

would appear that the older adults of the broods excavate branching chambers in which new broods are developed, and that in these old and new chambers they all pass the winter.

*Enemies.*

A number of predaceous beetles and their larvæ may find their way into the brood-chambers at unguarded moments and destroy a portion or all of the colony. This, like other species of ambrosia beetles, appears to be aware of the danger from this source, at any rate, from the time the first eggs are deposited until all the individuals of a colony have developed and emerged from the brood-chambers, one or more adult females serve on guard duty at the entrance, where their armed elytral declivity (as shown in Plate 2, fig. 7; Plate 3, fig. 9) completely fills the entrance gallery, thus presenting an impenetrable barrier against intruders. It is therefore only at unguarded moments that the enemy can enter, except, perhaps, the very young, microscopic larvæ of the predaceous beetles, which may possibly pass the sentinels unobserved. This guard duty is an interesting feature of intelligence in the habits of all Scolytids. In the case of bark beetles and other species in which the sexes are about equally divided, the male is the sentinel, while the female excavates the brood gallery. Perhaps there is no better example of unselfish devotion to paternal duty than the male bark beetles, since they not only spend their lives on guard, but die at their posts in order that their dead bodies may continue to blockade the entrance to the brood galleries. In Xyleborous, and others in which the females greatly predominate, one or more females serve on guard duty.

The excessively crowded brood-chambers doubtless offer favourable conditions for diseases, which may, as indicated by evidence before me<sup>1</sup>, destroy an entire colony.

*Relation of the Insect to the Health of the Trees Infested by It.*

Eichhoff<sup>2</sup> was undecided as to whether or not the species did any damage to the trees infested by it, but mentioned that it might prove destructive to orchards or nursery trees. Hubbard<sup>3</sup> states that it "breeds only in dying trees," but does much injury to the timber, causing defects in the wood, and the writer<sup>4</sup> mentioned that it probably hastens the death

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1. In a brood-chamber before me a number of dead larvæ and pupæ are found, which have evidently died quite recently from a disease of some sort which cannot at present be studied or determined.

2. European Bark Beetles, l. c.

3. Ambrosia Beetles of North America, l. c.

4. Bull. 31, W. Va. Agri. Expt. Sta., l. c.