Identifying Wood

Accurate results with simple tools

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CHAPTER ONE

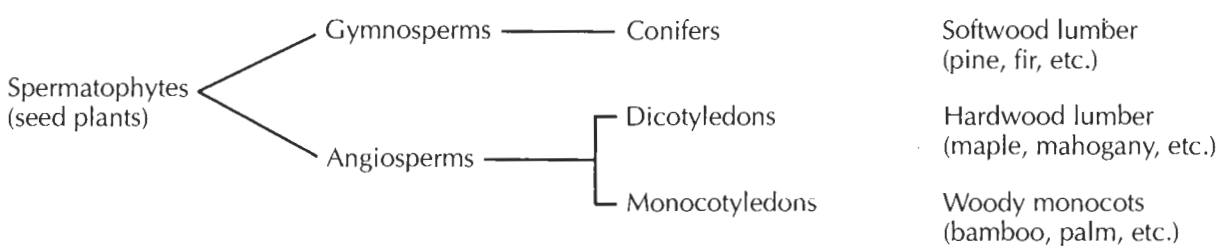
THE CLASSIFICATION AND NAMING OF WOODS

The practice of classifying and assigning names to living things is called **taxonomy**. It begins by placing all organisms in either the plant or animal **kingdom**. The plant kingdom is subdivided into major divisions or **phyla** (singular **phylum**). The division *Spermatophyta*, which includes all seed plants, is separated into two broad groups based on seed type. One group is the **gymnosperms**, which have exposed seeds; the other is the **angiosperms**, whose seeds are encapsulated. These groups are further divided into **orders, families, genera** (singular **genus**) and **species** (singular also **species**).

CLASSIFICATION OF EASTERN WHITE PINE
(*Pinus strobus*)

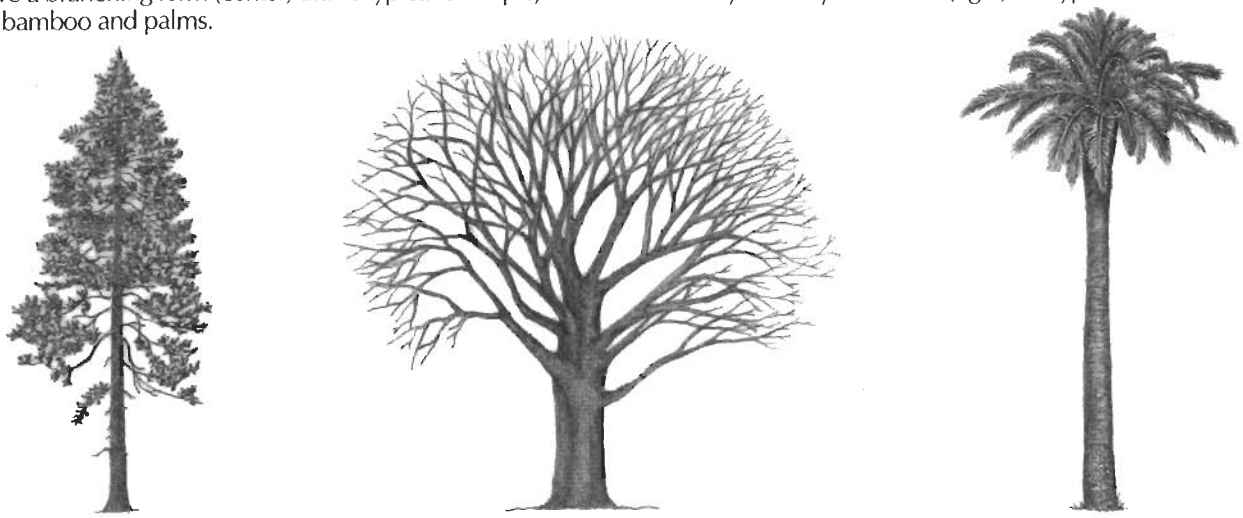
Kingdom: Plant
Division (or phylum): Spermatophyta
Subdivision (or class): Gymnospermae
Order: Coniferales
Family: Pinaceae
Genus: *Pinus*
Species: *strobus*

CLASSIFICATION OF THE SPERMATOPHYTES
Within the plant kingdom, the seed plants, or spermatophytes, include three major groups that yield woody material.



