

kiln-dried timber, and by the application of or sealing filling coats (shellac, paraffin wax polish, &c.), to *all* surfaces of furniture parts so as to prevent the powder-post borers from laying their eggs.

More attention is being given to the durable beech species, apart from their uses for sleepers, fence-posts, bridge timbers, poles, and pole blocks. Small quantities of red beech have been going into housing and, in a few instances into industrial and house flooring.

A number of other industrial inquiries have been concerned with kaikawaka for boat planking and fireproof doors, silver beech for bobbins and flooring, manuka for smokers' pipes, imported teak for churns, tawa for skewers, and substitute timbers for kauri for numerous applications.

83. *Timber Mechanics*.—Tests on air-dry material of thirty-year-old loblolly pine, ranging from 12 in. to 18 in. D.B.H., were completed, and a report prepared on the physical and mechanical properties of green material. It has been ascertained that the variation of strength properties with height in tree is less than with insignis pine of similar age.

Green values for some properties of the two species are compared, as follows:—

	Insignis Pine, C. and D. Bolts (Five Trees).	Loblolly Pine C. and D. Bolts (Three Trees).
Growth rings, per inch	2 $\frac{3}{4}$	3 $\frac{3}{4}$
Specific gravity (weight oven dry, volume green)	0.385	0.314
Shrinkage (green to oven dry) (percentage based on green dimensions):—		
Volumetric	9.8	16.9
Radial	3.0	2.5
Tangential	6.0	5.6
Modulus of rupture in bending (pounds per square inch) ..	5,870	4,530
Modulus of elasticity in bending (1,000 lb. per square inch) ..	1,060	860
Maximum compressive stress parallel to grain (pounds per square inch)	2,590	2,060

Testing was continued with the Denison toughness machine on both indigenous and exotic timbers.

84. *Box-testing*.—Specifications have been completed for nine local-trade fruit-cases. In approving these cases for general use, the Fruit Case Committee has taken into consideration their re-use value and stock timber sizes from which the shooks can be cut with least wastage.

85. *Wood Technology*.—A further study of the New Zealand beech species is in progress, as the extending use of these timbers has resulted in the submission of samples for identification from localities not covered by previous studies. Substantial variation in specific gravity, as well as in anatomical features, frequently makes differentiation of the species difficult. A suggestion made by the Railways Department that timber of the durable species may be distinguished by a simple chemical test is being investigated.

A key for the identification of the New Zealand *Dacrydium* species on the basis of microscopic features was published during the year.

Miscellaneous studies have covered the physical properties of material from exotic conifers and hardwoods from several localities, the equilibrium moisture content of thick veneers of several species, improved methods for the preparation of fire-hazard indication sticks, and ring counts of sections in connection with botanical investigations. Routine identifications of sixty specimens and numerous moisture-content tests for wood-using industries have been carried out. The identity of several of the Solomon Islands woods included in the collection made for the State Forest Service by the R.N.Z.A.F. has been tentatively established by the Division of Forest Products in Melbourne working in collaboration with field officers in the islands.