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Fuel Wood Used in the United States 1630-1930

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HOW FUEL WOOD HELPED TO BUILD AMERICA

A hundred years ago, in all American families, fuel wood ranked in importance with food, clothing, and the rooftree over their heads. At that period a thousand cords of wood were burned for every ton of coal produced, and the principal users of coal were blacksmiths and workers in other industrial operations requiring high temperatures.

For the early settlers there were no fuel shortages. On the contrary they were often embarrassed by the quantity of wood available within short distances of their homes. It encumbered their lands, harbored their enemies, and offered a constant threat of conflagration. The lands commonly chosen for settlement were the clay loams of the valleys, on which the timber growth was likely to be principally hardwoods, the best of all wood fuels. A lone settler could work up his wood with the simplest of tools. But although the wood was at hand and free for the taking, it can hardly be said that the fuel was cheap. In man-hours it was expensive. Indeed, the outstanding objection to wood was the human labor involved in its preparation. Wood is hard and bulky. It is also heavy, especially when green, and most of the fuel-cutting job was hand work. A skilled axman could cut, split, and stack perhaps 1 cord of hardwood in a day. An unskilled man would require two or three times as long for the same results. Many farms needed as much as 20 cords a year. The cutting and hauling of fuel wood and subse-

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quent sawing, splitting, and filling of wood boxes was a burdensome chore on most of the older farms. A successful farmer needed husky sons for these chores as much as he needed horses.

But customs have changed, owing largely to the substitution of stoves for fireplaces and the subsequent shift from wood to coal and other combustibles. In our time wood is no longer the sole, or even the principal fuel in more than one-fifth of our homes. It is estimated that in the period 1920–29 the consumption of wood in fireplaces was only 15 percent of the total used in that decade. For every cord of wood consumed in homes or industries 8 tons of coal are used, besides large quantities of fuel oil and natural gas. Fuel-wood consumption has declined in every region. In the populous Northeast that decline began at the time of the Civil War, and the quantity used there in 1930 was only one-fifth of what it was at the peak of consumption, although the population had tripled. Even the farmers, who as a class are still the principal users of fuel wood, use it exclusively on probably not more than half of the farms, and mostly in the South.

So it has come about that the majority of Americans think of wood fuel in the same category with warming pans and spinning wheels, although many know it as a pleasant luxury, like candles on the dinner table.

From the earliest settlement until 1900 fuel wood was practically indispensable to all or a large part of the population. But there was nothing spectacular or romantic about it. No giant mills got into the picture—no billion-dollar industries. Just the patient labor of millions of sweating axmen. Our forests were "inexhaustible." Cordwood was about as plentiful as air. But nobody wrote about air—why write about firewood, or even record statistics about it? Hence, there is now as little written evidence as there is public appreciation of the past importance of wood fuel in the development of this country.

Nevertheless, from a long-range viewpoint fuel wood has been the most important of all products taken from American forests. Solely in bulk of timber consumed, fuel has accounted for more than half the total volume cut from our forests for commodity use, and more than twice as much as lumber, its nearest rival.

North America, in addition to its vast mineral wealth, was blessed with a temperate climate, ample rainfall, and fertile soils. Naturally under those conditions it was densely forested, and in the East particularly there was abundant store of hardwoods—the finest material for firewood, and for charcoal its derivative.

Possessing that timber, all things were possible to hardy and resolute men. Their most fundamental need was heat, both for the preparation of food and for protection against the cold. That need was supplied by wood fuel, readily available to every explorer and every settler on the frontier. Ample wood fuel made possible the colonization of remote farming lands at a time when coal was a curiosity and petroleum merely a remedy for rheumatism. The ashes of wood were available, not only as fertilizer, but as the basis of soap for household needs. These things made for a stable farming population. Timber supplied them with cabins also, but essential though these were, cabins came second in the grim business of

conquering a wilderness. The Indians seldom built wooden houses, but they always had fire. Some settlers lived in caves or in dugouts on the prairie. They had fire too, and they could not have occupied the land without it.

Fuel wood gave, not only heat, but charcoal, a magic chemical substance which made feasible the smelting of iron and hence the production of steel. The earliest settlements made provision for crude iron works, and all the smelting was done with charcoal. As recently as 1850 about half the iron made was still smelted with charcoal from the hardwoods of the East. Large sections of forest were cut for this purpose alone.[1]

Indirectly, fuel wood gave the pioneers their axes, knives, and rifle barrels, as well as plowshares, bits, wagon tires, nails, and tools. Tools opened mines, and coal made iron far more plentiful for stoves, steam engines, rails, machinery, and cannon. Even the powder to load the cannon came from charcoal.

Steam engines, especially on locomotives and steamboats, were fired solely or principally with wood fuel until the seventies, and for 20 years more this practice persisted in decreasing ratio. Railroads and steamers may have accounted for 125 million cords or more. An equal quantity may have been used in manufacturing plants and mining operations, though there is no reliable record of such consumption.

Thus fuel wood was the critical material which made possible rapid exploration and conquest, and also the beginnings of settlement, agriculture, and the vast industrial and commercial development that followed.

Other timber commodities, notably lumber, have rendered indispensable services in the building of America. With no wish to detract from their credit it may fairly be said that none of them can claim the distinctions outlined above for wood fuel.

In view of these facts, and the surprising lack of statistical and other record, the following statements and estimates may help to fill a gap in the general knowledge of the most important single drain upon American forests.

THE STOVE VERSUS THE FIREPLACE

Three-fourths of all the fuel wood used in our history was burned in domestic fireplaces, and these, although picturesque, were insatiable wasters of fuel. Many of the large fireplaces used backlogs of substantial diameter and 4 feet long, but unfortunately 80 percent of the heat went up the chimney. The huge brick oven that adjoined the kitchen fireplace required a large quantity of wood to bring it to the right temperature for baking.

An experiment conducted in Georgia is said to have shown that in order to maintain a prescribed temperature in a certain room it was necessary to burn 10 times as much wood in a fireplace as the

[1] The service rendered by charcoal is out of all proportion to the bulk of the wood required for making it. A necessarily crude estimate indicates that between 1800 and 1930 the wood used for charcoal (and in recent decades for all wood distillation) was about 100 million cords, or less than 1 percent of the fuel wood used. This quantity is not included in the fuel-wood estimates shown in table 2, because of the lack of data for distributing it to regions, or by decades.

amount required when using a good wood stove. Lacking insulation, the houses that depended on fireplaces, in spite of heavy fuel consumption, were very unevenly and poorly heated. Remote sleeping rooms had a deadly chill that compelled the use of nightcaps and the warming pan. Will Carleton remarks of conditions in a school room heated by a wood stove, probably about 1850:

The square stove it puffed and it thundered, and broke out in red-flaming sores,
Till the great iron quadruped trembled like a dog fierce to rush out-o'-doors;
White snow-flakes looked in at the windows; the gale pressed its lips to the cracks;
And the children's hot faces were streaming, the while they were freezing their backs.