STEM FORMS OF SOFTWOODS, HARDWOODS AND MONOCOTS

Evergreen conifers such as pines, spruces and firs typically have an excurrent form (left). Deciduous hardwoods have a branching form (center) that is typical of maple, walnut and cherry. Woody monocots (right) are typified by bamboo and palms.



Gymnosperms and Angiosperms

Gymnosperms include all trees that yield the lumber we call **softwoods**. Softwoods fall within four families of the order *Coniferales,* more commonly called **conifers**. They are characterized by needlelike or scalelike foliage, which is usually evergreen. They have an **excurrent** form, which means that there is a dominant main stem (trunk) with lateral side branches. You have probably seen this form in pines, spruces, firs, hemlocks and cedars.

The conifers include the largest living plants — the sequoias — and the oldest plants — the bristlecone pines. Table 1.1 on pp. 4-6 lists the conifers that are included later in the softwood-identification chapter.

Angiosperms are separated into the **monocotyledons**, or **monocots,** and **dicotyledons**, or **dicots**. Monocots have one initial seed leaf, dicots have two. Dicots include such familiar plants as string beans and roses; they also include all tree-sized plants that yield hardwood lumber — oak, birch and mahogany, for example. Hardwood trees are typically **dendritic** or **deliquescent,** that is, characterized by branching or rebranching of the main stem.

Dicot trees usually have broad-leafed foliage, and in temperate zones they are mainly **deciduous,** losing their foliage during winter dormancy. Table 1.1 lists the dicot woods that are covered later in the hardwood-identification chapter.

Although we generally think of wood as coming from the conifers of the gymnosperms — softwoods — or the dicots of the angiosperms — hardwoods — monocots also produce important woody material. Most monocots, especially in temperate zones, are familiar to us as grasses or corn. However, particularly in warmer climates, monocots can attain large size and produce woody stems in vine or tree form. Although their cell structure and arrangement are distinctly different from those seen in hardwoods and softwoods, their overall size and the nature of their woody material make them functionally useful. Some of these monocots are bamboo, palm and rattan, which we see in a variety of products, including furniture, fishing rods, utensils and jewelry. The brief discussion of monocots in Appendix I on pp. 183-199 will help you recognize these woods when you run across them.

Species

A species comprises individual organisms that are similar in form and structure and that can interbreed to produce fertile offspring. For identification purposes we are not generally satisfied calling a tree by its generic name alone — birch, for example. Rather, we want a specific name: yellow birch, sweet birch, river birch, white birch, gray birch.

Scientific Names

The obvious objective in identifying an unknown sample of wood is to call it by its correct name. The fact that you have three categories of names to choose from is hardly a blessing. Scientific names, common names and trade names are used interchangeably even though common names and trade names are often inappropriate or misleading. A single common name can denote several species. A common name for a tree in a foreign country may differ from the name for the same tree in the United States, and, of course, a common name in a different lan-

guage may be completely unrecognizable. Some trade names are deliberately designed to be deceptive for marketing advantage. Fortunately, because there is one, and only one, scientific name for each plant, scientific nomenclature helps avoid confusion.

The renowned Swedish botanist Carl Linnaeus (1707-1778) adopted a system of binomial (two-name) nomenclature that forms the basis for our present system of naming plants. Because the scientific names in this system are in Latinized form, they are italicized (in handwritten or typed work, they are underlined to indicate italics). The first name designates the genus (the generic name) and the second, the species (the specific name). The genus always begins with a capital letter, the species with a lowercase letter. For example, the scientific name for the tree species commonly called eastern white pine is *Pinus strobus*. Where the genus is repeated or clearly understood it is sometimes abbreviated: *P. strobus* for eastern white pine, *P. lambertiana* for sugar pine.

Generally, these names are proposed by botanists or taxonomists and then adopted by the scientific community. Thus, a complete species designation includes the name of the author in addition to genus and species. The names of well-known authors are abbreviated. For example, eastern white pine is formally written *Pinus strobus* L., the appended initial for Linnaeus. Rock elm, *Ulmus thomasii* Sarg., credits Charles Sprague Sargent. However, author designation is used only in more formal or highly technical writing; in more routine work it is now usually omitted.

