proportion of the country's flooring requirements from the better class of Building A timber. It is not proposed, however, to introduce a new grade into the national grading rules, but to achieve the desired objective by formulating a standard specification for the finished flooring.

80. *Structural Utilization.*—Prefabrication has figured so prominently in public discussions on the housing problem that it is necessary to emphasize that, taking even the most optimistic view, any attempt to apply it to much more than half of the national house-building programme would seriously disorganize the country's general timber economy, by creating an unbalanced avenue of use for various grades and qualities of building-timbers. With so much deferred maintenance now existing as a result of the five years of war, this dislocation might not become apparent for a short period, but would inevitably develop later.

The tendency towards small-panel construction for prefabrication, adversely reported on in last year's report, now appears to be arrested, and latest developments indicate that the essentials to partial prefabrication, as consistently advocated by the Forest Service over the last five years, are now likely to form the basis of future developments. They are as follows:—

(*a*) The adoption of orthodox construction carried out in indigenous sub-flooring and flooring timbers, although some units may be constructed with exotic flooring:

(*b*) The use of large wall, roof, and ceiling panels carried out in exotic framing which has been kiln dried, pre-cut, and preserved to make it virtually as good as heart kauri or heart totara:

(*c*) The use of heart or preserved rimu and matai for both flooring and weatherboarding, and of insignis-pine sheathing and sarking:

(*d*) The possible use of one-piece wall linings of structural insulating-board as an interior lining, with door and window openings cut to give an unbroken surface free of all joints, thus dispensing with the necessity for ugly battens, and giving an attractive flat surface suitable either for paints or wallpaper finish. By using one-piece wall linings in place of narrow panels, the localized shrinkage and swelling of structural insulation board at joints is eliminated and splitting of wallpaper avoided.

81. *Mill Studies.*—Sawing-costs for various diameter classes of exotic logs were studied at the Waipa Mill. In Southland a special investigation into the milling of silver-beech was undertaken to ascertain the possibility of judging the interior defects in logs from such visible indicators as fungal fruiting bodies, branch stubs, &c. The result has been disappointing, but more study is required before any final conclusion can be reached.

82. *Utilization of Minor Timbers.*—Under the ever-increasing pressure of war conditions more and more demands have been received for locally grown timbers as substitutes both for imported woods and for other materials not now available. *Inter alia*, success has been achieved in the substitution of black-maire both for lignum vitæ for caulking mauls for shipwork and for boxwood for buffing-blocks for instrument spindles; of silver-beech for walnut and ash as packing-blocks for airplane spars and for sycamore for hosiery shapes; of insignis-pine for metal and rubber water-bottle stoppers; and, as later discussed, of matai for silver-pine for bushings for barrel bung-holes.

83. *Timber Mechanics.*—Major interest attaches to the continued testing of insignis pine grown under forest conditions. Standard tests have been completed on Whakarewarewa green material, and a commencement made with the testing of the air-dry timber, the preliminary results indicating that, except in the case of very rapidly grown and young wood, its air-dry strength in both bending and compression is relatively high, having regard to its density. A small number of air-dry specimens of Australian white stringy-bark grown in the Little River district of Canterbury gave strength values superior to those of northern rata, one of the strongest of New Zealand timbers.

Of other exotic forest timbers tested, European larch gave the following results, comparable strength values for the same timber grown and tested by the same methods in England being shown in parentheses:—

Static bending—		
Modulus of rupture (pounds per square inch)—		
Green	7,460	(7,200)
Air dry (12 per cent. moisture content)	13,510	(12,600)
Modulus of elasticity (pounds per square inch)		
Green	1,322,000	(1,200,000)
Air dry (12 per cent. moisture content)	1,744,000	(1,510,000)
Compression parallel to grain—		
Maximum crushing strength (pounds per square inch)—		
Green	3,230	(3,520)
Air dry (12 per cent. moisture content)	7,070	(6,990)
Shearing strength parallel to grain (pounds per square inch)		
Green	820	(890)
Air dry (12 per cent. moisture content)	2,000	(1,410)

In connection with the extended manufacture of casein-bonded moisture-resistant plywood, extensive series of standard dry and wet tests have been made to ensure conformity