

FIRE WOUNDS THE PRIME CAUSE OF SERIOUS LOSS OF TIMBER.

In studying the forest conditions and the influences that contribute to the destruction of timber, I have found that a slight injury to the base of a tree by fire offers favourable conditions for the attack of insects, which result in the final destruction of the valuable wood of the tree. The fire burns and kills the bark at one side of the base of the tree, which in itself might not be a serious matter, since subsequent growth would heal it over, but it was found that these slight wounds are subsequently infested by Ptinid, Scolytid and Calandrid beetles and their larvæ; also by Cerambycid, Buprestid and Lepidopterous larvæ, which by their boring either convert the inner dead wood into a dry powder, or their mines give entrance to a "dry rot" fungus*, so that another forest fire finds in these extended wounds the conditions most favourable for a still further extension of the injury. Thus, frequent fires in the same forest may, by this process, burn entirely through the trunk of a large tree.

It was also found that these fire wounds are almost invariably followed by a decayed condition of the heartwood, which results finally in a hollow trunk. Previous observations led me to believe that insects were largely to blame for the destruction of the heartwood of living trees injured by fire and other causes. I therefore had a number of wounded trees felled on November 9th, 1895, and the trunks split open so that I could examine the causes and effects.

I found in nearly every tree thus examined that the rapid extension of the decay was due largely to Cerambycid, Lymexylon and Brenthid larvæ which had entered from eggs deposited in the edges of the fire wounds, and that brood after brood of these larvæ, aided by wood-infesting ants, had completely honeycombed the heartwood for a great distance above the wound. Thus the valuable heartwood was completely destroyed or rendered worthless. By persistent search I was fortunate enough to find in the heart of a chestnut tree the imago of one of the Cerambycid borers, where it had recently transformed within its pupa case. It was located near the heart of the tree, and about four feet and a half above the upper edge of the wound, and three feet above any decayed wood. This beetle was identified for me through the kindness of Mr. Howard, of the Division of Entomology, as *Centrodera bicolor*.

On May 19th, 1896, I cut another example of this species from a tulip log, at Pickens, W. Va., where I had previously discovered (June

* *Merulius lacrimans*.