Once accepted, scientific names are usually not changed. Occasionally, however, new scientific evidence calls for a name change. It takes time for this new name to become fully established, which often causes confusion. It is helpful in such cases to indicate either the former or proposed name in parentheses with an "equals" sign immediately following or beneath the name that is in current use. For example, yellow birch is *Betula alleghaniensis* (= *B. lutea*); afrormosia is Pericopsis elata (= *Afrormosia elata*). To determine which name is current, consult a regularly updated handbook such as the U.S. Department of Agriculture's *Checklist of United States Trees, Native and Naturalized* (see the Bibliography on pp. 212-215 for the full listing).

Binomial nomenclature is simple in principle, but the obvious challenge is getting used to the Latin names. But this task is not as imposing as it might initially appear. The common genera will be encountered repeatedly and will soon become familiar. The second name — the species — usually refers to the author or another person, the place the plant was discovered or a distinguishing feature, which also makes it easy to remember.

Common Names

In contrast with the precision of scientific names, common names can be confusing, inconsistent and misleading.

Common names (also called vernacular or local names) often note the area in which the wood is found, as in California laurel and Oregon myrtle. The tree's most obvious visual characteristics are evident in designations like bigleaf maple, blue spruce, cottonwood, trembling aspen and gray birch. Fruits are noted in butternut, apple and black cherry; favored sites in river birch, swamp maple and mountain hemlock. The tree's properties are denoted by ironwood and rock maple, and its ultimate use by arrow wood, spoonwood and pencil cedar.

Common names are notoriously variable from region to region. It seems that every country has a redwood, a whitewood and an ironwood. A single species may have different names in different localities. In the United States *Platanus occidentalis* is sycamore; in England it is American plane. England's sycamore is *Acer pseudoplatanus*. We call *Pinus strobus* eastern white pine; in England it is yellow pine. The English call both Norway spruce *(Picea abies)* and Norway fir *(Abies alba)* "whitewood."

The examples go on. *Liriodendron tulipifera,* whose preferred common name is yellow-poplar, is also called tuliptree, tulip poplar, white-poplar or poplar; the preferred common name of the lumber from this tree is also yellow poplar (no hyphen), but it is known in various localities as whitewood, tulipwood, tulip poplar, hickory poplar, white poplar or simply poplar or popple. But poplar and popple correctly refer to a completely different wood — cottonwood or aspen in the genus *Populus*. Moreover, tulipwood is a South American rosewood— *Dalbergia*—and numerous species share the name whitewood.

Fortunately, most checklists designate a **principal** or **preferred common name** (also referred to as a standard or pilot name) for both tree and wood. In most cases this name uses two words, one word representing the genus, the other the species, as in black walnut, American elm and shagbark hickory. Less commonly a single term such as butternut, tamarack or hackberry has been adopted based on well-established traditional use.

Some common names are hyphenated or joined together as compound words, while others are not. Common names are compounded to make it clear that the two words, if taken separately, would be somewhat misleading. For example redcedar (compounded) is really a juniper, not a red cedar. Brief, simple compounds are written as a single word: redcedar, tanoak. But somewhat longer compound names are hyphenated as an aid in reading and pronunciation: yellow-poplar, white-cedar, Osage-orange.

Trade Names

Trade or commercial names are those used to designate lumber or other forms of wood in commerce. Some woods simply retain their common tree name — red alder, sycamore, yellow poplar, Sitka spruce, eastern white pine — or a shortened version — beech for American beech, cherry for black cherry. Place of origin occasionally creeps into the trade name. For example, bigleaf maple becomes Oregon maple, western white pine is sold as Idaho white pine.

It is quite common for more than one species to be included under a single lumber designation, either because the woods are functionally equivalent and can be used interchangeably, or be-

cause once cut into lumber they are very difficult or impossible to tell apart. Examples of such groups are western fir, southern yellow pine, red oak and African mahogany. The so-called hem-fir group often used in building now include western hemlock and firs; white woods designates a group which may include any of 13 western pines, hemlocks, firs and spruces.

Conversely, the wood of a single species may be segregated into more than one commercial category, resulting in more than one trade name. For example, the sapwood (outer wood) of sugar maple is sold as white maple, while wood of this species with the popular bird's-eye figure is sold as bird's-eye maple. The sapwood of sweetgum is sapgum; its heartwood (inner wood) is sometimes sold as figured gum or redgum. Baldcypress with a disease known as brown pocket rot is called pecky cypress.