The invention of the stove was a momentous event for the wood piles and the forests of America, for it greatly reduced the amount of fuel required. In 1744 Benjamin Franklin described an early and successful type of wood-burning stove, which still bears his name. It was later improved by Count Rumford, of New Hampshire, who made other important contributions to heating theory and practice. But it was not until near the middle of the century that the wood stove began to have an appreciable effect on fuel wood use.

In spite of their economy and convenience wood stoves came into use very slowly; for one reason, because of the sluggish development in manufactures.[2] Another reason was that the average family in colonial days was poor. The new stoves were somewhat expensive because of their method of manufacture and also because iron was scarce before 1830 even in the Northeast. The bulk of the people needed other things even more than they needed stoves. Merely on account of their weight there was no extensive manufacture and distribution of stoves (especially cooking stoves) until after the opening of the Erie and Champlain Canals (1820), the introduction of steamboats, and the first beginnings of railway travel (1830).

Thus, in the United States before 1825, the use of stoves, generally of the box pattern and very rude, was confined to shops and offices, public rooms, and churches in cities and large villages. In the country the churches were seldom warmed; the women carried foot stoves and the men protected their feet with stout overshoes called boxes.

After 1825 a greater number in cities and larger villages used the Franklin stove; but the rest of the people, and they were the great majority, still depended on the capacious fireplace, burning logs. It appears from several accounts[3] that even in the Northeast the general and widespread use of the wood stove did not come about much before 1840. In other regions the common use of stoves had to await the development of transportation or manufacture. Even now there is a lack of stoves in parts of some regions, not because they are unavailable, but because of poverty or the lack of progressive ideas. The gradual substitution of stoves for fireplaces in one region after

[2] The first commercial production of cast-iron stoves appears to have been near Lancaster, Pa. These were made of cast plates in the form of a box, and were set in the side or "jamb" of the kitchen fireplace and passed through the wall so as to present the heated back end in the adjoining room. These early models had no pipe or oven. From 1795 to 1835 no material progress was made in the construction of stoves.

[3] The principal sources from which these statements are drawn are Bishop's History of Manufactures, and the Universal Encyclopedia.

another was the first main cause of the progressive reduction in the rate at which wood was consumed per capita. The second was the growing availability of coal, particularly anthracite.

THE DISPLACEMENT OF WOOD BY COAL

Soft coal, discovered near Richmond, Va., about 1750, made its way slowly into industrial uses, especially in the coastal cities. In 1771 Franklin invented a stove for bituminous coal, which consumed its own smoke. Among the wealthy in cities about this time, "cannel" and other English coal (sea coal) was burned in imported grates or in the Rumford stove lined with firebrick. Before 1800 about 8,000 tons a year were imported from England. Hard coal was not used successfully until 1812, and successful anthracite stoves

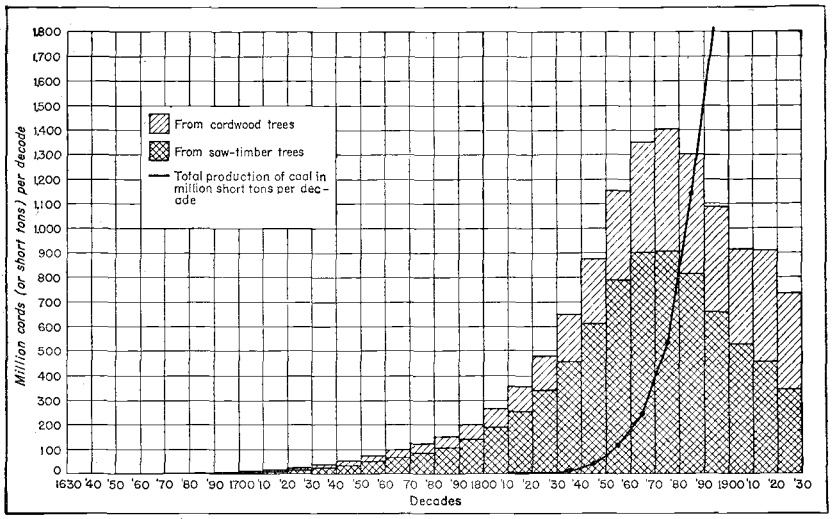

FIGURE 1.—Total fuel wood consumed in the United States, by decades, 1630–1930; and total production of coal, 1810–92. Peak production of coal was reached in 1920–29 with a total for the decade of 5,893 million tons.

were not devised until about 1820. About 1820, as wood fuel became scarce around northeastern cities, the industrial and household demand stimulated domestic coal production, and thereafter the mining business grew rapidly as machinery and railroads came into the picture. Between 1880 and 1890 the number of tons of coal mined nearly equalled the number of cords of fuel wood consumed (fig. 1). The increased availability of coal, especially when burned in grates and improved stoves, still further cut down the quantity of wood used.

In the Tenth Census Charles Sprague Sargent provided a map showing the relative use of different fuels in 1879, by regions and localities. He reports the use of coal as predominant in the more densely settled parts of Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, New Jersey, Ohio, Kentucky, Illinois, Iowa, Nebraska, and Kansas, as well as in leading cities remote from

these areas, such as Baltimore, Washington, a dozen or more in the Central and Lake States, 20 or more in the South, and Denver, Leadville, Salt Lake, San Francisco, Seattle, and Portland in the West. Surrounding or associated with the areas first mentioned are twilight zones in which coal was used but wood fuel was still predominant. Such areas also covered parts of Colorado and Wyoming. Outside of these areas and cities the fuel was practically all wood. Wood was used almost exclusively in the mountain portions of Maine, New Hampshire, and Vermont, central Indiana, the northerly parts of the Lake States, the entire South except Kentucky, and all settled rural portions of the Western States. Although per capita consumption had begun to decrease 30 years previously, this decade (1870–79) marks the peak of national fuel wood consumption. At that time nearly 3 cords of wood were used for each ton of coal mined (fig. 1).

KINDS OF WOOD PREFERRED AND SELECTION PRACTICED

Laboratory experts tell us that the fuel value of wood varies directly with the specific gravity. In other words, the heavier the wood the more heat units it contains. In the Northeast, hickory, white oak, sugar maple, beech, red oak, ash, and birch are favored hardwoods which have weights and fuel values about in the order named. Such softwoods as the northern larch, hemlock, spruce, pine, etc., are chiefly usable for kindling, since their fuel value is much less than that of hardwoods. Fuel value also varies with the dryness of the wood, as considerable heat is required to evaporate the moisture from green wood. Roughly speaking a cord of good dry hardwood, such as oak, hickory, hard maple, or beech, weighs about 2 tons and has about as much fuel value as a ton of coal.

