As the sap-wood of all trees contains a large amount of protoplasm, starch, and other essential plant-foods, it exhibits poor durability, seldom exceeding four years when in contact with the ground. The natural durability of heart-wood varies with the timber. It is considered to be determined largely by the presence of certain vital oils which prevent the growth of fungi.

DURABILITY OF NEW ZEALAND TIMBERS.

New Zealand has been fortunate in its supplies of durable fencing-timbers. Totara ranks first in importance, but is becoming increasingly scarce. Table 1 has been prepared to show the average range of life of the principal commercial timbers, including both native and introduced woods. The figures given refer to posts cut from the heart-wood of sound and healthy mature trees grown and used under average conditions of soil and climate. The woods in Class 6 are generally used for temporary fences only.

Table 1.—Average Range of Life of the Principal Fencing-timbers used in New Zealand.

Class 1 : Over 30 years—Puriri, silver-pine, totara, broadleaf.
Class 2 : 20 to 30 years—Kowhai, hinau, kawaka, black-locust.
Class 3 : 15 to 20 years—Hard red and black beech, matai, jarrah.
Class 4 : 10 to 15 years—Maire, kauri, *Eucalyptus amygdalina, E. botryoides, E. coriacea, E. eugenioides, E. Macarthuri, E. viminalis, E. obliqua, E. globulus.*
Class 5 : 5 to 10 years—Pukatea, rata, manuka, mangeao, mountain-beech, tanekaha, tawhero, kamahi.
Class 6 : Under 5 years—Rimu, silver-beech, white-pine, rewarewa, taraire, tawa, miro. All thinnings and immature timber of the eucalypts in Class 4, and of pines, spruces, larches, and softwoods usually planted.

Users of posts are warned against drawing rash conclusions from these summarized data. The conditions of growth, the quality of the timber, and the conditions of use to which the figures apply must all be considered in studying the table.

CONDITIONS OF GROWTH.

Posts cut from immature and fast-growing trees generally exhibit little resistance to decay. The average range of life of even the durable species, such as ironbark, is only eight to twelve years. That of the remaining woods is reduced proportionately.

Late autumn and winter are the best seasons for felling trees. The timber then dries slowly and evenly, minimizing splits and checks, in which insects and fungi usually commence their destructive work. Insects are noticeably absent at this time of the year, and by late spring the wood will have dried sufficiently to resist the attack of these pests. Almost equal durability is obtainable from wood cut at other seasons of the year, but rigid precautions must be observed if excessive splitting and checking, and insect and fungal attack, are to be avoided.

INFLUENCE OF CLIMATE AND SOIL.

Climatic conditions in New Zealand are conducive to decay throughout the year. The climate is typically a temperate one. Except in a few localities there is a copious and well-distributed rainfall and a high atmospheric humidity, both of which produce conditions favourable to decay. Shrimpton (1) reports that the