and in increasing the diameter of the heartwood bole; but since the sapwood is as strong as the heartwood any method which will give the former the same durability is much to be preferred.

With the co-operation of the Government Statistician it has been possible for the first time in the history of the Dominion to make an accurate survey of the wood-using industries. The results of this survey are being incorporated in a report entitled "The Wood-using Industries of New Zealand." Additional statistics regarding the production of timber have also been secured by the Government Statistician, and are incorporated in the report on the timber trade dealt with in Chapter V. A display of New Zealand timbers and wood products was exhibited in conjunction with the New Zealand Federated Sawmillers' Association at the Christchurch Industrial Exhibition. A large number of inquiries were received regarding the use and substitution of New Zealand timbers for imported woods. Over ten thousand visitors inspected the exhibit, in connection with which a publication—Circular No. 1, "Our Forest Resources"—dealing with the uses of New Zealand timbers was issued. Copies are still available for distribution.

The Branch of Forest Products is well equipped to render advice on plant layout and machinery to manufacturers and consumers of timber, and the public is invited to take full advantage of this service.

*Key to the Identification of New Zealand Timbers.*

Professor H. B. Kirk, of Victoria University College, has made steady progress in the highly important research, which he is voluntarily pursuing, of the macroscopic and microscopic structure of New Zealand woods. Professor Kirk states that the preliminary work of dressing samples of the coniferous and taxad woods is nearly completed, and microscope preparations have been made of the majority of these. In the case of the totaras alone, several scores of preparations have been made. When this preliminary portion of the work has been completed, the final task of determining diagnostic characters will enable the identification key to be drawn up. The Forest Products Branch of the Service is continually receiving wood samples for identification, and the results of Professor Kirk's research when published will prove of the greatest value.

### 3. FOREST ECONOMICS.

The first duty of the Forest Service to the Dominion is to ensure a permanent timber-supply. To this end it is necessary to establish a balance between the timber sawn and the timber produced by the forest. This year a national Forest Inventory has been completed. The forests available as a capital resource for the production of timber are now known, and investigations to determine their rate of growth are proceeding apace. With these completed it will be possible to shape a forest-management policy which will ensure stability to the timber industry and avoid the dangers and disasters of a wood famine.

That policy will demand the use of secondary timbers, more efficient manufacture and seasoning of wood, and the elimination of waste. The work has already begun: the utilization of beech and tawa for building, interior finish, and furniture, of rata for cross-arms and coach-building, of white-pine for wooden-match manufacture, and of rimu and white-pine for wood-pulp and paper-making, has been demonstrated. Band and gang saws, which produce only one-third of the sawdust made by circular saws, grow in popularity. Many operators have installed sawdust-burning furnaces, saving their slabs, off-cuts, &c., for manufacture into fruit-boxes, broom-handles, turnery products, and small-dimension stock. Several dry kilns have been redesigned and their operation improved. A clothes-peg factory in conjunction with a handle- and dowel-manufacturing plant has been erected in Southland and is now in operation, and a wood-waste exchange has been established for the purpose of placing manufacturers and consumers of small-sized timber, which it is possible to manufacture from waste, in direct communication with one another.

The world-wide depression in the timber industry continued throughout the early part of the year, but markets are now becoming more stabilized, and the prices of overseas timber are slowly mounting. In spite of their long sea-carriage, Canadian, American, and Baltic timbers are still able to compete with New Zealand woods on the Dominion and Australian markets. Cheap timber is only assured to a community by healthy competition between various manufacturing regions. Not only does such competition prevent the creation of a monopoly, but it also encourages better manufacture and utilization and less waste. It is a tribute to the technique of the Canadian manufacturers that they have been able to supply at a competitive price hemlock boxes for the New Zealand export butter trade. New Zealand white-pine is infinitely superior to hemlock for this purpose, and it will no doubt again capture the greater part of this most important market.