Some woods having a high water content, such as black oak and elm, dry very imperfectly and hiss or steam when placed on a fire, burn poorly, and yield little heat.[4] Undesirable qualities in other species, such as the snapping of chestnut and hemlock, also make these unpopular for general fireplace use. Some of the softwoods contain large quantities of pitch, which cause them to ignite readily and to burn with a fierce flame, but also to emit large quantities of smoke which forms heavy soot in stovepipes, around ovens, and on utensils. For that reason the pine knots often used in the South, and the pinyon of the Southern Rocky Mountains, although excellent for the fireplace and widely used in heating stoves, are quite unfit for kitchen wood. Regular use of pitchy wood often results in chimney fires and clogged stovepipes. Many stovepipes are also corroded and destroyed by the condensation on them of acetic acid distilled from the wood. Chimneys and pipes can be cleaned, but most housewives will not tolerate bad stove drafts, slow-acting ovens, and soot in the dishwater.

The pioneers learned all of these things in the laboratory of practical experience. In all regions, at all times, they used for fuel whatever material was best for their purpose, the choice being determined by availability, heating value, ease of production, and lack

[4] KNEELAND, PAUL D. WOOD FUEL. MASS. STATE FOREST SERV., 11 pp. BOSTON. [1917.]

of objectionable qualities. On the Alaskan tundra it might be twigs of stunted willows or oil from animal fat. On the western plains it might be manzanita, or sagebrush, or cottonwood, or more commonly buffalo chips. In the forested regions nothing but wood was used until the distribution of coal was well established. How these preferences worked out over 300 years, expressed by regions, by kinds of wood favored, in the probable order of volume used, and with the heat values relative to that of a short ton of coal is indicated. in table 1.

TABLE 1.—*Leading fuel woods, in order of volume used,*[1] *with comparative heat value,*[2] *by regions, 1630–1930*

Kind, by region	Heat value	Kind, by region	Heat value	Kind, by region	Heat value
New England:	*Percent*	Lake—Continued.	*Percent*	Prairie—Continued.	*Percent*
Oaks	86	Pines		Ponderosa pine	58
Maple	84	Central:	70	Walnut	80
Birch	80	Oaks	86	North Rocky Mts.:	
Pines	70	Maple	84	Ponderosa	58
Beech	80	Pine (yellow)	77	Douglas fir	60
Hickory	96	Birch	80	Lodgepole pine	58
Middle Atlantic:		Hickory	96	Aspen or cotton-wood	56
Oaks	86	Beech	80	Larch	74
Maple	84	East Gulf:		South Rocky Mts.:	
Birch	80	Pine (yellow)	80	Juniper	73
Pines	70	Oaks	86	Pinyon	71
Beech	80	Hickory	96	Aspen	54
Hickory	96	Gum	68	Ponderosa pine	58
South Atlantic:		Ash	79	Oaks	94
Pine (yellow)	77	Chestnut	60	North Pacific:	
Oaks	86	Lower Mississippi:		Douglas-fir	68
Hickory	96	Pine (yellow)	85	Ponderosa pine	58
Gum	68	Oaks	86	Larch	74
Maple	84	Gum	68	Oaks	97
Ash	79	Hickory	96	Alder	57
Lake:		Ash	79	South Pacific:	
Oaks	86	Maple	84	Oaks	97
Maple	84	Prairie:		Ponderosa pine	58
Tamarack	75	Oaks	86	Douglas-fir	68
Aspen	54	Cottonwood	56	Redwood	55
Birch	80	Hickory	96	Eucalyptus	93
		Maple	84		

[1] Based largely on availability, fuel value, ease of splitting and lack of objectionable qualities, checked as possible against field advices and reports. *In each region the first 3 kinds named would probably include* 80 percent or more of the volume of fuel wood used throughout the regional history. Under present conditions the order of most regional lists would need revision.

[2] Percent of heat units in 1 short ton of coal contained in 1 cord (90 cubic feet) of air-dry wood as averaged from table 8, U. S. Dept. Agr. Bull. 753, The Use of Wood for Fuel. The kind of coal is not stated in any bulletin searched except one by A. F. Hawes, U. S. Fuel Administration, which specifies 2,000 pounds of anthracite.

Facing the hard conditions of pioneer life, and with plenty of timber in sight, there was formerly no incentive to practice forestry. The practical man filled his woodshed mainly with fuel from saw-timber trees of those species, such as oak, maple, and hickory, which gave him the greatest amount of heat with the least labor, considering also the need for a lasting fire and the minimum of smoke. Relatively young trees, 12 to 20 inches in diameter, were the easiest for a lone chopper to fell and split. Knotty trees and twisted grain were avoided. Charcoal burners chose the same kind of timber. Even in recent years, when hardwood saw timber became too valuable to burn, the fuel cutter's attack shifted to the cordwood trees of the same species. As a matter of fact many cutters still continue to use fine timber for fuel because it is the easiest to work. The drain on the forest was not only great in volume but directed against the

choicest elements of the stand. No other single cause has done more to deteriorate the once magnificent hardwood forests of the East than the incessant and intensive onslaught of the fuel cutters, maintained for three centuries.

QUANTITIES OF WOOD USED FOR FUEL

A conservative estimate of the aggregate fuel wood used in the United States in 300 years reaches the staggering total of nearly 12.5 billion cords (table 2). The quantity is equivalent in round figures to 1,000 billion cubic feet of standing timber, or 7 cubic miles of solid wood, not including the bark. That is nearly half of the cubic volume cut for all timber commodities in the past, including fuel, and more than twice the cubic volume required for the aggregate of all lumber sawed. It was not until after 1900 that the lumber cut exceeded the fuel cut in gross volume. At a nominal rate of $3 per cord, the value of the fuel wood burned equals the mill value of all lumber cut. These estimates do not include wood used for charcoal or the 500 or 550 million cords cut primarily for lumber that is estimated to have been burned as sawmill waste.

More than 90 percent of this wood was used for domestic purposes, which included both heating and kitchen use, as well as domestic manufactures, such as the smoking of meat, the drying of tobacco, and the preparation of maple products. About 75 percent of the total was burned in fireplaces.

About 75 percent was hardwood, and 40 to 50 percent of the total was oak. Hardwoods such as oak and aspen were favored fuel woods even in the West, where they comprised possibly 25 percent of the western total. But very little of the western hardwood used could be classified as saw timber. Western hardwoods are therefore included in the total fuel wood consumed (table 2), but not in the hardwood-lumber equivalent shown later in table 4.

