

America's Age of Wood

CHARLES VAN RAVENSWAAY

FROM the beginnings of European settlement in North America until the growth of modern industry in the nineteenth century, wood was the raw material most frequently used for fuel, construction, furniture, and countless other articles. In many of these products wood substituted for other materials traditionally used in Europe.

This use of wood was a practical solution to the limitations of a new country. In particular it met the needs of the inhabitants, many of whom were farmers, or hunters, or trappers, and who were dependent upon their own skills in providing their basic necessities. In the forest they found resources of great variety which could be readily converted to their needs with the simplest of tools. The abundance of wood also sustained artisans in the growing towns and villages, particularly those who supplied the buildings, ships, furniture, and other objects in which wood was the primary material. It also provided the enormous amount of fuel required in the homes and in the infant mills and forges, the containers essential in agriculture and for the milling and fishing industries, as well as in other occupations. This technology, born of necessity and the existence of the forests, by accenting the individual encouraged inventiveness along with the development of practical skills. It helped shape the American character and provided the basis for the nation's later industrial growth.*

The development of this technology was possible because

*The spelling of the Latin and Common Names of the trees has been taken from Elbert L. Little, Jr., *Check List Of Native And Naturalized Trees in the United States. Prepared under the direction of the Forest Service Tree and Range Plant Name Committee, Agriculture Handbook No. 41 . . . Forest Service* (Washington: 1953).

of the availability of wood almost everywhere, and because the 1,027¹ species of trees found in North America provided lumber with a range of physical qualities unavailable in the Old World.² An American house carpenter, a shipbuilder, or a maker of household wares could supply his needs from woods that varied widely in hardness, weight, flexibility, and resistance to rot, warping, or insects; and lent themselves to splitting, sawing, or carving. Trees also provided dyes, substitutes for rope, foods and medicines, and even poisons for stunning fish.

Nearly every immigrant had at least some knowledge of wood and some familiarity with handling woodworking tools. although the availability and uses of the material varied greatly throughout Western Europe. Wood was also an essential raw material in the Indian cultures; and the Indian's knowledge of its uses was acquired by the settlers. Very soon a technology of wood began to evolve, both aided and encumbered by European memories. These included ancient folk beliefs about the proper season in which to cut lumber, and about accursed trees like the *Pinus Banksiana* L., which could be destroyed only with fire.³

When settlement moved into the interior and contact was made with different Indian cultures and new species of trees, the uses of woods steadily became more diversified as craftsmen sought to meet the growing demands of the continental market. In the Ohio and Mississippi valleys the most desirable cabinet woods, such as walnut and cherry, were found

¹This total represents the latest census (1953) and includes 78 naturalized species, many of them introduced at an early period, Little, *Native and Naturalized Trees*, p. 19.

²America is more favoured, says Monsieur Michaux, in the variety of her forest trees than France. The number of sorts of American forest trees, whose growth amounts to thirty feet at least, which Monsieur Michaux describes, is 137, of which ninety-five are employed in *the arts*.

³In France, there are only thirty-seven which grow to that size, of which eighteen only are found in their forests, and seven only of these are employed in civil and maritime architecture.' John Lowell, 'Remarks on the Gradual Diminution of the Forests of Massachusetts,' *The Massachusetts Agricultural Repository and Journal*, V (1819), 38.

³A belief current 'in some parts of the country' during the latter part of the 19th century. Charles Sprague Sargent, *The Silva of North America* (Boston and New York, 1897), XI, 149, note 4.

in greater size and abundance than along the coast. Until almost destroyed by overcutting, walnut was used for everything from fence rails to house building. Species native to the interior added to the profusion of wood resources. Rafinesque⁴ reported that yellowwood (*Cladrastis lutea* [Michx. f.] K. Koch) made excellent canoes, as did the cucumbertree⁵ (*Magnolia acuminata* L.), a fine-grained wood of considerable strength used in the nineteenth century for delicate ballroom chairs as well as water pumps. The Kentucky coffeetree (*Gymnocladia dioica* [L.] K. Koch) was also called 'mahogany,' indicating its several uses. Housewives esteemed its crushed and sweetened leaves as a fly poison.⁶ By the early nineteenth century, America had developed a technology of wood more sophisticated than that of the Old World.

At no time during its long period of dominance did the continent's wood technology become standardized. The great variety of trees made for many regional differences. The changing economy and the changing needs and aspirations of the individual forced constant adaptation. The status symbol on the frontier was a hewn log house with a wooden floor (in contrast to the improvident log cabin), although within a few years it became a frame, stone, or brick house. Immigrants continued to reintroduce European practices, either those of the conservative peasantry or those of contemporary urbanites. The Swedes brought horizontal log construction into the Delaware Valley in the seventeenth century. This was repeated two centuries later by the Polish, East German, and Scandinavian immigrants settling in the Middle West. The Alpine bank barns, and the half-timbered houses which some of these people also built repeated the same techniques and designs used much earlier in Pennsylvania by Germanic settlers.

