The Principal Species of Wood: Their Characteristic Properties, by Charles H. (Charles THE PRINCIPAL SPECIES OF WOOD:

THEIR CHARACTERISTIC PROPERTIES.

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PREFACE.

The following is a brief untechnical presentation of general

features characterizing economically important species of wood. It is the result of notes originally brought together from many already existing sources and later augmented, and verified so far as possible for the present use, by personal observation. The work of preparation has not been as simple as the result would indicate, and although great care has been taken to check each fact, errors do no doubt exist, although it is not believed that there are important ones.

Engineers while writing upon woods have, save exceptionally, emphasized strength beyond most other properties. Other works for expert foresters or botanists are of necessity too special, voluminous, fragmental, or technical for the casual student. Some popular books on trees, as distinct from woods, are available. The present form is distinct from these and is intended for those who are not foresters or botanists, but who use woods or desire knowledge of their distinguishing properties. Allusions to trees, historical and other references, aside from those directly regarding woods, are made for completeness and in order to mark, distinguish, or separate the species.

Acknowledgments are particularly due to the publications of the U. S. Division of Forestry, to Prof. Sargent's studies as set forth in Vol. IX of the Tenth U. S. Census, to Dr. B. E. Fernow, to Mr. Raphael G. Zon for suggestions and for technical revision, to the *Northwestern Lumberman* and other trade journals, to many dealers, who have been uniform in their courtesy, and incidentally to Mr. Morris K. Jesup, whose magnificent collection of woods at the New York Museum of Natural History has been available to the writer as to others. These, with other sources of information acknowledged by the writer, and suggested to others, are suitably arranged in the following list. Of the 155 illustrations, 138 are original, the drawings having been prepared under the supervision of the writer from actual specimens by Mr. Irving T. Worthly of Cornell University and several students of New York University, and the photographs by Mr. John Hopfengartner, Jr., of Westchester, New York City. Other illustrations are, so far as

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MEDICINAL PROPERTIES.

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Books particularly useful to beginners are in italics. Names are repeated when books could not be particularly classed under one heading. Also see foot-notes under subjects in questions.

THE PRINCIPAL SPECIES OF WOOD.

INTRODUCTION.

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A tree has been defined as a woody plant that produces naturally and in its native place one principal erect stem with a definite

crown of foliage. A plant thus attaining to the dignity of a tree is said to be arborescent.[1]

There are nearly five hundred distinct species of trees growing in the United States,[2] as well as many others peculiar to other countries, yet the great mass of wood everywhere utilized is derived from comparatively few of them.[3] Many woods will be more generally employed as their valuable properties become more familiar or as the supplies of wood now utilized continue to diminish.

The same tree is often called by different common names in different places. Nearly thirty names are thus applied to the longleaf pine (*Pinus palustris*). Such confusion can be avoided only by regarding the recognized botanical nomenclature.

The botanical name of a plant consists of two principal terms denoting genus and species. Quercus, for example, is

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the generic name including all species of oak. Alba, rubra, and others are specific names denoting the said species. Quercus alba and Quercus rubra are completed terms. Genera are not fixed but differ with authorities, so that the abbreviated name of the botanist responsible for the classification adopted is often added, as Quercus alba Linn. and Ulmus fulva Michx.

A species is a collection of individuals that might well have sprung from some single root. A genus is a collection of related species. Genera are gathered into families. Families and genera differ with authorities. A variety includes individuals differing slightly from accepted species. Its name when existing is part of the specific name. "Quercus robur var. pedunculata" specifies a variety (pedunculata) of "red" or strong (robur) oak (Quercus). A variety of one botanist is sometimes a distinct species of another.

The size and character of the trunk, and the range, locality, or distribution of the tree, have much to do with the utility of the wood, since large or perfect timbers cannot be derived from species characterized by small or crooked trees, and since wood is always more used if it is widely distributed so as to be easily

available.[4]

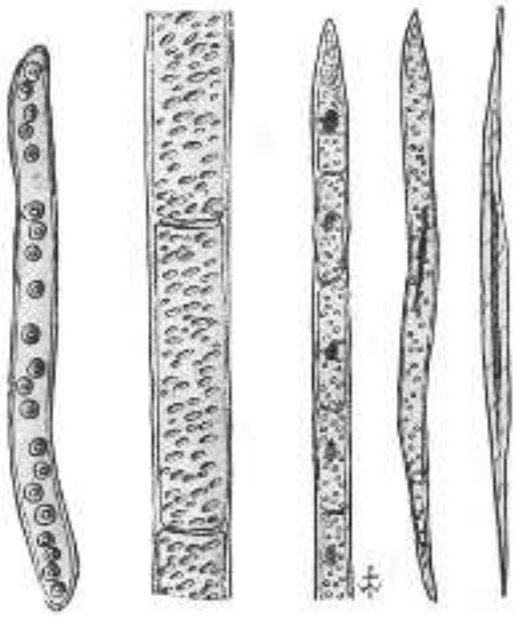

Fig. 1.—Some Wood Elements.

Wood is made up of cell-structures; as, the true fibre, which originates from several cells; the tracheid (tra-ke-id), which originates from one; the vessel, which is a short, wide tube joined vertically end to end with others of its kind; the pith-ray; the resin-duct, and others,—all of which are often popularly referred to as fibres.

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The character and the arrangement of cell-structures differ with species. Wood is hard, soft, light, heavy, tough, porous, elastic, or otherwise, because of these differences. Appearance is affected, and woods may be distinguished from one another, because of this fact.[5]

Most wood is used in "construction," that is, in mines, railways, houses, and ships, where demand is for size or quantity, and where finish and appearance amount to but little. Much wood is used in decoration and furniture, where appearance, appropriateness, and finish are called for; but these woods, although much in evidence, are infinitely less in quantity than those employed in construction. Some wood is required for implements, turnery, carvings, and small-piece work, where size is secondary and where qualities such