Over 60 percent of all the wood taken was from saw-timber trees. At the peak of consumption (between 1870 and 1880) the saw-timber component was 64 percent, decreasing to 46 percent in 1920–29. The decrease of the proportion of saw timber as shown in figure 1 seems to indicate that about 40 percent of the fuel wood used in 1950 will still be cut from saw-timber trees.

The aggregate quantities of fuel wood consumed in each lumber region, for all decades, appear in the footings of table 2. The Central region leads, having used 25 percent of the total, followed by Middle Atlantic with 20 percent, and South Atlantic with 15 percent. Owing to the early settlement and the large populations of many eastern States 97 percent of the fuel wood was cut from eastern forests (fig. 2). The fact that only 3 percent of the total is allocated to western regions is due to their relatively small populations and to the growth of those populations within periods when the use of wood stoves and coal had become fairly general.

Whereas per capita consumption reached its peak in the United States about 1840 with an average of 4.5 cords, per capita consumption in regions such as Middle Atlantic and New England, with their early development of coal mines and railroads, began to decline before 1840, 60 years before the Pacific Coast States reached their

TABLE 2.—*Estimated total consumption of fuel wood by regions and decades, 1630–1930* [1]

[Thousand cords, 4 by 4 by 8 feet]

Decade	Eastern regions									Western regions					Total all regions
	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	North Pacific	South Pacific	North Rocky Mountains	South Rocky Mountains	Total	
1630–39	40	165				25			230						230
1640–49	90	440				75			605						605
1650–59	195	905				140			1,240						1,240
1660–69	605	1,380				330			2,315						2,315
1670–79	1,150	1,725				655			3,530						3,530
1680–89	1,725	2,000				1,010		5	4,740						4,740
1690–99	2,450	2,880				1,480	5	10	6,825						6,825
Subtotal	6,255	9,495				3,715	5	15	19,485						19,485
1700–09	4,300	4,675				2,110	15	10	11,110						11,110
1710–19	7,550	7,815				2,895	30	10	18,300						18,300
1720–29	11,450	12,480				4,165	90	15	28,200						28,200
1730–39	16,050	17,940				6,020	215	20	40,245						40,245
1740–49	21,250	24,440		40		10,060	370	30	56,190		5			5	56,195
1750–59	27,400	32,040		200		17,040	595	80	77,355		10			10	77,365
1760–69	33,800	39,500		600		24,750	930	220	99,800		10		10	20	99,820
1770–79	39,550	47,375		1,420	10	34,375	1,385	460	124,575		10		20	30	124,605
1780–89	45,365	57,205	15	2,890	20	46,140	2,360	815	154,900		20		20	40	154,940
1790–99	53,565	73,970	40	7,240	20	59,940	4,775	1,380	200,930		40		25	65	200,995
Subtotal	260,280	317,530	55	12,390	50	207,495	10,765	3,040	811,605		95		75	170	811,775

[1] Based on population at each decennial year multiplied by probable per capita consumption varying in each region throughout its period of occupation. The per capita rates applied conform to Forest Service record data for 1933, 1925–29, 1918, and 1907, and to the record of the Census of Manufactures (Dr. Charles S. Sargent) for 1879. The highest per capita rate applied was 4.9 cords used in New England, 1800–20, and in Lake, 1860. The lowest rate was 0.19 cord used in Middle Atlantic and South Rocky Mountain, 1930. The rates used are intended to include both domestic and industrial consumption and take into consideration the climate, the timber, the characteristics of the population, housing conditions, the shift from fireplaces to stoves, and the displacement of wood by mineral fuels. The quantity here tabulated for each decade is the average of the computed consumption at the beginning and the end of the decade multiplied by 10. Industrial consumption as used in this connection includes the wood cut for fuel and used by railroads, steamboats, mines and smelters, brickyards, and the processors of wool and salt. Also such domestic manufactures as the preparation of lye and soap, the boiling of syrup and the curing of meat, fish, and tobacco. About 100,000,000 cords probably burned for charcoal are omitted for lack of data to afford distribution in time or by regions. The wood fuel burned by sawmills for the production of power—possibly 550,000,000 cords between 1830 and 1930, is purposely excluded, as it is taken almost entirely from the waste of the lumber industry. Annual consumption for 3 specified years for all States and regions is given in table 6, Appendix.

NOTE.—*This is a table of consumption*—not drain—as it unavoidably includes unknown percentages of wood which were either the waste of other industries, or accounted for by estimates of damage, or cut from noncommercial forest lands. The succeeding tables exclude these elements as well as the cordwood component, and are strictly saw-timber drain.

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TABLE 2.—*Estimated total consumption of fuel wood by regions and decades, 1630–1930* [1]—Continued

[Thousand cords, 4 by 4 by 8 feet]

Decade	Eastern regions									Western regions					Total all regions
	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	North Pacific	South Pacific	North Rocky Mountains	South Rocky Mountains	Total	
1800–09	64, 360	100, 630	85	18, 205	30	74, 135	8, 630	2, 155	268, 230	----------	70	----------	40	110	268, 340
1810–19	74, 580	133, 175	175	38, 820	50	87, 515	15, 650	7, 005	356, 970	15	125	10	65	215	357, 185
1820–29	84, 455	170, 410	580	79, 390	155	102, 480	29, 605	12, 485	479, 560	40	210	30	105	385	479, 945
1830–39	94, 045	207, 905	5, 225	158, 825	775	110, 615	49, 405	24, 635	651, 430	105	505	65	160	835	652, 265
1840–49	105, 060	251, 610	21, 370	257, 730	3, 830	117, 670	69, 665	48, 680	875, 615	250	1, 650	145	875	2, 920	878, 535
1850–59	106, 390	310, 680	57, 180	359, 465	17, 110	130, 535	88, 110	82, 490	1, 142, 960	1, 050	7, 510	330	2, 910	11, 800	1, 154, 760
1860–69	91, 640	307, 890	103, 785	441, 470	41, 420	137, 655	99, 745	106, 960	1, 330, 565	2, 575	16, 005	770	5, 405	24, 755	1, 355, 320
1870–79	63, 325	256, 280	136, 250	450, 255	63, 600	153, 520	114, 410	132, 690	1, 370, 330	6, 595	19, 745	1, 960	8, 355	36, 655	1, 406, 985
1880–89	42, 935	173, 525	148, 110	363, 925	67, 640	164, 515	125, 595	165, 310	1, 251, 555	15, 820	19, 240	6, 550	10, 590	52, 200	1, 303, 755
1890–99	42, 775	104, 570	136, 460	254, 825	53, 140	147, 955	116, 450	168, 370	1, 024, 545	24, 660	16, 780	11, 115	10, 340	62, 895	1, 087, 440
Subtotal	769, 565	2, 007, 675	609, 220	2, 422, 910	247, 750	1, 226, 595	717, 265	750, 780	8, 751, 760	51, 110	81, 840	20, 975	38, 845	192, 770	8, 944, 530
1900–09	43, 015	70, 245	107, 705	212, 470	37, 065	124, 630	102, 830	157, 645	855, 605	25, 375	16, 005	8, 405	10, 755	60, 540	916, 145
1910–19	39, 010	59, 620	131, 815	220, 205	28, 870	122, 100	104, 345	149, 785	855, 750	22, 265	17, 190	5, 585	12, 145	57, 185	912, 935
1920–29	33, 010	58, 470	68, 935	177, 305	20, 400	112, 360	88, 740	137, 000	696, 220	19, 620	16, 200	5, 670	8, 690	50, 180	746, 400
Subtotal	115, 035	188, 335	308, 455	609, 980	86, 335	359, 090	295, 915	444, 430	2, 407, 575	67, 260	49, 395	19, 660	31, 590	167, 905	2, 575, 480
Aggregate	1, 151, 135	2, 523, 035	917, 730	3, 045, 280	334, 135	1, 796, 895	1, 023, 950	1, 198, 265	11, 990, 425	118, 370	131, 330	40, 635	70, 510	360, 845	12, 351, 270