⁴Constantine S. Rafinesque, *Medical Flora; or, Manual of the Medical Botany of the United States of North America* (Philadelphia, 1828-1830), II, 210.

⁵Daniel J. Browne, *The Sylva Americana* (Boston, 1832), p. 207.

⁶Charles S. Newhall, *The Trees of Northeastern America* (New York and London, 1890), p. 190.

Everything in America seemed to demand new solutions. Even the familiar woodworking tools many immigrants brought with them were inadequate in the new environment. One of the great technical achievements of this new culture was the American felling axe, a design gradually evolved by anonymous but creative blacksmiths.⁷ In time the axe acquired a head with proper weight and balance and with a resilient handle subtly curved to meet the rugged demands of skilled woodsmen. Similarly, American adaptations of European cabinetmaking tools were often preferred to European imports, or to those that artisans brought with them.⁸ Because labor was always in short supply and the demand for products constantly expanding, the mechanization of many routine operations was begun using the abundant sources of water for power. Up-and-down sawmills appeared first. Later the circular saw greatly speeded up production. Who invented it, and when, is apparently unknown, but a full-scale working model was made at New Lebanon, New York, in 1792.⁹ By the mid-nineteenth century circular saws were widely used to meet the insatiable demands of the lumber market.

During the long period of westward movement and the steady depletion of the forests, the supply and availability of

⁷Henry Knaus (born Pennsylvania, Oct. 22, 1771), a blacksmith, emigrated with his family to Missouri in 1817, settling in Franklin, Howard County, where he became widely known for his skill in making axes. A contemporary writer states that the forests of Howard County were cleared 'by the manly exertions of its inhabitants, in active appliance of the celebrated Knaus axes, manufactured at Franklin by the old gentleman and his sons, who work cast-steel with great mechanical skill, in the forging and finish of all edge-tools, from a razor up to a broad-axe.' National Historical Company, *History of Howard and Cooper Counties, Missouri* (St. Louis, 1883), p. 391; Alphonso Wetmore, *Gazetteer of the State of Missouri* (St. Louis, 1837), p. 80.

⁸Adolph Greef (born Kettwig, Germany, 1807), who emigrated to St. Louis in 1833 and found work there as a cabinetmaker, explained that he 'had to buy an entirely new set of tools which were very expensive. I just had to have them for the German tools were a constant source of ridicule on the part of the other workmen.' Letter from Greef to his family in Germany, St. Louis, Dec. 16, 1833, quoted by William G. Bek, 'The Followers of Duden,' *Missouri Historical Review*, XIV (1920), 217.

⁹Gifts to the New York State Agricultural Society Museum during 1870 included 'a circular saw 12½ inches in diameter, said to have been forged in 1792, by Benjamin Bruce, of New Lebanon, N.Y.,' and presented by George M. Wickersham, Shaker Village, New Lebanon, N.Y. *Transactions of the New York State Agricultural Society for the Year 1870* (Albany, 1871), p. 595.

lumber changed too. Steamboats and railroads came to hasten the process of change. By the 1850s most of the Michigan black walnut was being shipped to the furniture factories of Boston. The sawmills of Chicago and St. Louis supplied prefabricated buildings for the new towns of the Great Plains. When mines in the Ohio and Mississippi valleys made coal and common metals cheap and readily available, the dependence on wood for firewood, fences, many machine parts, bridges, roofing, tools, and other products disappeared. The continuing use of immense quantities of lumber for railroad ties, house construction, and the growing paper industry are aspects of the industrial age, and not pertinent here.

At the beginning of the seventeenth century, all of North America was forested except for the Great Plains and the deserts of the West and the Southwest. The forests within the present area of the United States are grouped in two major divisions because of the species distinctive to each.¹⁰ These are the Atlantic forest, extending from the coast to the eastern slopes of the Rockies, and the Pacific forest. This paper is limited to the former.

Within the Atlantic forest great differences in climate, altitude, soil, and the effect of the oceans and the Great Lakes, had encouraged the development of many varied species and affected their distribution and growth.¹¹ Along the ridges of

¹⁰Charles Sprague Sargent, *Report on the Forests of North America (Exclusive of Mexico)*, U.S. Census Bureau (Washington, 1884,) p. 12.

