

Two patented fixtures, constructions for butter-boxes, using only one-third of the timber volume of the old-style box, were submitted to test, and the designs much improved thereby.

Substantial assistance has been rendered to the public in the identification of indigenous timbers involved in sales and disputes. In this connection Professor Kirk, of Victoria College, has lent his time and knowledge in the intricate microscopic examination of many critical specimens. To him is extended the grateful appreciation of the Service and its friends.

Arrangements were concluded with the Dominion Federated Sawmillers' Association during the year whereby Dr. H. Tiemann, the world's authority on timber seasoning and conditioning, was retained to visit New Zealand to review the timber-conditioning problem and suggest ways and means of betterment. (A full report will be published this current year on the result of Dr. Tiemann's investigations.)

Service tests of certain New Zealand timbers as to their suitability for telegraph-, telephone-, and transmission-line purposes were begun during the year, and final results will be available within the current year. The timbers tested were rata, kowhai, and red-beech.

With a view to developing a cheap but effective method for preserving posts, poles, and outdoor constructional timber cut from plantation trees, wind-breaks, and shelter-belts, a co-operative treating project was entered into with the New Zealand Coal-tar Products Company, of Wanganui. The experimental plant was erected at the State Rotorua tree-nurseries, and a series of tests and experiments were begun and are now under way. (A bulletin containing a full description of the cost, construction, use, and cost of operation of a simple inexpensive form of heating plant for farmers will be published within twelve months.)

A depository for all statistics bearing on timber-manufacturers, timber-users, timber-production, import and export, has been established, and during the year over three hundred memoranda of advice and assistance have been given to timber-users. An educational exhibit and display of New Zealand timbers was made in conjunction with the Dominion Federated Sawmillers' Association at the Wellington Tariff Exhibition, and was inspected by over four thousand visitors. With a view to demonstrating the versatility and effectiveness of certain New Zealand woods, certain sample products were constructed and placed in service. These products included tool-handles and clothes-pegs from beech; beer-barrels, butter-boxes, and tallow-casks from tawa; and wooden matches from waste white-pine. (Bulletins dealing with the use of tawa and Southland beech will be published in this calendar year.)

Letters of advice on plant lay-out and special machinery were given to a large number of manufacturers during the year. (The timber-using public is invited to take full advantage of the facilities of this Forest Service in any matter concerning wood.)

SILVICIAL AND SILVICULTURAL RESEARCH.

Success in producing New Zealand's timber requirements will only come by reproducing and rebuilding our great indigenous forests. It is to the woods of Westland, Southland, and the central North Island that the Dominion must ultimately look for its major supplies, for there are the forests and the lands chiefly suitable for forestry. Whether the key to silviculture will be found by the regeneration of the indigenous forests, the propagation of exotic pines, or by a compromise remains yet to be determined. It is to these serious and vital practical problems that the silvical work of the Service has been confined during the year. Mr. W. R. McGregor, M.Sc., of Auckland University College, has continued his investigation into the life-history of the kauri forest on the Waitakere Ranges and in the Waipoua Forest, with very satisfactory interim results. Substantial progress in the investigation of the floristic aspects, and of the various habitat factors, have been made. Instruments have been evolved for photometric purposes, and a considerable volume of data concerning light-requirements and light-conditions in different types was collected. Several experimental plots for the periodic measurement of kauri rate of growth were established, and several hundred records taken. The study of the kauri reproductive habits has been pushed to near completion, and the fruiting characteristics of the tree have been subjected to review.

Mr. McGregor states: "It is hoped that the coming season may see the establishment of several field experimental stations on a more satisfactory basis than has been possible hitherto. In carrying out the research one of the greatest difficulties arises from the complete lack of reasonably trained assistance in the field. . . . I would again emphasize the necessity for the preservation of all natural shelter wood on land unsuitable or not immediately necessary for agriculture. . . . 'Cut-over' country is generally considered worthless and subjected to much wanton destruction; yet I believe that one result of the present investigation will be to establish the fact that such areas are destined to prove forest capital of the first value."

Outstanding progress has been made in the research investigations of Mr. Charles E. Foweraker, M.A., M.Sc., F.L.S., of Canterbury University College, as to the ecology and regeneration of the taxad rain forest of the South Island west coast. This important study, which will provide the economic key to the re-establishment and practical management of the South Island rain forests, was begun two years ago, and will be continued to completion. Field studies for the year under review were carried out in the Hokitika, Lake Kanieri, Waitaha, Harihari, Okarito, Waiho, and Ngahere localities. Definite data were obtained as to the taxad species and varieties, composition of the forest, climate and geological condition, life-history and natural regeneration, and as to the relation of logging, fire, and stock-grazing to natural regrowth. The interim conclusions of Mr. Foweraker indicate that if logged areas are unfired and stock excluded regeneration is certain.

The opportunity is again taken by Mr. Foweraker to emphasize the forest-fire menace. An extract from his recent report is as follows: "References to fire have been made in this report. Again it must be emphasized that the menace of fire to regeneration on cut-over areas is altogether under-