

but the slightest pressure on the helm to change the direction of the vessel and to respond to every demand that I made upon it.

"I also profited by the lesson I learned on the first flight, and when I found that the motor was working smoothly and evenly, furnishing all the power necessary for a successful demonstration, I let well enough alone and did not attempt to increase the sparking, which action caused the motor to "go dead" on my trial last Tuesday.

"The mechanical part of the airship worked perfectly. The motor did not miss an ignition, and the revolutions of the propeller were steady and powerful. I am not sufficiently experi-

enced to estimate the speed at which I moved, and any way, I was too busy most of the time to make any calculations."

"Captain Baldwin was extremely optimistic regarding the future of his airship.

"I had about determined to leave St. Louis," he said, "but now I will not be content to leave before I have had several trials for that \$100,000 prize.

"Knabenshue went up with instructions not to go far from the aeronautic concourse, and to bring the ship to the ground after a trial of half an hour. He came within two minutes of obeying my instructions to the letter. We will give daily exhibitions, of varying lengths, to convince the people of the world that I am right."

## The Intelligence of the Bee

In point of mental development the bee stands high. "Neither in its instincts nor in general intelligence can any fish be compared with an ant or bee," says Romanes. The ant is, on the whole, superior in intelligence to the bee, but in some respects it is the bee's inferior. The bee has a well developed faculty for communication. It not only recognizes its fellows but distinguishes between men. It has a government and practices division of labor. It carries on wars. It is the most skillful of architects. The aptitude with which, in diverse circumstances, bees adapt means to ends, makes it impossible for any one who has closely observed them to doubt that they are guided by an intelligence analogous to that of human beings.

The bee community is autocratically ruled by a queen. Her subjects are males, called "drones," and sterile females, called "workers." As soon as the queen has been fertilized the workers fall upon their indolent and defenseless brothers, the drones, and sting them to death or throw them out to perish in the cold. All the labor of the hive, all the fighting in war, is done by the workers. The food of bees consists of honey and "bee bread." The more nutritious bee bread has the effect, when fed to a female larva, of developing it into a queen. Only one queen is required for a hive, but the far-sighted bees always raise several. If any accident happens to the reigning sovereign they then have other females they can raise to the throne.

The eggs are all laid by the queen. During the season of reproduction the queen requires so much food that a dozen or more workers are appointed to wait upon her. She walks about the hive, accompanied by her retinue, and drops an egg in each cell. A highly remarkable thing is that she can control the sex of her eggs, and always puts worker eggs in worker cells and drone eggs in drone cells. If so many larvae hatch out as to overcrowd the hive it is the duty of the old queen to lead forth a swarm. The young queens have to be kept in close confinement until the old queen departs, for if they were out the old queen would kill them. Should the hive still be overcrowded one of the young queens leads forth another swarm. "That bees profit by experience" is shown by the fact that before the old queen leads forth a swarm she always sends out scouts to reconnoiter the ground, while a young queen never does. When the swarming season is over, if there still are two or more queens in the nest, they are all liberated at once, and, while the workers stand around and apparently cheer them on, they fight desperately for possession of the throne until all but one is dead. Huber

relates that he once saw two queens in a position simultaneously to sting each other to death. They at once released their grasp as if in horror of a situation that might end in leaving the hive queenless.

As soon as a bee arrives at its hive with news it emits two or three shrill notes and taps a comrade with its long, flexible, slender antennae. The news is transmitted in the same way through the hive; and if it is of a startling character, will soon cause a great buzzing and commotion. F. Muller once saw several workers pushing the queen in an odd way with their heads and trying to tell her of some cells in which she had dropped no eggs. The queen understood them, but as she could find no empty cells she went off. "Thus the workers knew how to advise the queen that something was as yet to be done, but they knew not how to show her where it had to be done."

These little insects have effective means of protecting their hives against intruders, as many people have good cause to know. If a strange bee, not a queen, attempts to enter and is detected, it is speedily surrounded and stung to death. When a hive is attacked by the death's head moth the bees close the entrance of their hive with wax and propolis and keep it closed until a season comes when moth of this species are not numerous. Mice, slugs, etc., which get into the hive are killed and covered with propolis to prevent their putrefaction, which would make the ingenious insects sick. Reaumur once saw a snail enter a hive. The bees were unable to sting it because of its shell. They therefore fastened it to the wall with wax and resin and left it there to starve.

They fully appreciate the importance of keeping pure the air in their hives, and have a curious and effective method of ventilating. When the temperature gets too high a large number of workers are told off who station themselves through all parts of the dwelling, and, by beating rapidly with their wings, produce a draft so strong, according to Huber, as to extinguish a lighted match. The practice of ventilating has been developed under domestication. There was no lack of fresh air in the cool and roomy caves and trunks of trees they inhabited in a state of nature.

Nothing more strikingly evinces the mental capacity of bees than the fact that they learn to distinguish their friends from their enemies and the readiness with which they lend themselves to tuition by their keepers. The story is told of an English beekeeper, named Wildman who could at any moment in some secret way bring a whole swarm of bees about his head. He also had his bees so trained that when commanded to do so they would form into companies, regiments, and battalions. At the word "March!" the Illiputian army advanced in good order until told to halt. The little soldiers were so well taught that they never stung any of the many people

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