

species great amount of liquid in the alimentary tract.

In fact, in pickled brood the adult bee is with scarcely affected; in the larva and pupa the same conditions are found. It is in the adult bee in dysentery, and they do not have known pickled brood to follow dysentery and finish the destruction of the already decimated colony. I do not know of this, which is strickly a fungus disease, the attack seldom occurs before the feeding of pollen, yet I have sometimes found it earlier in larval life, where the disease had principally been previously. Combs which have been diseased any disease, whether of a fungus or bacterial nature, are never entirely free from the infection; while many colonies may be free and safe, yet, as a rule, there always lurks spores capable of reinfection. Nearly all bees of the breed contains fungi of various forms, which are gathered with it, but which, at first, are unimportant, as they do not grow except on the leaves of plants, grasses, casts, etc., and are incapable of producing stomach disease.

In the two colonies which were engaged for experimental purposes last spring, in which black brood was present, well developed and thoroughly established, the disease entirely disappeared during the spring honey-flow from horsemint; they became strong, and one swarmed, giving off from the good swarm, which was placed in the new hive of the hives, on the infected individual combs left after the death of the colonies used last winter in experiment it might be interesting with this same black brood.

What I did in order to make a more severe test on a new swarm during the good honey-flow, I used a sufficient number of all the combs sent from New York last fall to fill a frame, transferred these to the centre of the new brood-nest and watched the results. The combs were all thoroughly disinfected and cleaned, and no disease occurred in this hive. A cessation of

the honey-flow in the latter part of July came, and the disease reappeared, so that on the first of August quite a number of both larvæ and pupæ were found diseased. The fall honey-flow came in about this time, so that on Aug. 20th no sign of the disease was present. The disease recurred in one of the colonies used last spring—not the one which swarmed, nor in the new swarm.

In this disease the first germ-growth appears in the ventriculus, which, in the larva, is a blind sack, which, on account of the sedentary life and liquid food provided, is not a fully developed alimentary canal till late in pupal life. There is no evidence of solid excreta until after the bee is hatched and begins to take food. In the larvæ the stomach (ventriculus) appears distended with pollen-grains, partially digested pollen atoms, chyle, a few fungi, bacteria, etc. The urinary apparatus, which develops early in larval life, appears engorged, sometimes colonies of bacteria are found within them. Much distortion and faulty development results from arrest of nutrition to the internal organs; there is a general abnormality of the glandular structures from faulty development. These developmental errors are due to the influence of the poisons elaborated by the bacteria in the digestive organs. In many examinations I have never been able to find growths or scattering bacteria in the dorsal vessel—which is the heart of the bee—or in parts of the vascular system.

In foul brood, if the egg has been deposited in a foul cell, when the food comes in contact with the infectious material, a suitable media is formed for the growth of the germ, and bacterial changes in the food destroy its nutritive qualities, and the young larva dies of starvation or from the effects of the poisons.