¹¹Sargent, *Report*, pp. 3, 6, divided the Atlantic Forest into six divisions: (1) *Northern Forest*, has a sub-arctic climate, with a limited number of species of stunted growth and little economic use; predominately white and black spruce. (2) *Northern Pine Belt*, in which the white pine (*P. strobus* L.) is the characteristic species. Also important are: black spruce, hemlock, basswood, black and white ash, sugar maple, the birches, elms, and white-cedar (*Thuja occidentalis* L.). (3) *Southern Maritime Pine Belt*, dominated by the long-leaved pine (*P. palustris* Mill.); also, various other pines, the live oak, palmetto, gums, water oaks, hickories, ashes, and southern cypress. (4) *Deciduous Forest of the Mississippi Basin and Atlantic Plain*. Predominately a deciduous forest in which geologic features in certain areas favor the growth of pines. The region is generally characterized by broad-leaved species; oaks, hickories, walnuts, magnolias, ashes, cherry, tulip, chestnut, hawthorns, Osage-orange, red-cedar, southern and yellow pine, beech, and others. Here many species 'attain their greatest development and value.' (5) *Semi-tropical Forest of Florida*. This has many arborescent species of the Atlantic

the Alleghenies, northern species like the eastern white pine (*Pinus strobus* L.) grow abundantly on the mountains of the Deep South. The warmer climate along the shores of southern New England encourages southern species to grow above their normal range. These include the sweetbay (*Magnolia virginiana* L.) and the American holly (*Ilex opaca* Ait.). Often, because of some unusual local condition, small stands of economically useful trees flourished in unexpected localities.¹² Although many species could survive over wide areas, their most favorable growth was more restricted.

The quality of wood in an individual tree is also affected by its particular growth conditions, such as the 'curled,' 'landscape,' 'mountain,' or 'blistered' grains found in certain specimens of the red maple (*Acer rubrum* L.).¹³ A white pine (*Pinus strobus* L.) that had grown slowly within a deep forest produced an almost buttery grain. This lumber, much favored by wood carvers, came to be known as 'pumpkin pine' in New England, and 'cork pine' in Michigan, Wisconsin, and Tennessee.

The descriptions of those who saw the unspoiled forest give us tantalizing glimpses of its grandeur. The areas in which deciduous trees predominated were known as 'green woods,' perhaps because when the sun was overhead 'a quiet, chaste and mellow light is admitted through the veil of pale

forest as well as a group of West Indian species, among which are: the mahogany, mastic, royalpalm, Jamaica dogwood, seagrape, and manchineel. (6) *Mexican Forest of South Texas*. Although species of the Atlantic basin grow south beyond the Rio Grande in the river valleys, the generally arid region is distinctive for its 'chaparral (dense and often impenetrable thickets of thorny shrubs and small trees).' Sargent reported the mesquite to be the most characteristic and valuable species.

¹²Such local stands influenced the type of wood used by neighboring craftsmen in contrast to regional practices. In 1846, George B. Emerson mentioned that the ponds in Plymouth, Massachusetts, provided favorable growth conditions for the pitch pine (*P. rigida* Mill.), which grew there to a height of seventy feet, whereas in less favorable locations in Massachusetts its normal height was 'commonly forty or fifty feet high, and one or two feet in diameter at base.' George B. Emerson, *A Report on the Trees and Shrubs Growing Naturally in the Forests of Massachusetts . . . The Commissioners on the Zoological and Botanical Survey of the State* (Boston, 1846), p. 66.

¹³Described by Emerson, *Report*, 5th ed., (Boston, 1894), II, 555.

green and semitransparent foliage.' By contrast the 'pine woods' admitted only a 'faint and dubious twilight,' and 'as regards the loneliness and melancholy of these regions, summer and winter are nearly alike.'¹⁴ Everywhere the forest ceiling was at such a height that, as John Bartram said in his travels through western New York, 'there is no seeing which way the clouds drive nor which way the wind sets, and it seems almost as if the sun had never shown on the ground since creation.'¹⁵ Because of the dense shade, neither plants nor shrubs grew beneath the trees; and as the trunks were widely spaced, a traveler could see a stag 'a hundred or a hundred and fifty fathoms off,' Francois André Michaux noted in Kentucky.¹⁶ Elsewhere he speaks of 'the profound silence that reigns in these woods,' and suggests the overwhelming sense of being enclosed, 'the security of the place.'¹⁷ Trees of immense size grew almost everywhere. In the upper parts of New Hampshire and Maine, the white pines and spruce towered above the surrounding trees like a forest on top of a forest.¹⁸ Along the Ohio River, where the hardwoods grew more luxuriantly than along the East Coast, Michaux measured a sycamore (*Platanus occidentalis* L.) forty-seven feet in circumference. The hollow trunk of a similar tree in Missouri was made into a law office by the eccentric Judge Nathaniel Beverley Tucker.

