WAX MOTHS AND AMERICAN FOUL BROOD

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U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY
Bulletin No. 75, Part II.

Introduction

It has generally been held by bee-keepers that, while the wax moths often cause considerable damage by destroying surplus combs and in other ways, they were not an unmixed evil, for by destroying combs infected with brood disease they were supposed to remove the infection. Text-books on apiculture and articles in various bee journals have repeatedly reiterated this statement . Evidently no person has seen fit to look into the question thoroughly, and it is the object of the present paper to record some observations which have been made.

When a bee larva dies from infection of American foul brood, it decays rapidly, and the mass becomes ropy, so that if a small stick or pin is inserted in the decayed mass and removed, the larval material adheres to it and will string out for an inch or more. This ropiness of the dead larva is very characteristic of this brood disease. Seemingly this ropiness makes it impossible for the bees to remove the infected material, and when the decayed mass dries down it forms a scale which adheres so tightly to the lower side wall of the cell that it cannot be removed without tearing the wax wall.

As the disease progresses in the colony the various cells of the brood chamber come to contain diseased larvæ and, later, scales formed of dried larvæ. It is probable that after a cell once comes to contain a diseased larva, it is almost impossible for another larva to reach maturity in a healthy condition, consequently the number of bees which reach the adult condition is constantly reduced and, as the old field bees die and are not fully replaced, the colony becomes weakened and finally dies out completely.

As long as the colony is strong the wax moths can do no damage, but as the bees decrease in number the combs offer a foothold to one or other of the moths and within a very short time the whole hive is one mass of wax moth tunnels, larval excreta and cocoons. The combs are completely destroyed, and nothing remains but the web and a mass of débris on the hive bottoms. If the moth larvæ actually ate the infected material, they would serve to remove the infection where the bee-keeper is too careless to do so—as is too frequently the case.

The two wax moths differ greatly in their habits in some respects, but it is not the purpose of this paper to discuss these points. The large wax moth (Galleria mellonella L.) is the most widely distributed, and is found in practically every part of the United States, and probably wherever the honey bee is now kept. The lesser wax moth (Achroia grisella Fab.), on the other hand, is not so widely distributed, but it is known to exist in various localities in this country.

Work of the Large Wax Moth

(Galleria mellonella L.)

Plate I is from a photograph of a comb, infected with American foul brood, on which larvæ of the large wax moth were placed. The comb was placed in a box to exclude light and was laid flat on a piece of paper. The larvæ at first worked on the under side of the comb, but gradually they got to the upper surface. It will be noticed that in one part of the comb the lower side walls of the cells remain intact; here the dried-down scales of American foul brood were thickest, and evidently this was the centre of the brood during the time of infection. The remainder of the area formerly occupied by comb is nothing but débris, with a few scales scattered here and there. Evidently only where scales are thick do they hold to-

PLATE I.—WORK OF THE LARGE WAX MOTH (GALLERIA MELLONELLA) IN COMB INFECTED WITH AMERICAN FOUL BROOD. (ORIGINAL.)