

RECENT CANADIAN PUBLICATIONS.

(Continued from Vol. L, p. 427).

CANADIAN BARK-BEETLES. PART II—A PRELIMINARY CLASSIFICATION WITH AN ACCOUNT OF THE HABITS, INJURIES AND MEANS OF CONTROL. By J. M. Swaine. Bulletin No. 14 (Technical Bulletin) Dept. of Agriculture, Entomological Branch, Ottawa. Issued Sept. 6, 1918. 143 pp. 31 pls.

It is only within comparatively recent years that the importance of the Bark-beetles as enemies of North American forests has been fully appreciated even by the forest entomologist. Every year the necessity of stricter economy in the conservation and utilization of our forests becomes more urgent, and it is, therefore, fortunate that we have in Canada so able an authority as Mr. Swaine as a source of information, both practical and scientific, on this group of depredators.

The first part of this bulletin, which was published in 1917, contains descriptions of a large number of new species of bark-beetles. The second part treats of their habits, bionomics and classification, as stated in the title, and has been prepared with the object of enabling students and practical foresters to identify the Canadian species of this group of insects. It is divided into four sections, the first entitled "The Beetles and their Habits;" the second, "Bark-beetle Injuries and the Means of Control;" the third, "Structural Characters of the Bark-beetles," and the fourth, "Classification. A Preliminary Arrangement of the Canadian Bark-beetles."

Section I is an admirable account of the general life-history of these insects, based upon an intimate first-hand knowledge of a great variety of species. The different types of egg tunnels, larval mines, methods of oviposition, and other details of their habits are described with conciseness and precision. Among other interesting features in this section are the statements that the so-called ventilation tunnels are used mainly as turning-niches by the females during oviposition and as storage places for boring dust and that the nuptial chambers are used by some species for the same purposes.

In Section II the species of bark-beetles are grouped under three headings, primary enemies, secondary enemies and neutral species. Primary enemies are those species which commonly attack and kill healthy trees, the most important of these being certain large forms belonging to the genus *Dendroctonus*. Secondary enemies are those species which habitually breed in the bark of dying trees and logs, but these are frequently injurious in that they kill weakened trees which might otherwise recover. Secondary enemies may become of primary importance under conditions favourable for their rapid reproduction, as in the case of various species of *Ips*. All of the Canadian species under normal conditions seem to prefer to breed in dying or weakened trees. Some of the twig-boring species may be abundant enough to cause some injury, while others may be actually beneficial by hastening the death of the lower branches of pines and spruces, thus helping to produce cleaner trunks. The neutral species are of no economic importance as they breed only in dying or dead bark.

Attention is called to the effect which neglected slashings produce in increasing the number of scattered dying trees in the vicinity on account of the favourable conditions thus brought about for the breeding of bark-beetles.