¹⁴N. A., 'The Forests of America,' in *The Farmers' Register* (Petersburg, Va.), VI (1838), 518, 519.

¹⁵July 1743, describing the forest on 'the nearest Branch of the Susquehannah river to that of the Onondaga,' *John and William Bartram's America*, ed. Helen G. Cruickshank (The Natural History Library Anchor Books, Garden City, 1961), p. 35.

¹⁶F. A. Michaux, *Travels to the West of the Alleghany Mountains* (London, 1805), p. 168.

¹⁷*Ibid.*, p. 141.

¹⁸Edwin James, comp., *Account of an Expedition from Pittsburgh to the Rocky Mountains* (Philadelphia, 1823), I, 14, 15. 'The great white or Wemoth pine . . . forms a striking feature in the forest scenery of Vermont, New Hampshire, and some parts of Canada, and New York; rising by nearly half its elevation above the summits of the other trees, and resembling, like the palms of the tropics . . . "a forest planted upon another forest." The sighing of the wind in the tops of these trees, resembles the scarce audible murmurings of a distant water-fall, and adds greatly to the impression of solemnity produced by the gloom and silence of the pine forest.'

Throughout the eastern half of the continent, the forest growth was so continuous and so uniform that any break in the canopy attracted attention and, following settlement, a descriptive name. Those 'openings' formed by water included the marshes and bogs of New England, the swamps or 'bay-swamps' of the Southeast, and the bayous of Louisiana. Other types of openings consisted of meadows, a combination of trees and meadow, or uniform stands of trees of the same species. These were named 'savannas,' 'pine' or 'oak barrens,' or simply 'barrens,' as well as 'glades,' 'plains,' and 'intervals.' In the upper Middle West Frenchmen called the meadows 'prairies,' beyond which began the Great Plains.

Many of these openings seem to have been the result of forest fires, or of insects killing species predominate in certain areas, or a combination of both. We know, however, that many of them had been formed by the Indians through annual burnings to encourage the increase of game by providing forage lacking in the forest, and to open fields for cultivation. The practice was continued by farmers well into the twentieth century in areas where open grazing persisted. Why the Great Plains were treeless has never been satisfactorily explained, for soil and rainfall were adequate for tree growth throughout much of the area. Although the spring and autumn burnings have generally been given as the reason, such additional factors were involved as the level topography that provided few natural barriers to the spread of fire, periods of drought and strong winds, and the fact that the grasses had greater resistance to fire than saplings.¹⁹

¹⁹ What originally formed these treeless areas before the Indians began their annual burnings has been speculated upon by many writers during the past century and a half. The information they present, and their various arguments, are too involved to discuss here. In general it has been assumed that these areas were originally cleared of trees by fires from summer storms, and that they had been maintained by the burnings of the Indians—a theory that leaves too many questions unanswered. A great variety of reasons for the burnings were given at different periods, such as the early seventeenth-century explanation of Thomas Morton (quoted by Slade, *Horticulture*, p. 50), that without this clearing of underbrush 'the people would not be able in any wise to pass through the country out of a beaten path.' Generally it appears that the Indians used

Except for these annual burnings, the Indians, unlike the European settlers, did little to alter the forests or the natural distribution of the trees. It is true that the Indian planted the Spaniard's peach throughout much of the present United States before 1600, and it grew in such abundance that early botanists thought it native to America. The Indians also planted wild plums about their villages, bringing seed of some of the species from great distances, and perhaps red mulberries (*Morus rubra* L.) of which they were very fond.²⁰ Other useful trees grew so abundantly everywhere that they had no need to plant species from other regions. These supplied food (including maple sugar), beverages, dyes, medicines, gums and resins, and materials for building their huts and fences, for making weapons, canoes, and household articles.

Indian names for trees adopted by the settlers include the persimmon (*Diospyros* L.), Catalpa, and the dahoon, or yaupon (*Ilex cassine* L.) of the southeastern coastal region, a holly whose leaves are still used for making a tea. Usually, however, the settlers gave the trees new names. Some were European names for similar species, or trees which seemed to resemble those of Europe, such as 'sycamore.'²¹ Others were suggested

the burnings to increase the amount of game which needed the forage that came up after the fires; settlers continued them for that reason, and also because they believed the fires destroyed snakes and insects of various kinds, including the flies that attacked their livestock during the summer. Perhaps many fires were set simply because of the drama and excitement they provided. Featherstonhough, in describing his tour through the Ozark region, pointed out that in those areas where the soil was poor and the plant growth weak, constant cropping by buffalo and other animals could have maintained them as meadows. As is explained above, not all these openings were devoid of trees. The relatively small clearings east of the Mississippi could have been caused by an entirely different set of circumstances than those forming the prairies and plains of the Middle and Far West. See Sargent, *Report*, p. 5; G. W. Featherstonhaugh, *Geological Report of an Examination Made in 1834, of the Elevated Country between the Missouri and Red Rivers . . . Printed by order of the House of Representatives* (Washington, 1835), p. 76.

