

CHAPTER IV.—RESEARCH AND EXPERIMENTS.

1. FOREST-MANAGEMENT.

It is gratifying to record that the compilation of an inventory of the plantation was finally completed. This marks a most important forward step, as the inventory gives such detailed information in regard to the growth and yield of the plantations that it can be fittingly described as one of the key works to national afforestation in the Dominion, and will prove most valuable in the formulation of future working plans for the plantations.

The preparation of planting plans, one of the main forestry fundamentals, is proceeding, but owing to the many urgent calls upon the staff rapid progress has not been possible. It is intended, however, to devote more time to this important aspect of our operations during the coming year.

Mill-conversion studies have been continued, and the year's investigations were devoted to the various defects common in many forests and their results on timber appraisals. Another year will be necessary to complete this important study, when it is hoped that from the data obtained timber-measuring will be put on a firmer and more scientific basis.

Improved System of Communication.

Owing to the rapid increase in area of the exotic plantations, improved telephone communication between the various units and the central station, &c., became urgently necessary, and a special portable telephone was designed and constructed at low cost. The apparatus gave excellent results, and worked efficiently on the existing telephone-line.

Ten portable Army second-hand telephones were obtained from England, but were not so successful.

It is interesting to note that the use of radio communication in forestry operations is now having world-wide recognition. In Ontario modern short-wave stations have been set up for intercommunication, and also for use with fire-patrolling aircraft. The British Columbia Forest Service operates a long line of stations, and the Vanokoro Kauri Timber Co. in the Solomon Islands has two powerful stations situated on different islands in that group.

2. FOREST ENTOMOLOGY.

With the concurrence of the Department of Agriculture, the services of Mr. David Miller, M.Sc., Government Entomologist, were again made available to the Service to continue his forest-insect survey, and investigations were carried out in the provinces of Marlborough and Taranaki, and in the Hamilton-Taupo-Rotorua district, regarding the ravages, spread, &c., of the *Sirex juvenus* saw-fly. It was found that this insect is commonly distributed throughout these areas, but confines its attention to weakened, suppressed, or injured trees, and although it is capable of ovipositing in healthy trees no injury results. Evidence is not lacking that the Australian longhorn beetles of eucalyptus have become established in the Dominion, as in one district they were discovered attacking living *E. globulus* trees over twenty years old. The larvæ of the beetles arrive under the bark of imported hardwood poles, and until some stricter examination is made compulsory in regard to all imported timber this danger will continue to exist. It is hoped that suitable action to deal with this serious menace will be taken in the near future. The same remarks, unfortunately, apply to imported redwood timber, in consignments of which the North American species of *Siricidae* (the same group to which *Sirex* belongs) have been discovered in a live state. Under Mr. Miller's direction a comprehensive survey was also made of the exotic plantations in Taranaki and Canterbury, and the information obtained has been carefully recorded for future reference.

The study of Scolytid weevils attacking milled timber and of the two-toothed long-horn beetle attacking seasoned timber are under way, but have not yet been completed. It is evident, however, that the latter insect is widely established in wooden buildings and is causing considerable damage.

Several consignments of the parasite of the gum-tree weevil were received through the courtesy of the South African Entomological Service, and after being reared were distributed throughout the Dominion.

The ladybird-beetle (*Rhizobius ventralis*) was also distributed to combat the gum-tree scale in those districts where the scale has become epidemic. This insect is rapidly spreading through the North Island, and upon request consignments can be sent to any district where the scale makes its appearance.

Two parasites of the steel-blue saw-fly (*Sirex juvenus*) have been located and studied by the English entomological authorities, and arrangements have been made for consignments of these parasites to be despatched to New Zealand next summer.

Towards the close of the year Mr. Miller was appointed to the important position of Chief of the Department of Entomology, Cawthron Institute, Nelson, which, it is regretfully announced, compelled him to relinquish his active connection with the Service. It has been possible, however, to retain his services in an advisory capacity until the primary projected activities in forest entomology are completed—i.e., till the 31st March, 1929.

3. FOREST ECOLOGY.

Part II of the "Monograph on the New Zealand Beech Forests," by Dr. L. Cockayne, F.R.S., the Service Honorary Botanist, was printed, and is now on public sale. This very valuable publication consists of fifty-nine pages, profusely illustrated, and deals with our beech forests from the practical and economic standpoint.

The same author has rewritten his book "The Vegetation of New Zealand." The new edition will contain a new classification of the indigenous forests, with additional information as to their character and development, which will prove of great interest and value to all forestry students.