Unfortunately, trade names have been invented that borrow names from more popular or desirable species to help market a lesser-known wood. This is probably the explanation for Philippine mahogany, used for species of *Shorea, Parashorea* and *Pentacme*. In truth, these are not mahoganies at all; the only genera usually accepted as genuine mahogany are *Khaya* and *Swietenia*.

To assure consistency and to avoid confusion, it is good practice to consult a standard or recognized authority. I relied on the *Checklist of United States Trees, Native and Naturalized* as my source for names of American species used in this book, and I recommend it as a guide to scientific names, principal common names and commercial names for lumber. Its guidelines governing scientific and common names are well worth reading. For foreign woods, I use British Standards publication BS 881 & 589 (a single booklet). More information on this and other helpful references can be found in the Bibiliography on pp. 212-215.

TABLE 1.1:
WOODS IDENTIFIED IN THIS BOOK

Scientific Name	Common Name
I. SOFTWOODS	
Abies	(true) fir
A. alba	Norway fir
A. amabilis	Pacific silver fir
A. balsamea	balsam fir
A. concolor	white fir
A. grandis	grand fir
A. lasiocarpa	subalpine fir
A. magnifica	California red fir
A. procera	noble fir
Chamaecyparis	white-cedar
C. lawsoniana	Port-Orford-cedar
C. nootkatensis	Alaska-cedar
C. thyoides	Atlantic white-cedar
Juniperus virginiana	eastern redcedar
Larix	larch
L. decidua	European larch
L. laricina	tamarack
L. occidentalis	western larch
Libocedrus decurrens	incense-cedar
Picea	spruce
P. abies	Norway spruce
P. engelmannii	Engelmann spruce
P. glauca	white spruce
P. mariana	black spruce
P. rubens	red spruce
P. sitchensis	Sitka spruce
Pinus	pine
P. albicaulis	whitebark pine
P. contorta	lodgepole pine
P. echinata	shortleaf pine
P. elliottii	slash pine
P. flexilis	limber pine
P. lambertiana	sugar pine
P. monticola	western white pine
P. palustris	longleaf pine
P. ponderosa	ponderosa pine
P. resinosa	red pine
P. rigida	pitch pine
P. strobus	eastern white pine
P. sylvestris	Scots pine
P. taeda	loblolly pine
Pseudotsuga menziesii	Douglas-fir
Sequoia sempervirens	redwood

Sequoiadendron giganteum	giant sequoia
Taxodium distichum	baldcypress
Taxus	yew
T. baccata	European yew
T. brevifolia	Pacific yew
Thuja	thuja
T. occidentalis	northern white-cedar
T. plicata	western redcedar
Tsuga	hemlock
T. canadensis	eastern hemlock
T. heterophylla	western hemlock

II. HARDWOODS

Acer	maple
A. campestre	field maple
A. macrophyllum	bigleaf maple
A. negundo	boxelder
A. nigrum	black maple
A. platanoides	Norway maple
A. pseudoplatanus	sycamore (British)
A. rubrum	red maple
A. saccharinum	silver maple
A. saccharum	sugar maple
Aesculus	buckeye, horsechestnut
A. glabra	Ohio buckeye
A. hippocastanum	horsechestnut
A. octandra	yellow buckeye
Alnus	alder
A. glutinosa	common alder
A. incana	grey alder
A. rubra	red alder
Betula	birch
B. alleghaniensis	yellow birch
B. lenta	sweet birch
B. papyrifera	paper birch
B. pendula	European (silver) birch
B. pubescens	European (white) birch
Carpinus caroliniana	American hornbeam
Carya	(true) hickory
C. glabra	pignut hickory
C. laciniosa	shellbark hickory
C. ovata	shagbark hickory
C. tomentosa	mockernut hickory
Carya	pecan hickory
C. aquatica	water hickory
C. cordiformis	bitternut hickory
C. illinoensis	pecan
C. myristiciformis	nutmeg hickory