peak of consumption. But on account of the effect of the growth of national population, the peak of volume consumed in the United States did not occur until a period just before 1880 (fig. 1). Since the peak period, the volume consumed has decreased more than 50 percent, and the per capita rate to about 0.5 cord. The abnormal height of the vertical bar representing consumption in the decade 1910–19 reflects the influence of measures taken during the first World War to conserve coal by stimulating the use of wood fuel.

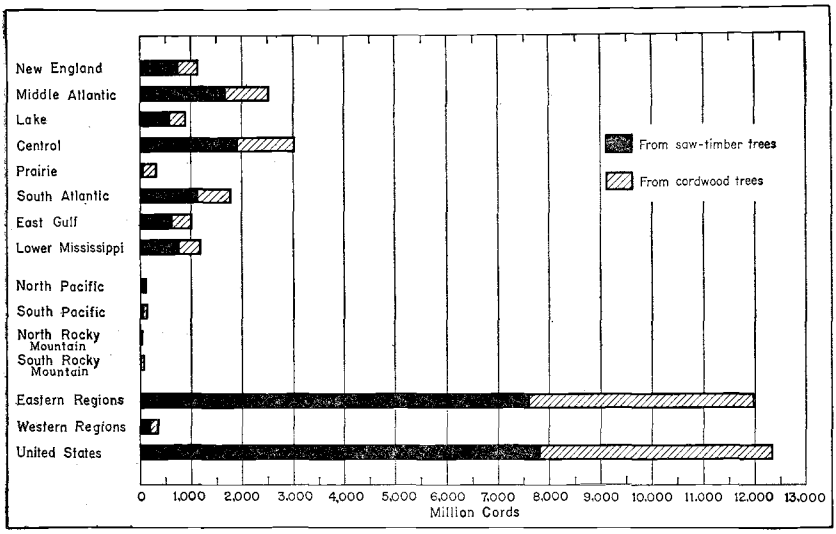

FIGURE 2.—Total fuel wood consumed, by regions, 1630–1930.

POTENTIAL LUMBER USED AS FUEL CONTRASTED WITH LUMBER CUT

A total of 2,700 billion board feet of potential lumber has been burned as fuel (table 3). The quantity is greater than either the present saw-timber stand (1,764 billion feet) or the aggregate lumber cut (2,200 billion feet) since 1800. The regional distribution of the lumber so consumed is shown by the footings of table 3 and also in figure 3. The Central region leads, with 24 percent of the total.

During the total period of 300 years the average cord burned included 219 board feet of potential lumber (fig. 4). Owing to the decreasing utilization of saw timber for fuel in most regions since 1900, the average cord used in 1930 included only about 85 board feet of potential lumber, the regional averages varying from less than 20 feet in the Middle Atlantic, Prairie, New England, and South Rocky Mountain regions to about 270 feet in the North Pacific. Some further slight reduction may be expected.

Hardwoods were the principal species used for fuel wherever they could be had, on account of their high fuel value and clean burning properties. A solid chunk of oak would burn all night. Although a great deal of oak, aspen, etc. is used in western regions, it is practically all from trees not classified as saw timber and hence does

TABLE 3.—*Estimated lumber equivalent of all saw-timber trees used for fuel, by regions and decades, 1630–1930* [1]

[Million feet board measure]

Decade	Eastern regions (hardwoods and softwoods)									Western regions (softwoods only)					Total, all regions
	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	North Pacific	South Pacific	North Rocky Mountain	South Rocky Mountain	Total	
1630–39	10	35	----	----	----	5	----	----	50	----	----	----	----	----	50
1640–49	20	95	----	----	----	15	----	----	130	----	----	----	----	----	130
1650–59	45	155	----	----	----	25	----	----	225	----	----	----	----	----	225
1660–69	135	260	----	----	----	55	----	----	450	----	----	----	----	----	450
1670–79	250	375	----	----	----	115	----	----	740	----	----	----	----	----	740
1680–89	375	435	----	----	----	185	----	----	995	----	----	----	----	----	995
1690–99	545	625	----	----	----	270	----	----	1,440	----	----	----	----	----	1,440
Subtotal	1,380	1,980	----	----	----	670	----	----	4,030	----	----	----	----	----	4,030
1700–09	990	1,025	----	----	----	390	----	----	2,405	----	----	----	----	----	2,405
1710–19	1,770	1,740	----	----	----	550	5	----	4,065	----	----	----	----	----	4,065
1720–29	2,745	2,825	----	----	----	820	20	5	6,415	----	----	----	----	----	6,415
1730–39	3,960	4,125	----	----	----	1,215	45	10	9,355	----	----	----	----	----	9,355
1740–49	5,395	5,755	----	5	----	2,070	75	15	13,315	----	----	----	----	----	13,315
1750–59	7,100	7,770	----	35	----	3,525	125	35	18,590	----	----	----	----	----	18,590
1760–69	8,875	9,780	----	115	----	5,165	200	85	24,220	----	----	----	----	----	24,220
1770–79	10,520	11,990	----	290	----	7,295	305	175	30,575	----	----	----	----	----	30,575
1780–89	12,145	14,905	5	625	----	9,945	530	315	38,470	----	----	----	----	----	38,470
1790–99	14,345	19,635	10	1,630	----	13,120	1,080	530	50,350	----	----	----	----	----	50,350
Subtotal	67,845	79,550	15	2,700	----	44,095	2,385	1,170	197,760	----	----	----	----	----	197,760
1800–09	17,235	26,865	20	4,220	----	16,335	1,975	825	67,475	----	----	----	----	----	67,475
1810–19	19,970	35,555	45	9,255	----	19,285	3,605	1,605	89,320	5	5	----	----	10	89,330
1820–29	22,455	45,500	145	19,300	10	22,585	6,890	2,905	119,790	10	15	5	5	35	119,825
1830–39	24,670	55,110	1,350	38,800	55	24,375	11,560	5,900	161,820	35	50	20	15	120	161,940
1840–49	27,180	65,790	5,660	62,965	285	25,930	16,305	11,900	216,015	100	220	45	100	465	216,480
1850–59	26,990	77,245	15,230	87,820	1,345	28,765	20,620	20,275	278,290	440	1,365	105	345	2,255	280,545
1860–69	22,315	76,270	27,635	106,215	3,285	30,330	23,340	26,500	315,890	1,110	3,385	265	660	5,420	321,310
1870–79	14,445	59,950	36,030	105,345	5,045	33,825	26,545	33,115	314,300	2,930	4,560	695	1,035	9,220	323,520
1880–89	8,455	37,025	38,910	81,760	5,260	35,975	28,935	41,260	277,580	7,075	4,530	2,365	1,290	15,260	292,840
1890–99	6,590	18,765	35,395	52,425	3,960	31,490	26,090	41,300	216,015	11,035	3,880	4,030	1,180	20,125	233,140
Subtotal	190,305	498,075	160,420	568,105	19,245	268,895	165,865	185,585	2,056,495	22,740	18,010	7,530	4,630	52,910	2,109,405

