

was excessive. In this instance an edge-to-edge piled kiln stack was air-dried for over three months before kiln-drying; in future charges it must be recognized that reasonable air drying requires vertical flues—i.e., spaces between the boards in each course—which will ensure that the centre of the stack will have been seasoned to the same extent as the outsides. This general principle should be followed in all preliminary air-seasoning, which, while desirable for native softwoods, is essential for native hardwoods, with the exception that tawa and other species prone to rapid discoloration should be kiln-dried as soon as possible after sawing. It has been found necessary in giving advice on the kiln-drying of rewarewa to point out that boards containing the refractory core cannot be dried without excessive warping and that excessive tangential shrinkage makes it necessary for this species to be accurately quarter-sawn or flat-sawn to avoid diamonding.

Further experience at the Waipa Mill has shown that automatic ventilation has considerable value, especially for the efficient drying of the fast-drying exotic pine timbers. It is clear that kiln units designed for the drying of indigenous softwoods have insufficient heating surface, ventilator provision, and fan capacity for these fast-drying exotic timbers.

87. *Wood Preservation.*—Testing of wood preservatives against marine borer infestation was continued in co-operation with the Auckland Harbour Board. Test specimens were again examined during the year. After five years exposure, creosoted specimens of exotic species were sound and showed nil to slightly increased incidence of attack as compared with the condition the previous year. Attack had occurred by teredo and was evident mainly on the unsheathed transverse sections. Untreated control specimens of the same species had been completely destroyed. Of the untreated indigenous species (all heart timber), tawa, taraire, kauri, and miro were totally destroyed. Totara continued to show marked resistance to teredo attack, while attack by *Limnoria* was minor to moderate and had spread over the entire surface. The additional indigenous species containing both heartwood and sapwood, installed untreated, were also examined. After three and a quarter years' exposure, kauri specimens have been totally destroyed, while totara specimens have been attacked by *Limnoria*, extensively in the sapwood and moderately in the heartwood. Round bolts of tawa, taraire, and miro have been extensively attacked from surfaces where the bark had become detached while submerged in the water and are now in an unserviceable condition. White and red manuka (both with and without bark) after two years' exposure are relatively free from attack. Redwood and larch specimens immersed with bark intact are comparatively free from attack, and the bark is holding well. Specimens of these two species immersed untreated and debarked have been attacked quite extensively.

Rimu poles creosoted by the State Forest Service and installed by the Post and Telegraph Department during 1931 in Greymouth and Canterbury have been maintained under close observation. After seventeen years' service, 65 creosoted poles are perfectly sound while 2 show signs of decay. Of the creosoted poles none has failed, but an average life of only three years was obtained from untreated controls. Similar service tests with creosoted larch poles and crossarms are now being organized in co-operation with that Department.

An experimental pressure cylinder 26 in. in diameter by 8 ft. in length has been installed at Rotorua, and will be utilized in determining the susceptibility to treatment of the principal indigenous and exotic species and in investigating suitable treatment schedules for application on a commercial scale.

Further investigations have been made of the dipping of kiln-dried insignis-pine timber in an oil solvent preservative immediately after withdrawal from the kiln and before appreciable cooling of the timber had occurred. These investigations were extended to include 8 ft. lengths of 4 in. by 2 in. insignis pine which were immersed while hot for periods varying from ten to thirty minutes. The results were comparable