²⁰ U. P. Hedrick, *A History of Horticulture in America to 1860* (New York, 1950), pp. 19, 20.

²¹ Miles Standish found near Plymouth in November 1620, 'great oaks, but not very thick pines, walnuts, beech, ash, birch, hazel, holly, aspen, sassafras in abundance, and vines every where, cherry trees, and many others which we know not,' D. D. Slade, *The Evolution of Horticulture in New England* (New York, 1893), p. 59, quoting from Young's *Chronicles of the Pilgrims*, p. 133. Standish's list suggests how quickly the

by some characteristic of the bark, blossom, or seed pod, or the wood. Spanish, French, Dutch, Swedish, and English settlers developed their own vocabularies and some of these words have survived, often so corrupted in spelling and pronunciation as to disguise their origins. By the late eighteenth century this nomenclature was almost unintelligible. With the spread of the frontiers the confusion multiplied. In time the white pine of New England (*Pinus strobus* L.) accumulated some twenty-seven common names of record, not to mention the 'white pines' that were not of this species. Other trees were given such unlikely names as 'Balm of Gilead,' 'bleeding Heart,' 'Bluet,' 'Bull Bay,' 'Cow Licks,' and even 'Tremble' and 'Stopper.'²² Botanists such as Francois André Michaux, and enthusiastic botanical amateurs like William Cobbett, sought to collect and identify these names. Others voiced practical complaints. In 1817 John Lowell pointed out that the practice of arbitrarily naming trees 'introduces a confusion into conversation and even into contracts, which is very inconvenient.' To illustrate his point he cited a New Hampshire carpenter who referred to larch (*Larix laricina* [Du Roi] K. Koch) as 'juniper,' a common name that still persists for the larch, and still perplexes.²³ Further confusion was provided by the shipbuilders who developed their own names, as did the lumber merchants both here and abroad. Even if no deceit was intended, the practice made it very difficult for the uninitiated to know what he was buying, as indeed is true today.

When farms replaced the forests along the coast, rural families there began to forget what they had known about the forest because it was no longer essential to them. By the

settlers gave Old World names to similar, or apparently similar, species found here. Often names, given in error, have persisted, such as the New England use of 'walnut' for hickory, and 'sycamore' for the *Platanus occidentalis* L., which is quite different from the English sycamore (*Acer pseudoplatanus*).

²² George B. Sudworth, *Check List of the Forest Trees of the United States*, Bulletin No. 17, U.S. Department of Agriculture, Division of Forestry (Washington, 1898).

²³ Lowell, 'Remarks,' p. 40.

1840s many farmers and mechanics in Massachusetts could identify only the trees and lumber available in their immediate localities; and according to G. F. Emerson, they frequently confused these, particularly the various oaks.²⁴ From such evidence it would seem that many communities developed their own traditional uses of local woods. Seaport towns, however, were provided with lumber from other regions by the lively coastal trade, and the trade in turn was stimulated by the shipbuilders in their constant search for rot-resistant timbers.

Only on the receding frontier did forest living remain a familiar way of life, and knowledge of the forest resources an essential part of the education of every young man. Mrs. Anne Grant, during her visit to Albany in the 1750s, speaks of the 'native American, familiar from childhood with the productions and inhabitants of the woods It is inconceivable,' she said, 'how well these young travellers taught by their Indian friends, and the experimental knowledge of their fathers, understood every soil and its productions. A boy of twelve years old would astonish you with his accurate knowledge of plants, their properties, and their relation to the soil and to each other.'²⁵

Like other European visitors, or settlers moving west from the open farmlands of the coastal areas, Mrs. Grant was repelled 'by the solitude so vast, and silence so profound,' of the forests. A farmer from the 'land of steady habits' spoke of being buried in these forests, and the formidable task of 'working one's self out into the light of day, and the rays of the glorious sun.'²⁶ We can only speculate how successive generations living in the forest were emotionally shaped by their world of shadows and stillness, of remoteness from their kind, but its effect was profound. Most of them 'have not the

²⁴ Emerson, *Report* (1846), p. 18.

²⁵ Mrs. [Anne McVickar] Grant, *Memoirs of an American Lady* (New York, 1846), pp. 48, 49.