1900–09	4,900	9,575	24,015	36,550	2,575	24,120	20,935	35,635	158,305	10,905	3,540	3,010	1,050	18,505	176,810
1910–19	2,840	4,810	12,660	29,065	1,705	19,190	17,800	27,745	115,815	8,595	3,445	1,600	895	14,535	130,350
1920–29	1,065	2,075	5,040	16,430	795	14,805	12,935	19,395	72,540	6,240	2,475	970	405	10,090	82,620
Subtotal	8,805	16,460	1,715	82,045	5,075	58,115	51,670	82,775	346,660	25,740	9,460	5,580	2,350	43,130	389,790
Aggregate	268,335	596,065	202,150	652,850	24,320	371,775	219,920	269,530	2,604,945	48,480	27,470	13,110	6,980	96,040	2,700,985
	Bd. ft.	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*	*Bd. ft.*
Board feet per cord.															
In all wood used	233	236	220	214	73	207	215	225	217	410	209	323	115	266	219
In wood from saw-timber trees	355	354	341	338	344	323	336	349	342	433	457	440	405	438	345
Ratio of lumber in fuel to aggregate lumber sawed, 1800–1935, as percentage of regional total	*Percent* 181	*Percent* 252	*Percent* 50	*Percent* 242	*Percent* 243	*Percent* 224	*Percent* 122	*Percent* 73	*Percent* 146	*Percent* 17	*Percent* 40	*Percent* 34	*Percent* 47	*Percent* 23	*Percent* 123

[1] Decennial year computations cumulated into quantities tabulated for decades. Based on numbers of cords cut from saw-timber trees, multiplied by factors intended to indicate the number of board feet of potential lumber per cord, by regions, as follows: New England, 357–229; Middle Atlantic, 356–220; Lake, 355–212; Central, 349–215; Prairie, 345–204; South Atlantic, 339–200; East Gulf, 360–208; Lower Mississippi, 384–205; North Pacific, 471–288; South Pacific, 471–290; North Rocky Mountain, 453–280; South Rocky Mountain, 413–266. Equivalent quantities of softwood saw-timber trees used for fuel are given in table 7, appendix.

TABLE 4.—*Estimated lumber equivalent of hardwood saw-timber trees used for fuel in the eastern regions, by decades, 1630–1930* [1]

[Million feet board measure]

Decade	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	Percent of total lumber equivalent
1630–39	10	35							45	90
1640–49	20	90				5			115	88
1650–59	40	140				10			190	84
1660–69	120	235				20			375	83
1670–79	225	340				50			615	83
1680–89	335	390				85			810	81
1690–99	490	560				120			1,170	81
Subtotal	1,240	1,790				290			3,320	82
1700–09	895	920				170			1,985	83
1710–19	1,595	1,565				245			3,405	84
1720–29	2,470	2,545				370	5		5,390	84
1730–39	3,565	3,715				545	15		7,840	84
1740–49	4,855	5,180		5		930	30	5	11,005	83
1750–59	6,390	6,995		30		1,585	50	15	15,065	81
1760–69	7,990	8,805		100		2,325	80	35	19,335	80
1770–79	9,470	10,790		260		3,285	125	70	24,000	78
1780–89	10,930	13,415	5	565		4,475	215	125	29,730	77
1790–99	12,910	17,675	10	1,470		5,905	435	210	38,615	77
Subtotal	61,070	71,605	15	2,430		19,835	955	460	156,370	79
1800–09	15,515	24,180	20	3,800		7,350	790	330	51,985	77
1810–19	17,975	32,000	40	8,330		8,675	1,440	645	69,105	77
1820–29	20,210	40,950	130	17,370	10	10,160	2,755	1,165	92,750	77
1830–39	22,205	49,600	1,215	34,920	55	10,965	4,625	2,360	125,945	78
1840–49	24,465	59,210	5,095	56,670	275	11,665	6,525	4,760	168,665	78
1850–59	24,295	69,520	13,710	79,040	1,280	12,940	8,250	8,110	217,145	77
1860–69	20,085	68,645	24,870	95,595	3,120	13,645	9,335	10,600	245,895	77
1870–79	13,000	53,955	32,425	94,810	4,790	15,220	10,615	13,250	238,065	74
1880–89	7,610	33,320	35,020	73,580	4,995	16,190	11,570	16,505	198,790	68
1890–99	5,930	16,885	31,855	47,180	3,760	14,170	10,435	16,520	146,735	62
Subtotal	171,290	448,265	144,380	511,295	18,285	120,980	66,340	74,245	1,555,080	74
1900–09	4,410	8,615	21,610	32,895	2,445	10,850	8,375	14,255	103,455	59
1910–19	2,560	4,330	11,390	25,515	1,620	8,635	7,120	11,100	72,270	55
1920–29	960	1,870	4,485	13,615	755	6,095	4,955	7,595	40,330	49
Subtotal	7,930	14,815	37,485	72,025	4,820	25,580	20,450	32,950	216,055	55
Aggregate	241,530	536,475	181,880	585,750	23,105	166,685	87,745	107,655	1,930,825	71

[1] For softwood figures, see table 7, Appendix. The hardwood-lumber equivalent figures above were obtained for each region by multiplying the total lumber equivalent figures by a factor deemed reasonable to show the percentage of hardwood in the cords of saw timber used for fuel, as follows: New England, 90; Middle Atlantic, 90; Lake, 90–83; Central, 90–75; Prairie, 95; South Atlantic, 45–35; East Gulf, 40–35; Lower Mississippi, 40–38; Eastern regions, 74–45.

not enter into the lumber equivalent estimates. In California, particularly, about 60 percent of the fuel wood consumed is oak of high fuel value from the chaparral stands.

