at pleasure. She is capable, however, as a virgin queen, of laying fertile drone, but not worker, eggs. This apparently anomalous fact (*parthenogenesis*) is now well established, but not only in the case of the virgin queen-bee, but in that of several other insects. Sometimes *worker*-bees in queenless colonies lay fertile drone-eggs; but the queen is the only fully developed female in the colony.

The worker-bees, though "the bone and sinew" of the hive, are not blessed with the queen's longevity. In active work, on the wing and the hive, during the honey season, they naturally live but a few weeks—from one to two months—while those hatched in the fall will live until spring, sometimes reaching the age of nine months and upward, which is the maximum longevity of the worker-bee. In passing from the egg to the perfect bee, the worker occupies twenty-one days. The young worker spends several days (from ten to fifteen) at home building comb, attending to the young brood, receiving and depositing the loads of the outside workers, and sundry other little duties, before it ventures to the fields to work. The duties of the older workers of the colony are to gather honey, pollen, and propolis, destroy and cast out the drones when necessary, and defend the colony from enemies without or within. They also, as already noticed, destroy old, unprolific queens and rear young ones to take their places, and sometimes lead out in swarming, as the queen does not always take the lead in swarming. And although very young bees are ordinarily very reluctant to leave the hive, I have seen such rush out under the swarming impulse so young that they could not fly more than a foot or two, if at all. They usually crawl back home again in apparent disgust with the outside world, and