Castanea	chestnut
C. dentata	American chestnut
C. sativa	sweet chestnut
Castanopsis chrysophylla	giant chinkapin
Catalpa	catalpa
C. bignonioides	southern catalpa
C. speciosa	northern catalpa
Celtis	hackberry, sugarberry
C. laevigata	sugarberry
C. occidentalis	hackberry
Cornus	dogwood
C. florida	flowering dogwood
C. nuttallii	Pacific dogwood
Diospyros virginiana	common persimmon
Fagus	beech
F. grandifolia	American beech
F. sylvatica	European beech
Fraxinus	ash
F. americana	white ash
F. excelsior	European ash
F. latifolia	Oregon ash
F. nigra	black ash
F. pennsylvanica	green ash
Gleditsia triacanthos	honeylocust
Gymnocladus dioicus	Kentucky coffeetree
Ilex	holly
I. aquifolium	English holly
I. opaca	American holly
Juglans	walnut, butternut
J. californica	southern California walnut
J. cinerea	butternut
J. hindsii	northern California walnut
J. nigra	black walnut
J. regia	European walnut
Liquidambar styraciflua	sweetgum
Liriodendron tulipifera	yellow-poplar
Lithocarpus densiflorus	tanoak
Maclura pomifera	Osage-orange

(continued on next page)

TABLE 1.1 (continued)

Scientific Name	Common Name
Magnolia	cucumbertree, magnolia
M. acuminata	cucumbertree
M. grandiflora	southern magnolia
***Malus* spp.**	apple
Morus rubra	red mulberry
Nyssa sylvatica	black tupelo
Ostrya virginiana	eastern hophornbeam
Platanus	sycamore, plane
P. occidentalis	sycamore
P. acerifolia	London plane
Populus	aspen, cottonwood, poplar
P. alba	white poplar
P. balsamifera	balsam poplar
P. canescens	gray poplar
P. deltoides	eastern cottonwood
P. grandidentata	bigtooth aspen
P. heterophylla	swamp cottonwood
P. nigra	European black poplar
P. tremula	European aspen
P. tremuloides	quaking aspen
P. trichocarpa	black cottonwood
Prunus	cherry
P. avium	European cherry
P. serotina	black cherry
***Pyrus* spp.**	pear
Quercus	oak
Q. alba	white oak
Q. bicolor	swamp white oak
Q. coccinea	scarlet oak
Q. falcata	southern red oak
Q. garryana	Oregon white oak
Q. kelloggii	California black oak
Q. lyrata	overcup oak
Q. macrocarpa	bur oak
Q. palustris	pin oak
Q. petraea	sessile oak
Q. prinus	chestnut oak
Q. robur	European oak
Q. rubra	northern red oak
Q. stellata	post oak
Q. velutina	black oak
Q. virginiana	live oak
Rhus typhina	staghorn sumac
Robinia pseudoacacia	black locust
Salix	willow
S. alba	white willow
S. nigra	black willow
Sassafras albidum	sassafras
Tilia	basswood, lime
T. americana	American basswood
T. heterophylla	white basswood
T. vulgaris	European lime
Ulmus	elm
U. alata	winged elm
U. americana	American elm
U. crassifolia	cedar elm
U. glabra	wych elm
U. procera	English elm
U. rubra	slippery elm
U. thomasii	rock elm
Umbellularia californica	California-laurel

III. TROPICAL HARDWOODS

Acacia koa	koa
***Cedrela* spp.**	Spanish-cedar
Chlorophora excelsa	iroko
Chloroxylon swietenia	Ceylon satinwood
Cybistax donnell-smithii	primavera
Dalbergia fructescens* var. *tomentosa	Brazilian tulipwood
Dalbergia latifolia	Indian rosewood
Dalbergia stevensonii	Honduras rosewood
Dicorynia guianensis	basralocus
***Diospyros* spp.**	ebony
Dyera costulata	jelutong
Entandrophragma cylindricum	sapele
Entandrophragma utile	utile
Gonystylus macrophyllum	ramin
***Guaiacum* spp.**	lignumvitae
***Khaya* spp.**	African mahogany
Lophira alata	ekki
Mansonia altissima	mansonia
Ochroma pyramidale	balsa
***Peltogyne* spp.**	purpleheart
Pericopsis elata	afrormosia
Phoebe porosa	imbuia
***Pterocarpus* spp.**	padauk
***Shorea* spp.**	white lauan
***Shorea* spp.**	yellow meranti
***Swietenia* spp.**	Central American mahogany
Tectona grandis	teak
Terminalia superba	korina
Triplochiton scleroxylon	obeche
Turraeanthus africanus	avodire