The national percent of hardwood decreases steadily, because of the increasing influence of softwood regions such as East Gulf, Lower Mississippi, and the four in the West (table 4). In these regions significant consumption began later than in the Northeast, and they used smaller percentages of hardwood. The western regions, in fact, used practically no hardwood having a lumber equivalent.

In 1800 the lumber equivalent of the fuel wood burned in the United States was about 18 times as great as the lumber cut. In 1879, near the peak of fuel-wood consumption, the potential lumber burned was twice as great as the lumber sawed. It was not until after 1890 that the lumber sawed considerably exceeded the lumber

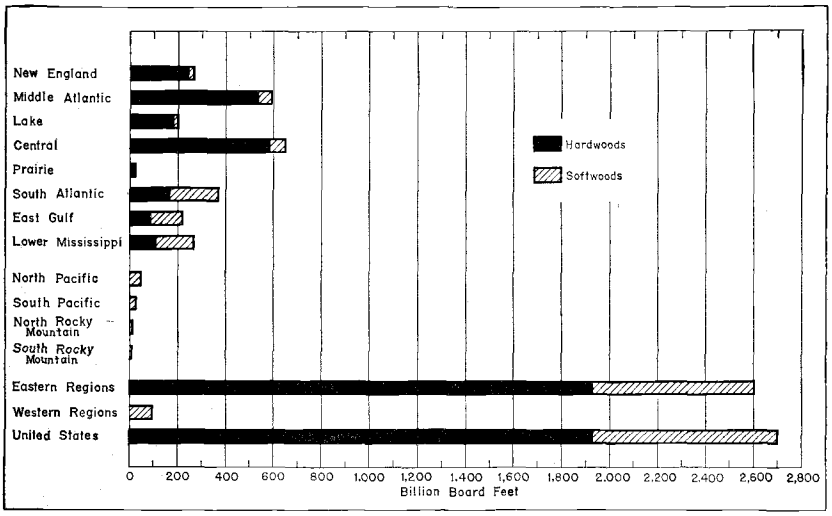

FIGURE 3.—Lumber equivalent of fuel wood consumed, by regions, 1630–1930.

equivalent in the fuel burned. The total of potential lumber in fuel for the decade 1920–29 amounted to only one-fourth of the lumber cut and about one-seventh of the total saw-timber drain. By 1929 the annual lumber cut was about seven times as great as the lumber content of the wood fuel consumed. It will be observed in table 5 that the six old-settled regions have burned more lumber as fuel than the entire product of their sawmills. That statement applies also to the United States as a whole and would be true of the same six regions and the United States even if the lumber sawed were contrasted

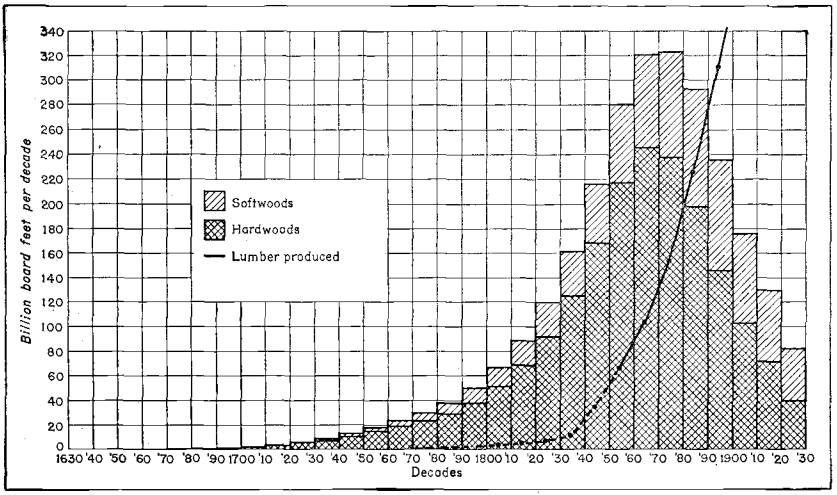

FIGURE 4.—Lumber equivalent of fuel wood consumed by decades, 1630–1930, and lumber produced 1770–1900. Peak lumber production was reached in the 1900–09 decade at 400 billion board feet.

with the potential lumber burned since 1800. It should, however, be recollected in this connection that, while the lumber sawed was largely softwood, the lumber burned was largely hardwood and for that reason was in general more valuable as fuel than as lumber.

TABLE 5.—*Estimated regional consumption of fuel wood, and its lumber equivalent, 1630–1930*

Region	Total consumption		Portion of regional total taken from saw-timber trees		Lumber equivalent of saw-timber trees		Average lumber per cord [1]	Relation to aggregate lumber cut [2]
					Total	Hardwood		
	Thousand cords	*Percent*	*Thousand cords*	*Percent*	*Million board feet*	*Million board feet*	*Board feet*	*Percent*
New England	1,151,135	9.3	756,580	65.7	268,335	241,530	233	181.3
Middle Atlantic	2,523,035	20.4	1,683,680	66.7	596,065	536,475	236	251.5
Lake	917,730	7.4	592,465	64.6	202,150	181,880	220	49.7
Central	3,045,280	24.7	1,930,495	63.4	652,850	585,750	214	241.8
Prairie	334,135	2.7	70,730	21.2	24,320	23,105	73	[3]243.2
South Atlantic	1,796,895	14.6	1,149,910	64.0	371,775	166,685	207	224.0
East Gulf	1,023,950	8.3	655,295	64.0	219,920	87,745	215	121.5
Lower Mississippi	1,198,265	9.7	773,015	64.5	269,530	107,655	225	73.2
Total South	4,019,110	32.6	2,578,220	64.2	861,225	362,085	214	120.5
Total eastern regions	11,990,425	97.1	7,612,170	63.5	2,604,945	1,930,825	217	145.8
North Pacific	118,370	1.0	111,955	94.6	48,480	----------	410	16.7
South Pacific	131,330	1.0	60,150	45.8	27,470	----------	209	39.8
North Rocky Mountain	40,635	.3	29,800	73.3	13,110	----------	323	33.6
South Rocky Mountain	70,510	.6	17,250	24.5	6,980	----------	115	46.5
Total western regions	360,845	2.9	219,155	60.7	96,040	----------	266	23.3
Total United States	12,351,270	100.0	7,831,325	63.4	2,700,985	1,930,825	219	122.8

[1] Averages based on all wood consumed. The lumber content of cords from saw-timber trees is naturally larger as cordwood and waste wood are eliminated. All-time averages on this basis show 342 board feet for eastern regions, 438 board feet for western regions, and 345 feet for the United States.

