

got on without her, she has no power over the bees. Still, they miss her, directly she is removed or dies, and becoming disturbed, search for her everywhere, and immediately make preparations to bring up another queen in her stead. This happens often in summer, when the queen becomes old or impotent.

6. ONLY ONE QUEEN TO EACH HIVE.—There is never more than one queen in each hive, and the strongest hatred reigns between two of them, even in captivity. Thus, if you put two under a glass, they will attack each other directly; and one of them, after a few rapid movements, will seize the other by the wing and kill her (1).

7. THE WORKING BEES.—The most numerous are the workers. All the labour of the hive devolves upon them. Small as they are, only measuring from 4 lines to half an inch it is they who gather the honey and secrete the wax, who feed the young, and oppose the enemies of the colony. During the hot weather, they ventilate the hive by causing a current of air to pass through it from the frequent motion of their wings. They have a *proboscis* (fig. 2) which serves them to draw up honey and water, and a *sting* composed of a sheath and two barbs (fig. 3) (2). Their hind legs are furnished with pollen-baskets, by means of which they retain the pollen of the flowers in the shape of small pellets, and their forelegs have little hooks by which they cling to one another (fig. 4).

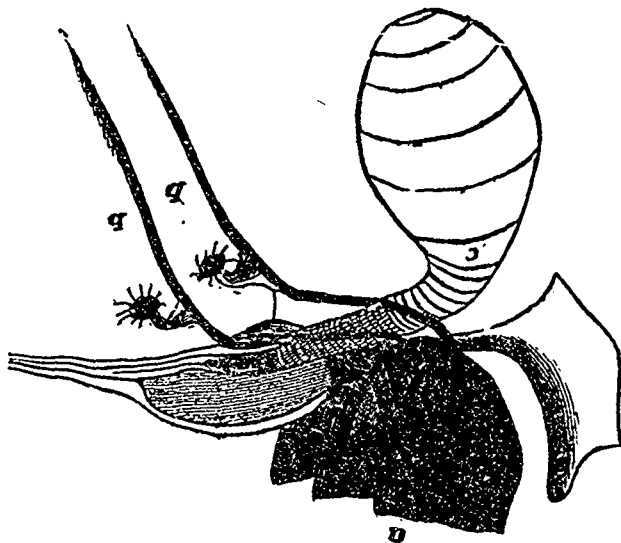


Fig. 3. Sting (mag.)

8. THEIR LENGTH OF LIFE.—Only 6 or 8 weeks do they live during the summer; but, in winter their time is prolonged to 7 or 8 months. The prodigious laying power of the queen renders this difficult to see; but if, in summer, you introduce an Italian queen into a hive, in six or eight weeks afterwards the colony will, on inspection consist only of Italian bees, easily distinguishable by their pretty gold stripes.

9. THE DRONES.—These are the male bees, and their only duty is to celebrate the rites of Hymen with the queen. They are never visible except from June to September, and their presence as well as their number depends upon the state of the colony. They are big, with a round head, and without a sting: hence, when the bees do not want them any more, they can easily get rid of them (3).

10. THEIR USEFULNESS AND THEIR LIFE.—One drone in a thousand is enough to fertilize the queen—the unfortunate one dies immediately afterwards. The bee-keeper should have as few drones as possible in each hive, as they are great consumers, and collect no honey. Their life is precarious, and much shorter than the life of the workers. They are put to death mercilessly, whenever a scarcity of honey occurs, and they are invariably



Fig. 4. Fore-leg of worker.

killed in autumn in every well conducted family of bees.

- (1) —nam sæpe duobus  
Regibus inessit magno discordia motu.
- (2) Spiculaque exacuunt rostris.
- (3) —Aut agmine facto  
Ignavum fucos pecus a præsepibus arcent.  
Immunitque sedens aliena ad pabula fucos.

What the Bees produce.

11. HONEY, POLLEN, PROPOLIS AND WAX.—Their principal business is to collect honey, but they take a great deal of water into their honey bag, particularly in the great heat of the queen's laying.

Often they may be seen entering the hive with their hind legs loaded with a green or yellow substance: this is the *pollen* of flowers, and is used to feed the young grubs.

Instead of pollen, they are sometimes laden with a shining, sticky matter, which they have some trouble to rid themselves of: this is *propolis*, a sort of resinous gum which serves to close up any cracks in the hive, and is sometimes used to enclose in a safe prison any strange substance too heavy to be expelled from the hive (1).

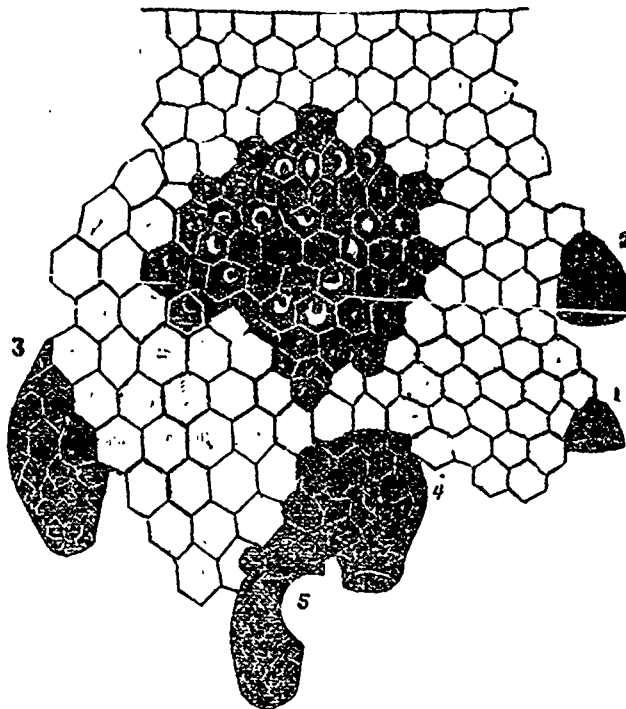


Fig. 6. Cells.

They secrete wax between the segments of the abdomen (fig. 5), in the form of polygons or thin sheets, after having absorbed a certain amount of honey. American authors agree in saying that it takes from 13 lbs to 20 lbs of honey to make 1 lb of wax.

The physiology of Bees.

12. CELLS.—Every hive is furnished with combs attached to its top and sides. These combs are parallel, and are composed of a double row of cells of three sorts (fig. 6): those of the workers, those of the drones, and the cells destined to produce the future queens. These last are in position, vertical, and, in shape, like an acorn, while the two first are horizontal. The working Bees' cells go 25 to the square inch, the drones' cells 16.



Fig. 5. Bee secreting wax.

13. HOW THE BEES ARE PRODUCED.—The queen-bee, before laying looks into the cell to see if it be clean, lowers her abdomen into it, and drops there a tiny egg just visible to the naked eye. She can lay as many as four eggs a minute. Three days after, a white *grub* issues from the egg, which is fed for six days economically by the bees with a mixture of honey and pollen. After the eiape of this time, the cell is closed by the nurse-bees, and the grub having attain-

- (1) —Pars intra sæpta domorum  
Narcissi lacrimam et lentum de cortice *gluten*  
Prima favis ponunt fundamenta, deinde tenaces  
Suspendunt ceras.