²⁶ A Backwoodsman, 'The Settler in a New Country,' in *The Cultivator* (Albany, N.Y.), New Ser., I (1844), 234.

least idea that there is any part of the country entirely open,' Michaux commented during his travels through Kentucky, 'and still less that they could inhabit it.'²⁷ Yet many of them, despite their acceptance of forest life and their dependence upon it, continued to battle against it with fire and axe. 'The forests themselves appeared so vast in proportion to any probable demand for fuel, and wood for building and other purposes,' John Lowell commented in 1816, 'that no man dreamt that the day would arrive, in which the descendants might regret the improvident profusion of their ancestors.'²⁸

It is difficult today to comprehend the immense amount of lumber required to support America's Age of Wood, and the even larger amount destroyed to clear farm lands. We are familiar with the use of wood for constructing houses, bridges, and ships; for making furniture and other domestic articles, but we must also remember that most of the timber was used for such mundane purposes as firewood, fencing, and for making potash and pearlsh.

As commerce developed, the coastal shipping of lumber, and the export of it to the West Indies and Europe, soon became a major factor in the colonial trade.²⁹ Before the close

²⁷ Michaux, *Travels*, p. 148.

²⁸ Lowell, 'Remarks,' p. 34.

²⁹ Peter Kalm noted in 1748 Philadelphia's profitable export trade with the West Indies. 'For thither the inhabitants ship almost every day a quantity of flour, butter, meat and other victuals, timber, planks, and the like . . . Philadelphians send both West Indian goods and their own productions to England; the latter comprise all sorts of woods, especially black walnut and oak planks for ships, ships ready built, iron, hides, and tar.' *Peter Kalm's Travels in North America*, ed. Adolph B. Benson (New York, 1937), I, 26, 27. During the 1760s Bernard Romans noted that the exports from Florida included: 'Pitch, Tar, Squared timber, Cedar posts and plank, Cypress & pine boards, Plank of various woods, Scantling, Staves and heading, Shingles, Sassafras, Hoops, Myrtlewax, Pacan-nuts,' much of this destined for the West Indies. Bernard Romans, *A Concise Natural History of East and West Florida* (Floridiana Facsimile & Reprint Series, Gainesville, 1962), pp. 202, 203. W. Winterbotham, *An Historical, Geographical, Commercial, and Philosophical View of the United States of America* (New York, 1796), II, 160-165, 107, summarizes the export of forest products from Massachusetts for the year Oct. 1, 1790-Sept. 31, 1791. They include: Sassafras root; frames of boats, houses, windows and doors; household furniture, tables, desks, bureaus, sofas, chests, Windsor and rush chairs; nuts; essence of spruce; myrtle wax; staves and headings, shingles, shooks and casks, and laths; large quantities of ships parts such as 'masts, bowsprits, booms, spars, handspikes, pumps, boxes and brakes,

of the eighteenth century, when settlement had spread from the seacoast into the back country, and when lumber became an increasingly valuable product, the rivers were used to move great quantities of lumber to market.³⁰ Much of it was taken to the seaports. In addition, during the last decades of the eighteenth century, white pine and other useful woods from the forests of the Pittsburgh region began to be floated down the Ohio and Mississippi rivers to the growing towns along the way, and principally to New Orleans. Value was added to the timber for export, and its bulk reduced, by converting the logs into boards, planks, rafters, various parts of ships, shingles, clapboards, barrel staves, hoops, and even house frames.

By the mid-eighteenth century, shortages of lumber began to be noticed along the East Coast. At Philadelphia in 1748, Peter Kalm learned from joiners that supplies of wild cherry and curled maple were becoming scarce.³¹ Fifty years later Moreau de St. Méry reported that firewood was as expensive in Philadelphia as in Europe, because the forests in the populated sections of the colony and along the navigable rivers had been depleted. 'Coal is already used in many towns and facto-

blocks, oars and rafters, trunnels, cedar and oak knees,' and 'carvings.' In addition, oak and pine boards, planks, and timber, scantling, ground oak bark, mast hoops, ox yokes, hoops and hop-poles. During the same year, twelve house frames were sent to the West Indies from the port of Piscataqua, New Hampshire; as well as an immense amount of other finished wooden articles, pine masts, clapboards, wagons, boats. The lumber exported included white, red, and black oak; maple, beech, black birch, white pine, ash, and hemlock. Obviously the export records for the Atlantic and Gulf ports, if available, would be of great value to the student of North America's Age of Wood.

³⁰For a detailed description of the lumbering activities in New Hampshire, the Lake Champlain region, and the area around Pittsburgh, about 1800, see: F. A. Michaux, *The North American Sylva* (Philadelphia, 1859), III, 130-135. The lumber trade between Pittsburgh and New Orleans is mentioned by James, *Account*, I, 14.

