

One worker, Nome, Alaska, August 24-25, 1916 (F. Johansen) differs from specimens of the queen in the Canadian National Collection from Banff, Alta., in having the first segment of the abdomen not wholly black.

NOTES ON THE BUMBLE-BEES.

The specimens generally are remarkable for their long shaggy hair and their large size, both well-known attributes of the arctic *Bombus*. Two species, *B. neoboreus* and *B. sylvestris* var. *johanseni* from Bernard harbour, Northwest Territories, show pronounced melanism. Melanism is rare in the North American bumble-bee fauna and has been heretofore met with only in occasional specimens, but there is a large region of pronounced melanism in Northwestern Europe centred in Denmark and extending to the Alps, the British Isles and Southern Scandinavia.

Bombus is particularly well adapted to arctic conditions. These bees develop considerable body heat and their warm coat enables them to keep active in low temperatures. Even in the temperate region the queens of some of the species may be seen collecting nectar and pollen from the willows and other flowers in the sunshine of early morning while frost is still on the ground. The arctic summer permits such activity at almost any hour of the day or night, provided nectar can be obtained, and this probably is an easy matter on account of the numerous flowers.

The home of the bumble-bee colony is always made in a nest composed of warm material, usually the deserted nest of some mammal or bird. The Arctic species, so far as we know, like most of the other species, select nests under the ground, a position which provides good protection from the weather. The brood of *Bombus* needs to be incubated by heat from the body of the adult bees, but can endure a longer-continued and greater degree of chill than that of *Apis* without dying, but its development is retarded and the lustre of the coat of the resulting perfect insect is reduced if the pupae are chilled. A lack of lustre is characteristic of some Arctic specimens of *Bombus*. It is, however, probable that the chilling of the brood is not frequent, because under favourable conditions the queen will, in two or three hours, collect and store in a large waxen cell she constructs in her nest, enough nectar to keep herself and her brood warm for twelve to twenty hours, and, in a later stage of the colony, the workers will accumulate enough honey in the vacated cocoons to last several days.

One of the species of *Bombus* from the Canadian Arctic belongs to the *Pratorum* group, several temperate zone species of which are very hardy and early. *B. pratorum* itself is the earliest species of *Bombus* to start nesting in England, where the young colonies occasionally have to withstand a snow-storm in April. The four other species from the Canadian Arctic belong to the *Kirbyellus* group which is confined to the Arctic and high mountain regions of the northern hemisphere. The brood and adults of this group may be expected to resist cold still better than those of the *Pratorum* group, and to be especially well able to survive, in a state of semi-torpority, a period, lasting several days, when long-continued bad weather prevents the collecting of food, a character already fairly well developed in *Bombus pratorum*.

The taking by an Eskimo at Cape James Ross, Melville island, on June 21, 1916, at a latitude of almost 75°, evidently from a nest, of five nearly full-fed *Bombus* larvae, which were brought back by Mr. Stefansson, indicates that the eggs must have been laid not later than the 8th or 9th of June, and is surely a remarkable record of the favourable conditions that exist for bumble-bee life in the far north, at least in some seasons. Half a dozen *Bombus* cocoons containing dead pupae were taken from the same locality by Mr. Storkerson in April, 1916.

An old *Bombus* nest containing a couple of dead pupae was brought in by Dr. R. M. Anderson on November 12, 1913, from the Sadlerochit river, Alaska; it