

average life of Australian hardwood poles is greater in the dry localities on the east coast of the South Island than in wetter and more humid districts. Crawford (2) confirms this statement, finding that the same species give a higher average life in the dry, far west of New South Wales than in the wetter coastal regions.

Decay is most active near the ground-line, where the wood is continually damp through contact with the wet ground. In damp clayey soils the decay extends only 2 ft. to 3 ft. below the surface, but in loose and sandy soils, where the air-supply is better, it may reach to depths of 5 ft. to 6 ft. Post-tops, joints in framed timbers, and other points where water collects also exhibit serious decay. In the presence of excessive moisture, however, decay cannot proceed, as illustrated by the kauri and silver-pine logs which are being recovered from swamps in which they have been buried for hundreds of years.

RELATIVE DURABILITY OF GREEN AND SEASONED TIMBER.

Hicks (3) and other authorities (4) report that the natural durability of untreated wood is slightly greater for timbers set green than for those placed after seasoning, a view which is supported by Shrimpton (1) as a result of his experience with poles in New Zealand. This may be explained by the fact that whatever the moisture content of the timber when first placed, that portion below the ground-line must ultimately come into equilibrium with the moisture content of the surrounding soil. By placing the post or timber when green, splits and checks will be largely eliminated at the ground-line, thus avoiding a condition favourable for decay.

PRINCIPLES OF WOOD-PRESERVATION.

In commercial timber-treating practice natural durability is improved by injecting antiseptics to poison the wood substance upon which the fungi live. Except in the case of a few porous woods it is impracticable to impregnate the wood throughout, it being the usual practice to create an outer protective envelope around the untreated interior wood. It is generally assumed that the increased durability due to any treatment will be in approximate ratio to the depth of penetration and to the amount and permanency of the preservative employed. Since it is difficult to treat the heart-wood of most timbers, the natural round post is the most satisfactory form of timber for treatment. Where the heart-wood is naturally durable, however, split and sawn posts containing a proportion of sap-wood may be treated with advantage. The financial saving due to a preservative treatment is obviously greater when applied to a non-durable wood than to a durable timber.

The important wood-preservatives fall into two general classes—coal- and wood-tar derivatives, such as creosote, carbolineum, &c.; and mineral salts, such as zinc chloride, sodium fluoride, &c. The latter, being water-soluble salts, are not suitable for fencing-post work in New Zealand unless employed in conjunction with creosote oil, crude petroleum, &c., which will resist the natural tendency of our rainfall to leach out the preservative and render the wood non-resistant to decay. The two factors governing the value of