

site streams of migration have differed during thousands of years of separation.

Supposing also that the social bees have, as is only in accordance with the laws of evolution, sprung from the solitary bees, we must admit, I think, that this development must have been complete before the great western migration began; for had this not been the case, it is scarcely likely that there would have been so great a similarity in the result, as I shall point out in the course of this paper. Yet, again, there must have been some land connexion, or else some great change of habit common to all the varieties—which is contrary to the supposition above—seeing that it would be impossible for a swarm headed by its queen to cross so large a stretch of water as the Mozambique Channel, or perhaps even the English Channel, or, if not impossible, yet contrary to all present habits; and yet a single queen, or a queen followed by one or two neuters only, cannot raise a colony. Thus we see that there is no small geographical and scientific interest in the subject before us.

Apis unicolor differs but little in appearance from *Apis mellifica*, so slightly in fact that one is surprised; many of the European varieties differing much more from each other, as also some African varieties. *Apis unicolor* is darker, smaller, and less hardy, with less decided rings on the abdomen. The drones are likewise identical. In both the queens have reddish brown legs, whereas the workers have black legs; the queen of *Apis unicolor* perhaps having redder legs than that of the European variety, and in general appearance the latter more closely resembles the worker. The queen of the Malagasy bee has a most beautiful bluish-black sheen over its abdomen, and the hair on the thorax is lighter than that on the neuter. Both varieties have the peculiarity of a curved sting in the queens, and a straight sting in the workers. We thus see how true the bee has kept through countless generations and under vastly different circumstances. No other domestic animal has varied so little or thrown so few sports, for there are only twelve species of *Apis* known, and with but few varieties, differing slightly in coloring and habits. This, no doubt, is due in a great measure to the difficulty of artificial selection, yet *Apis* is emphatically an in-breeder, brother and sister almost invariably pairing when in their native haunts; so that varieties, or even malformations, might have been expected to a much larger extent than is the case.

In a country, too, as regards its fauna as Madagascar, we might have easily expected some more decided type of *Apis*, or none at all—as is

the case in Australia—but such we see is not the case; in appearance and in habits, too, there is a great resemblance. They choose the same situation for their hives if left to nature. They multiply in the same way, by the old queen leading the first swarm, and the young ones the casts.* This last fact is important where the geographical distribution is concerned, for an old queen is generally heavy with eggs, and in any case is not accustomed to fly far, certainly not across the sea; whereas the young, active queens who lead the casts are still unfertilized, and must be in the proximity of the drones after a site has been found, for not only workers but also drones must follow in her wake. Then again the drones are idle and are killed off at certain seasons. Fertile workers appear if the hive is queenless, but, as in England, they only produce drones. They gather the same food in the same manner. Even in the minutæ of habits they are the same. They hum if excited, and when ventilating their hives. They only gather one species of flower at one flight, a habit among the solitary bees as well. Even their enemies are the same, the wax-moth, the *Sphinx atropæ* (death's-head moth), and the rat. Some of the diseases I have not found, but possibly these are products of a higher state of domesticity. Their very behavior when robbed or queenless is the same. Both will raise queens from the worker eggs on an emergency, and in precisely similar a manner, by enlarging the worker cells and altering the food; both diminish the entrance if harassed, and cling in clusters for warmth and for wax-making.

Yet there are many slight differences. Drones seem to be bred with much more regularity by the English bee. There is one great breeding season, and another small one later on; whereas the Malagasy bee seems to breed drones on and off all the year round. There is seldom a month in the year, summer or winter, when drone brood can not be found. Then, again, the English bees kill their drones off in autumn, the massacre perhaps lasting a day, and not a single drone being left, except in the case of a queenless hive; but the Malagasy bees, though they kill them off to a large extent when food begins to run short in autumn, yet they seem always to leave a few even in the most prolific colonies—in fact, the greatest number was left in the hive that had the most fertile queen among mine last year.

* A "cast" is a swarm led by a newly-hatched or virgin queen. The first swarm is led by the mother queen; all others that follow from the same hive are "casts."