

The Nature of Wood

One could spend a long time discussing the nature and properties of wood itself, and its probable future uses, but I will endeavour to be brief. Basically three things can be done with wood. It can be used as such (i.e., with its structure intact); it can be broken down by mechanical or chemical processes into its constituent fibres and reconstituted in the form of paper or other fibre products; or by hydrolysis it can form the base for a wide range of chemical products.

Wood in its raw state is a remarkable substance. The English author, C. E. Montague, once wrote "how he loved the stuff, as strong as iron, as carvable as cheese. What genius could have conceived so delicious a union of opposites, if by some disaster, it had not been fashioned by nature". He was speaking of ice, not wood, but his remarks are still apposite. What genius could have conceived the opposites of lightness and strength, of ease of working and rigidity, of general utility and beauty? Wood has all of these properties and others as well: good heat and sound insulation, low electrical conductivity, resilience, physical durability, great compressive strength and stiffness. It has, of course, some major defects, but most of these are susceptible to correction; thus, durability in the face of biological hazards can be imparted by chemical means, as can fire resistance; dimensional instability can be reduced or eliminated by such techniques as kiln drying, the application of protective coats and cross banding in the reassembly of wood pieces. The latter principle can be adopted in the manufacture of products such as plywood, particle board and glued laminations to overcome the other main disadvantage of wood, the fact that its strength is largely unidirectional. Careful design will also minimise this disadvantage.

Processed Wood

Furthermore, wood can be impregnated with resins, with or without pressure, or can be compressed with or without impregnation, to impart a further wide range of desirable properties and to enable its use, singly or in combination with other materials, for a further wide range of structural and commodity purposes. Wood in its natural or semi-natural state, i.e., with its oriented strength unimpaired, is likely to survive on sheer merit as a basic raw material. The peoples of 2062 will use it and will need large quantities of it.

They will need even larger quantities of wood in the second major type of use as fibre board, container board and paper in its various forms. We are entering into an era of pulp and paper products—newsprint and other printing papers, wrapping paper and multi-wall paper bags, cardboard and corrugated boards for the packaging industry, tissues, writing papers, wood textiles, and a host of others. In civilisation as we know it today, there is a strong positive correlation between standard of living and per capita consumption of pulp and paper; and there is no reason to assume that this correlation will not hold good in the future. Certainly paper can be made from other materials, notably from bamboo and from rice straw, bagasse and other agricultural residues; but for the reason already indicated wood is likely to remain its basic source. There can be no doubt that future generations will need pulp and paper products and will need them to an increasing degree, and there can be no doubt also that coniferous forests will continue to be by far the largest source of supply.

The quantities required in the future will be phenomenal. I will not attempt to prophesy them but will merely ask you to consider the facts; that whereas the annual per capita consumption of paper in U.S.A. is 403lb, in Japan it is 87lb, and in India it is only 2.4lb; that as the Asian races become literate and become industrialised their consumption of paper will rocket, as it did in Japan when these events occurred; and that well before the year 2062 the population of the