

In the exotic conifer trial plots a very pleasing matter to record is the success of the so-called southern pines, particularly loblolly and slash pine. Even long-leaf pine shows great promise, and if this group of pines, not cultivable elsewhere in New Zealand on a large scale, can here be successfully established on some of the open country the station, now purely experimental, could readily be commercialized on the probable combination of southern "piney woods" with perpetual regeneration of kauri in the present forest-proper.

The investigations into regeneration of the rimu forests of Westland have been pursued by the investigators, the staff of Canterbury College School of Forestry, despite the decreased funds made available to them. The most interesting results to date will be forthcoming next year, when the first quinquennial remeasurement of the original plots should take place. Associated with this work, although not directly sponsored by the Forest Service, was an investigation into the soil-acidity of Westland rimu forests. A series of twenty-five plots was established, and the soil in each was tested at different seasons and in various horizons. The soil-acidity was markedly high, over 70 per cent. of the surface horizons showing pH less than 4.0; whilst the highest pH value in any horizon at any time was 5.16. This decrease in acidity was correlated with the ingress of the hardwood species of the genera *Quintinia* and *Weinmannia*, succession species to the coniferous rimu.

Of direct bearing on a different aspect of forestry was a paper published by Dr. L. Cockayne, C.M.G., F.R.S., Hon. Botanist of the Service in the *Journal of the Linnean Society*. This highly important paper described the vegetational changes to date on a protection forest area of subalpine *Nothofagus cliffortioides* burned over about twenty-five years ago. Despite no subsequent human interference, the beech has not yet regenerated in the wind-swept subalpine area, and its previous site is now occupied by three distinct shrub associations, each having arrived after a phase of herbaceous subalpine vegetation. The author's conclusion, after twenty-five year's observation of the area, is that the beech is gone for good because of the inhibiting influence of wind at the alpine-scrub zone, although in sheltered ravines at lower altitudes abundant beech thickets have regenerated during the same period.

### 3. FOREST-UTILIZATION.

Forest-products research has now progressed to a point where the Service is equipped to report upon both the technical and economic phases of every major forest products activity.

#### *Indigenous Forests.*

Practical wood-utilization tests in course of progress during the year included split silver-beech (*Nothofagus Menziesii*) for wine-kegs, sawn silver beech for rifle-stocks and flooring, tawa (*Beilschmiedia tawa*) for clothes-pegs, and creosoted rimu (*Dacrydium cupressinum*) for telegraph-poles.

The silver-beech (*Nothofagus Menziesii*) wine-kegs, now being tested in co-operation with the Department of Agriculture, have proved satisfactory for the first season as regards both tightness and non-tainting properties, but will be kept under observation for some time before any further tests are instituted. Both in Australia and Great Britain silver-beech has also been shown to be promising for rifle-stocks, but the shipments already made for large-scale trials indicate the urgent necessity for better seasoning and grading if the export markets are to be developed to their full capacity.

The tawa (*Beilschmiedia tawa*) clothes-peg tests provide an interesting illustration of the practical value of fundamental research. A study of the mechanical and physical properties of the various indigenous woods, which has been in progress for many years, indicated that the only common species light in colour and in staining, and comparable in cleavage strength with the Canadian birch (*Betula alba*), so widely favoured for clothes-pegs, was tawa. Some timber was, therefore, selected for trial and despatched to North America, where, by courtesy of the U.S.A. Export Machinery Co., it was successfully made up into clothes-pegs, which were returned to New Zealand and submitted to practical tests. These results have since been translated into commercial practice by the establishment of a factory at Hamilton which is now producing tawa clothes-pegs at the rate of 400 gross per day.

Butter-box studies continue to engage the attention of the Service, acting in co-operation with the Dairy Division of the Department of Agriculture. Complaints regarding the tainting of butter by imported Scandinavian spruce (*Picea excelsa*) boxes are numerous, accounting in part for the reduced importations of shooks as compared with last year. In so far as it displaces the Swedish container, the expanding use of the "Saranac" wire-bound white-pine (*Podocarpus dacrydioides*) box constructed of  $\frac{1}{4}$  in. material is a welcome development, although inferior in carrying-qualities to the standard white-pine box with  $\frac{5}{8}$  in. ends and  $\frac{1}{2}$  in. sides, which is preferred by all official dairying authorities both in New Zealand and in Great Britain as the butter-box *par excellence*.

Curtailement of overseas trade-extension work appears inevitable unless local producers are successful in reducing costs and selling-prices to a world-parity basis. The value of most export grades of silver-beech (*Nothofagus Menziesii*), tawa (*Beilschmiedia tawa*), rimu (*Dacrydium cupressinum*), and matai (*Podocarpus spicatus*) on the British markets is about 3s. per cubic foot, equal to £1 5s. per 100 ft. b.m., which returns to the producer only about 10s. per 100 ft. b.m. f.o.r. mill. Special products, of course, command higher prices, with a corresponding return to the New Zealand operator, but the business is only in small parcels. The seasoning and grading of tawa for export present serious problems, which must be solved before any substantial trade can be developed in this species.

Of the field studies in progress, major interest attaches to the development of kiln-drying schedules for white-pine (*Podocarpus dacrydioides*), large quantities of which are being dried in a recently installed commercial kiln of the most modern type. Tentative results show that ordinary