

FOREST-INSECT EXPLORATIONS IN THE SUMMER OF 1902.

[REVISED BY DR. HOPKINS FROM THE STENOGRAPHIC NOTES.]

Dr. Hopkins gave an account of his preliminary survey, during the past summer, of the forest regions of different sections of the country to determine the primary enemies of forest trees and locate the areas of principal depredations. Between July and November he was in 27 States and two territories. His first trip was made through the South-eastern States, to determine the area of a recent outbreak of *Dendroctonus frontalis*. He found in the southern Appalachian region that this, one of the most destructive insects of American coniferous forests, was commencing its ravages as it did a few years previous to the great devastation wrought by it in the Virginias. He spoke of the probability that some of these insects, which are for a long time exceedingly rare, then suddenly make their appearance in vast numbers, taking the character of an invasion, are varieties of the typical forms which, on account of favorable variations, are capable of extending their range into new areas, and also to overcome the resistance exerted by the living trees attacked by them, which could not be overcome by the typical forms. He gave as an example the results of his study of *Dendroctonus frontalis*, in which he found that the form which was so exceedingly common and destructive in the Virginias was a variety of the form described by Zimmerman many years ago.

After locating the trouble in the vicinity of Fletcher's and Tryon, N. C., he travelled southward through South Carolina and Georgia to Tampa, Florida, and returned by another route, to determine the extent of this new outbreak. Returning to Washington from this trip, he proceeded to the Black Hills, in South Dakota, where a vast amount of pine timber has been killed by *Dendroctonus ponderosa*, as has been mentioned in Bulletin 32, new series, Division of Entomology. This species, he said, is another example of apparent variation from a western type, *D. monticola*, Hopk. MS. It has distinctive and constant characters of structure and habit which are sufficient to entitle it to the rank of a species, and he believes that it is possibly of recent development. *D. monticola* attacks the mountain pine (*Pinus monticola*) in Idaho, and the sugar pine (*P. Lambertiana*) in Oregon. The smaller size of this species, the more primitive character of its gallery, and its wider distribution, indicate that it is the stock from which *Dendroctonus ponderosa* has sprung. The latter is apparently more restricted in its range, having been found only in the