³¹*Kalm's Travels*, I, p. 220. 'The joiners say that among the trees of this country they use chiefly the black walnut, the wild cherry, and the curled maple. Of the black walnut (*Juglans nigra*) there is yet a sufficient quantity, but careless people are trying to destroy it, and some peasants even use it as fuel. The wood of the wild cherry tree (*Prunus Virginiana*) is very good, and looks exceedingly well; it has a yellow color, and the older the furniture is, which is made of it, the better it looks. But it is already scarce, for people cut it everywhere without replanting. The curled maple (*Acer rubrum*) is a species of the common red maple, and likewise very difficult to obtain.'

ries.³² Similar conditions existed in New York, Boston, and other of the new cities along the coast. Before 1814 some of the best timber used in Boston was imported from Georgia, a circumstance that offended both the pride and frugality of General Benjamin Lincoln.³³ But the profligate waste of timber continued, as John Drayton of South Carolina noted in lamenting that chestnut trees were being cut in the upper country only for making it easier to gather the nuts.

Before the end of the eighteenth century, forests near the heavily settled coastal region of New England and the Middle States had become so depleted that conservation and reforestation began to be advocated. Tench Coxe of Philadelphia spoke for the '*preservation and reproduction of our forests.*'³⁴ Somewhat later General Benjamin Lincoln wrote his dissertation on the need for such work, particularly with white oaks. In 1801 the Massachusetts Society for Promoting Agriculture offered a prize for successful reforestation efforts, but the award aroused little public interest.³⁵ The exploitation of the forests continued as lumbering moved to Michigan, Wisconsin, and other midwestern states, and then to the West Coast. Not until after the Civil War did forest conservation and reforestation begin to be practiced, with the first practical efforts being made in the new states of Minnesota and Nebraska, where the lack of timber hampered settlement. Before the end of the century a national program had been instituted.

With the destruction of the original forests, the ecology of the woodlands changed, as well as the natural distribution

³²Kenneth and Anna M. Roberts, *Moreau de St. Méry's American Journey [1798-1798]* (Garden City, 1947), p. 363.

³³General Benjamin Lincoln, 'Remarks on the Cultivation of the Oak,' Massachusetts Historical Society, *Collections*, 2d Ser., I (1814), 187-194.

³⁴Tench Coxe, *A View of the United States of America* (Philadelphia, 1794), p. 456.

³⁵[Massachusetts Agricultural Society], *Papers on Agriculture* (Boston, 1801), p. 7. 'Premiums . . . 9th. To the person who shall produce from seed, the best growth of thrifty trees, not less than 600 in the whole, and in the proportion of 2400 to the acre, of any of the following kinds of forest trees, viz. oak, ash, elm, sugar maple, beech, black or yellow birch, chestnut, walnut or hickory, *twenty-five dollars*; if all of oak, *fifty dollars*. Claim to be made on or before the 1st October, 1806.'

of many species. The original forest was the product of thousands of years of natural development. A forest once destroyed does not immediately restore itself with the same species; it must go through successive changes of growth in preparation for its ultimate form unless artificially encouraged by reforestation methods. Throughout much of the eastern half of the continent, where forests were cut over and then abandoned after a generation or two of farming, certain deciduous trees tended to replace the pines. In the hardwood forests of many areas, species once found in limited numbers tended to become common. In New England the birches, aspen, and other species of limited economic use took over abandoned pine lands. In the upper central Mississippi Valley, the eastern red cedar (*Juniperus virginiana* L.)—once rare—spread prolifically on sterile hills. Man himself has greatly altered the natural distribution. Settlers moving West took with them the black locust (*Robinia pseudoacacia* L.)³⁶ from the valleys of the Alleghenies, a rot-resistant wood useful for fence posts. Soon that tree was found everywhere. The Osage-orange (*Maclura pomifera* [Raf.] Schneid.), native to the Arkansas-Oklahoma area, from which the Osage Indians made their famous bows, became the most popular tree for farm hedges in the prairie and plains country, and quickly naturalized. Similarly, the catalpas, once of very limited range, were planted extensively both for ornamental use and for fence posts. Various trees introduced from Europe have naturalized in many areas, particularly some of the more economically useful willows, the golden-rain (*Koelreuteria paniculata*) tree from Asia, and others. Nowhere has the distribution of trees changed more radically than on the prairies and plains of the Middle and Far West. When settlement ended the

³⁶The species was originally limited, chiefly to the Alleghenies. William Cobbett tirelessly promoted the cultivation of the black locust (*Robinia pseudoacacia* L.), first during his two years' residence on Long Island (1817-1819), and after his return to England. His zeal made the tree popular in England for several decades, and 'the fashion crossed the Atlantic, and in the half century before the Civil War no other tree was so generally planted.' Trees taken by settlers to the Middle West quickly naturalized. Hedrick, *History*, p. 150.

annual burnings, native and imported species soon flourished where once only grasses could be seen to the horizon.

