

or two; orchard crops require a few years to establish the basis for an annual or biennial return of crops; but a wood crop does not become useful until many years' growth have been accumulated.

Every year a new layer of wood is laid on over the layers that have been formed before, increasing the wood plant in height and circumference. The crop is ready for harvest when a sufficient number of annual growth is accumulated to make wood of useful size. This differs according to the use to which the material is to be put.

A five to ten years' growth of some kinds might suffice for hop and bean poles, for barrel hoops, canes and the like; at 15 to 20 years the crop might well furnish in addition some fence posts, mine props, and poles, as well as firewood; and so on till milling timber is obtained at any age from 30 to 100 years, depending upon the species, location and other factors.

The establishment of artificial forests, therefore, lends itself particularly to this method of utilisation, and has been adopted in New Zealand for many years. The many thinnings obtained from our plantations have been utilised in this manner and are a source of revenue which cannot be neglected. Mention may perhaps be made at this juncture of the Agricultural Department's wattle plantations at Te Kauwhata in the lower Waikato district. After stripping for tanning bark, the trees are felled and sold either as fuel, fence posts or in some cases as mine timbers.

Dealing, however, with the final product of the forest, many problems of utilisation present themselves. Enormous wastages occur at every stage of conversion of the growing tree into saleable timber, and it is doubtful if there is any other source of natural wealth so wastefully exploited. The value of any stand of timber is often considerably reduced by attacks of fires and disease, and to the occurrence of defective or twisted logs and over-mature trees which it is not economical to remove for conversion at the mill. Logging operations also account for a large percentage of waste, although various methods of utilisation are available to reduce this to a reasonable figure. The actual conversion of the log into sawn timber involves a still further wastage, in many cases amounting to as much as 50 per cent., so that finally only about 25 per cent. of the available ligneous material per acre reaches the consumer. Since this last factor is influenced to a great extent by the consumer several methods by which this may be reduced should be stressed.

The average consumer, in selecting timber for a dwelling, barn, fence, or any other purpose will, if his means permit, take a quality that is many times far beyond his actual requirements and which will cost him, and not only him, but others who select this quality, more than it would if he had selected a quality to meet no more than necessity demanded.

It is a fundamental principle of economics that the closeness of timber utilisation is in direct proportion to the stumpage values. The advance in prices of timber during the past 20 years has compelled the use of more and more of the lower grades, thus tending to a greater degree of forest conservation now than formerly, but we have not yet reached the point where nearly all of the useful valuable timber of the lower grades will be accepted by the consumer.

Another of the means by which the public could increase the utilisation of timber is through the acceptance of short and odd lengths of timber where now only longer and even lengths are taken; if building timber were as closely utilised as factory timber, if the contractor or builder ordered the material for a house in the lengths actually required, odd lengths and short lengths would find a ready market and much waste could be saved.

A large amount of timber in New Zealand is utilised in the form of dimension—that is, for box, joinery, turnery, lath and furniture work, and not as plank timber, but nevertheless the enormously wasteful process of securing the necessary dimension for the manufacture of the products of the wood using industries by first manufacturing plank and then manufacturing dimension from plank is everywhere almost universal. The difficulty involved is that no attempt at standardisation of dimension stock has been made, that is to say, the factory man or intermediate user of the timber prefers rather to buy ordinary merchantable timber and cut it to his own size, than to procure standard dimension stock from the sawmiller. It is a significant fact that the National Association of Wood Turners of the United States of America has recently taken up this very important and vital work of standardising the principal elements of the dimension requirements of manufacturer of wood products.

Much waste could be utilised if consumers of timber knew where suitable sizes were available, and also if millers knew where sizes that could be cut from their waste were in demand. The Forest Service at Washington, United States of America, has organised a waste wood exchange for this purpose. It sends out quarterly to members of this exchange circulars, in which buyers or sellers set out their requirements or supplies. This scheme has been found very successful, and will be tried in New Zealand in the near future.

The low utilisation of our New Zealand forests may be attributed in many instances to a lack of knowledge concerning the specialised uses of many of our native timbers. These are now, however, becoming more generally known as a result of the educative work by the Forest Service amongst the wood using industries.

*(To be Continued.)*