

- (1) The condition of the forest and the timber species in general, the extent of the timber-bearing area, and the non-timber-bearing areas.
- (2) The means by which the forest can be improved and the range of the valuable species extended over the now non-producing areas, such as those which are covered in native forest scrub and the open manuka-covered land.

That the staff will have a wide field of activity will be realized, when it is stated that their duties will cover the following studies:—

- (a) The demarcation of the forest types and the assessment of the working capital at present in the forest.
- (b) The establishment of permanent observation areas to ascertain the causes of the present conditions found within the various forest types, both vigorous and decadent.
- (c) The creation of those conditions which after observations are deemed to be most beneficial for the growth of the more valuable species, and thereby the possible extension of these species over the large areas where they do not now occur.
- (d) The investigation of the growth and yield of the main timber species, particularly kauri, in order to arrive at definite facts on a much discussed subject.
- (e) Investigation of the seeding periods of the main species, the collection of seed, its testing and growing.
- (f) The bleeding of kauri for resin, investigation of the flow of gum, and the effect of the bleeding on the general condition of the tree and the timber.
- (g) Investigation of factors influencing fire danger (weather and humidity observations).
- (h) Investigation (by co-ordination) of fungi, insects, &c., affecting the growth and life of the main timber-trees.
- (i) Collection of herbarium specimens and the study of the anatomy and structure of the native timbers. Also the maintenance of exchange of such stock with other similar institutions, both domestic and foreign.

Waipoua State Forest is a national asset of approximately 40,000 acres, and as the last remaining kauri-forest of any size in the Dominion it has a sentimental and unique interest quite apart from its commercial value which demands that it be zealously conserved and extended if possible. It may be safely asserted that when the investigations mentioned are carried to finality, the resultant data will pave the way for the compilation of a working-plan to enable this last stand of New Zealand's finest timber to be placed under proper silvicultural management.

Underplanting in Cut-over Forest.

Approximately 12 acres of cut-over beech forest at Golden Downs (Nelson Region) was selected for this experiment and prior to planting-operations several large beech-trees were felled to let in light.

The following species were then underplanted in pegged-off plots: *Sequoia sempervirens*, *C. Lawsoniana*, and *Thuya plicata*. An 89 per cent. strike was obtained, and the trees have made very good growth.

The object of the plots is to ascertain the most suitable species to underplant cut-over areas of native forest; further work in this connection will be carried out during the coming year, using *Cryptomeria japonica* and other available species.

Silver-pine Sample Plot.

At Erua, on the Main Trunk Line (Wellington Region) a silvicultural experiment was commenced in order to observe the growth of silver pines (*Dacrydium* spp.) under both natural and artificially improved conditions, by draining the soil and neutralizing the acid therein. The sample plot is being operated on the theory that the slow growth of many of our native species may be directly due to an overacidity of soil.

Bleeding of Pinus Radiata and Pinus Pinaster.

The bleeding of various species of conifers for the production of resin, turpentine, &c. (generally known as the naval stores industry owing to the fact that in the early years of the seventeenth century wooden naval vessels used large quantities of tar and pitch) has been practised for several centuries in many European countries and in later years in America and to a lesser degree in parts of India and Sumatra, but it is believed that the experiment inaugurated by the Service at Riverhead (Auckland) in September, 1929, was the first of its kind so far as the Dominion is concerned. Two species only, *Pinus radiata* and *Pinus pinaster* were selected, and one hundred trees of each species were tapped. Samples of the gum were submitted to the Government Analyst, whose analysis showed the average composition to be as follows:—

					<i>Pinus radiata.</i>	<i>Pinus pinaster.</i>
					Per Cent.	Per Cent.
Turpentine oil	..	..	..	..	22.4	20.6
Resin	..	..	..	..	71.7	68.0
Water and impurities	..	..	..	..	5.9	11.4