estimated. After an area is logged much light and sun are admitted, the floor and slash dry up, and become as tinder during the summer. Sooner or later a fire starts, perhaps from a logging winch or locomotive. This fire spreads miles in a few hours. All taxad seeds and seedlings are destroyed. After a month or two various weeds gain a footing; 'fireweed' *(Erechtites)* is the common first-comer. Other weeds, chiefly exotics, come in; stock often browse round and bring weed-seeds with them. A second growth of broad-leafers, such as wineberry and fuchsia, comes up from seed carried probably by birds. Frequently another fire occurs, and the process recommences, only this time weeds and fern soon get the upper hand. In this manner the original forest-floor, the seed-bed *par excellence* of the taxads, is destroyed, and is replaced by a thick matted turf of exotic weeds, native sedges and rushes, blackberry and fern, and the whole area becomes a waste, the handling of which for afforestation presents a difficult problem. The need for fire-control must be emphasized. Fire must be regarded as an evil—a more or less preventable evil."

The completion of this research will enable the definitive formulation of silvicultural and logging regulations on the State-forest lands of Westland.

Study of the Structure and Growth of New Zealand Taxad Trees.

Two very important subsidized studies were commenced last year at Canterbury University College by Miss F. B. Murray, M.A., and Mr. E. W. Bennett, M.Sc., under the direction of Dr. Charles Chilton, with whom was associated Mr. Charles Foweraker. The first research (conducted by Miss Murray) will disclose the condition of taxad-seed germination and the growth and establishment of taxad seedlings, a knowledge of which is vital to proper silvicultural regulation. Miss Murray has practically completed the following precis of research:—

(1.) Investigation of the fruit and seed of silver-pine *(Dacrydium Colensoi)*, with notes and drawings.

(2.) Investigation of the stages in germination and establishment of the seedling of silver-pine. Complete description and drawings have been made.

(3.) Comparison of the seedling of silver-pine with that of rimu *(D. cupressinum)*, with descriptions and drawings. A table of features for identification of these two very similar seedlings has been outlined.

(4.) Preliminary investigation of the seedlings of miro *(Podocarpus ferrugineus)*, kahikatea *(P. dacrydioides)*, and matai *(P. spicatus)*.

This research is of the utmost importance, as it aims at covering—(*a*) The season of seed maturity; (*b*) the percentage of fertile seed produced by average taxads; (*c*) the physical and chemical conditions of the seed-bed; (*d*) the time of germination under known physical conditions; (*e*) the establishment of the seedling; (*f*) the reaction of the seedling to environmental changes.

(5.) Preliminary investigations on the structure of the fruit and seed of miro, kahikatea, and totara.

The second research (by Mr. Bennett) deals with the nature and significance of the growth-rings and the volume increment of wood in the New Zealand taxads. Systematic investigation was begun on the totara *(Podocarpus totara)* by a morphological study of the winter-bud scales, scale-scars, and whorls, to be followed by age calculations of branches and anatomical investigation of the stem of totara, miro, and matai.

KEY TO THE IDENTIFICATION OF NEW ZEALAND TIMBERS.

Professor Kirk, of Victoria University College, has undertaken during the year a most valuable study of the utmost economic importance—*i.e.*, the working-out by microscopic means of a key to the identification of all our commercial trees. (This Service has gladly undertaken to supply Professor Kirk with a wide range of wood specimens, accurately named.) Professor Kirk reports substantial progress in this labour of love, and it is understood that he will make public the result of his research within a few months.

THE NEW ZEALAND BEECHES.

The outstanding scientific event of the year was the announcement of Dr. Cockayne, F.R.S., on the hybridization of the red-beech *(Nothofagus fusca)* with the mountain-beech *(Nothofagus cliffortioides)* or the black-beech *(Nothofagus solandri)*. It is hoped that Dr. Cockayne may be enabled to continue this valuable research to completion.

DEMARCATION OF SAMPLE PLOTS.

One of the first steps in organizing our forests and regulating the cut therefrom is to ascertain the rate of growth, the annual increment, and the forest relation to light, climate, and soil factors. To ascertain volume accretion over a period of years it is necessary to establish, measure, and record many plots of growing forest, containing thousands of trees of all ages and classes, as true average resultants are only possible by this means. During the year, in pursuance of this need, thirteen representative sample plots were defined and carefully recorded for recurrent measurement in the Auckland, Rotorua, and Westland regions.

FOREST EXPERIMENT STATION.

The crystallization of a sane policy of silviculture and the building-up of a forest-management technique must be based largely on adherence to natural laws. Therefore continuous study and observation of different methods of planting, logging, forest-protection, forest grazing, and the influence of exploitation on the regeneration of the profitable species, on stream-flow, run-off, and climate, is vital to