Further changes in the forests have come about through various diseases which have destroyed once common species, such as the chestnut blight and the Dutch elm disease of the twentieth century. However, Michaux noted the destruction of extensive forests of pine in the South in 1802, which he attributed to some insect.³⁷ The elms planted in Independence Square, Philadelphia, during the late eighteenth century were also killed by insects.³⁸ Whether such infestations occurred during the prehistoric period cannot be determined.

With these changes in the availability of woods, the farmer, village craftsman, or mill owner, requiring inexpensive woods in quantity, steadily substituted less desirable species for those formerly used. Woodenware once made from the burls of ash and other trees was turned out of second-growth soft woods by the small factories of Massachusetts and elsewhere during the nineteenth century. Curly-maple gunstocks were replaced by those of walnut. Makers of inexpensive furniture began using tulip poplar, sycamore, or cottonwood stained to imitate mahogany or cherry, or walnut stained to look like rosewood. They also sought to make painted furniture fashionable. As mechanization and industrial production replaced the crafts-

³⁷ 'Since the year 1804, extensive tracts of the finest Pines [Long-leaved pine, *P. palustris* Mill.] are seen covered only with dead trees. In 1802, I remarked a similar phenomenon among the Yellow Pines, in East Tennessee. This catastrophe is felt among the Scotch Firs which people the forest of the North of Europe, and is wrought by swarms of small insects, which . . . cause it to perish in the course of the year.' Michaux, *Sylva*, III, 110. Emerson, *Report* (1846), pp. 54, 286, comments on the various diseases affecting the oaks, pines, and elms.

³⁸ J. R., 'Shade Trees,' in *The Farmers' Cabinet* (Philadelphia), VI (1841), 46, quoting John Vaughan (1752-1841). Vaughan described how his father, Samuel Vaughan, planted American and English elms in Independence Square. 'As they grew up, however, they were found to be affected with a worm or caterpillar—said to have come originally from India—and which annually visited them, by which they were at length so much injured that it was found necessary to remove them, their bark being undermined from bottom to top, and coming off in long strips.' Vaughan said he investigated an elm near Philadelphia similarly infested, and decided that the insect had not come from India.

man, market places in the new age were flooded with objects generally shoddy in materials, design, and construction.

America's Age of Wood survived in isolated places until late in the nineteenth century because of the strength of the tradition, and because it was a technology which the individual could carry on with limited tools and his own skills, often in combination with farming, or hunting, or trapping. Log houses as well as other log buildings continued to be built; occasional Germanic workmen turned out wooden shoes for their neighbors or carved toys for children. Anglo-American craftsmen in some rural areas continued to make slat-back chairs, or to weave baskets from oak or ash splints, or to make other wooden products for local sale. With the passing of these craftsmen the Age of Wood disappeared, and with it a tradition reaching back into the beginnings of civilization. During the period of its supremacy, the lore about woods and the skills in working them had been passed from one generation to another orally and through apprenticeship, with almost none of the information or of the techniques being recorded. Much of the lore about woods and their uses was too commonplace, and urban craftsmen sought to preserve the secrets of their crafts. As a result much information has been lost and the incidental references are generally found in obscure sources. What remains is a vague memory and, most important of all, the surviving structures and objects which that age produced. These have a strong emotional and esthetic appeal to our time, and for reasons more varied and more subtle than we generally realize. Whatever the basis of their appeal may be, they have something to say which a great many people find important.

To interpret these products as expressions of the cultures that produced them requires knowledge drawn from many disciplines; from botanists, social and economic historians, as well as analytical scientists and historians of design. Identifying the woods used in them is an important element in the study but, as I have suggested, only the first step in determin-

ing what the use of a particular kind of wood in a particular piece actually means. That depends upon a knowledge of the original distribution of the species, the commerce in its lumber, and local preferences in its use, among others. If a piece is made of white pine, for example, that does not automatically guarantee it was made in New England, or even in the United States. Piecing together everything that an object can tell us is difficult and is understood and being pursued by only a limited number of scholars who appreciate the rewards which such studies offer. We have ignored for too long what these wooden buildings and objects—these silent children of the past—have to say. They, like the history of our changing environment, provide clues to the ‘whys’ of the American character and of American events that exist nowhere else.

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