[2] The percents tabulated in this column contrast the aggregate lumber cut of each region, 1800–1935, with the total lumber burned as fuel, 1630–1930.

[3] The large percent shown for Prairie is justified by the fact that 17 billion feet of northern softwoods, sawed in the Prairie region, was cut out of white pine logs rafted from the Lake States. This quantity was deducted from the Prairie lumber cut and added to that of the Lake region in computing these percents.

As shown in table 4, about 70 percent of the estimated lumber in fuel was hardwood. This suggests an interesting contrast with the lumber-industry data, in which the aggregate cut from 1800 to 1935 had a hardwood component of only 23 percent. Thus, on the basis of national averages, the fuel cut supplemented the lumber cut in the utilization of mixed forests. Each required principally what the other did not want. That happy condition did not exist in all regions. In the West far more and better hardwood would have been burned had it been available. The Central and Middle Atlantic regions, however, found it expedient not only to destroy much of the original hardwood on their agricultural lands, but to ship in scores of billions of feet of softwoods in the form of lumber.

SUMMARY AND CONCLUSION

Although the use of fuel wood has decreased steadily for more than 50 years, the quantity cut is still nearly half as great as it was at the peak, and second only to lumber as an item of commodity drain. In 1940 there was no indication that any other commodity, even pulpwood, would dislodge fuel from second place in drain tabulations.

Judging solely from the trend observable in figure 1 it would be unwise to contemplate a consumption of less than 45 million cords per year before 1960.

Owing to the increased utilization of waste and undesirable timber, only about 40 percent of the wood consumed hereafter will be cut from saw timber. Even so, the potential lumber included in the fuel burned may reasonably be estimated at 4 billion board feet a year, of which nearly 2 billion will be hardwoods and 1 billion feet may be oak. The preference of fuel cutters for young saw timber, primarily oak, has already been mentioned. In the absence of fuel statistics the concentrated nature of this drain was not generally obvious. That may serve to explain in part why extensive areas of white oak saw timber and fine hickory and ash are no longer easily found where they once were plentiful.

A more economical use of the best timber as fuel in the distant past was not to be expected, nor need it be regretted. It was well expended, since much of it had a low or even a negative market value, and it served what was then its highest purpose. It remains, however, for modern foresters to correct the poor silvicultural conditions which have resulted.

Up to the present this country has been "muddling through," depending, consciously or otherwise, on the past bounties of Nature to continue indefinitely with little effort on the part of those who receive them. That negligent attitude is not justified by what is known of the habits of forests, which persist in deteriorating unless cutting is conducted under a certain scheme of common-sense rules, called forestry.

APPENDIX

TABLE 6.—*Fuel-wood consumption, by States and regions, 1879,*[1] *1908,*[2] *and 1918* [3]

[In thousand cords]

State and region	In 1879	In 1908			In 1918
		On farms	*Urban*	*Total*	
Alabama	6,077	4,125	270	4,395	5,158
Arizona	170	59	46	105	208
Arkansas	3,922	3,840	439	4,279	5,431
California	1,748	849	370	1,219	1,885
Colorado	427	138	50	188	400
Connecticut	526	272	197	469	540
Delaware	177	69	24	93	155
District of Columbia	27		25	25	
Florida	609	426	262	688	1,265
Georgia	5,910	4,213	524	4,737	6,600

[1] Sargent, Charles S. THE FORESTS OF THE UNITED STATES IN THEIR ECONOMIC ASPECTS. In Census of Manufactures, 1879, v. 9, p. 489. The figures above are for domestic consumption only. In addition the author shows industrial use as follows, in thousand cords: By railroads, 1,972; by steamboats, 788; in mineral operations, 625; in manufactures, 1,856. The grand total is 145,788 thousand cords, valued at $321,962,000. Charcoal consumption is recorded as 74,000,000 bushels, of which 70,000,000 bushels were used in the manufacture of iron.

[2] Pierson, Albert H. CONSUMPTION OF FIREWOOD IN THE UNITED STATES. U. S. Dept. Agr. Circ. 181, 7 pp. illus. 1910. The figures above are domestic consumption only. In addition the author shows fuel wood used in mineral and other miscellaneous operations reported from practically all States. The grand total is 85,937 thousand cords, valued at $249,841,000.

[3] Bureau of Crop Estimates, from county estimates supplied by county crop reporters. Of the total production shown, 77,092,000 cords were consumed on farms, the remainder being used in the adjacent villages and small towns. The total valuation is $487,106,000. These figures may probably be accepted as a reasonable estimate of total consumption. They are probably 25 percent in excess of normal for the period, however, owing to the fact that, as a war measure to conserve coal, the Forest Service and the State Foresters had conducted an active campaign of advice and instruction, urging farmers to increase the wood fuel cut.

TABLE 6.—*Fuel-wood consumption, by States and regions, 1879, etc.*—Continued

[In thousand cords]

State and region	In 1879	In 1908			In 1918
		On farms	Urban	Total	
Idaho	100	161	53	214	350
Illinois	5,200	2,066	301	2,367	1,793
Indiana	7,060	2,177	434	2,611	2,389
Iowa	4,091	1,257	143	1,400	1,612
Kansas	2,095	468	48	516	889
Kentucky	7,995	3,520	146	3,666	4,765
Louisiana	1,945	2,143	315	2,458	2,460
Maine	1,216	748	460	1,208	1,200
Maryland	1,153	506	89	595	705
Massachusetts	890	407	503	910	658
Michigan	7,839	2,539	1,124	3,663	4,415
Minnesota	1,669	1,949	478	2,427	1,909
Mississippi	5,091	3,710	325	4,035	5,900
Missouri	4,016	3,635	317	3,952	4,342
Montana	120	168	54	222	288
Nebraska	908	176	26	202	333
Nevada	155	17	30	47	60
New Hampshire	568	352	315	667	424
New Jersey	643	267	83	350	330
New Mexico	170	59	28	87	675
New York	11,291	2,091	494	2,585	3,225
North Carolina	7,435	4,043	713	4,756	6,600
North Dakota	423	109	66	175	250
Ohio	8,191	2,391	240	2,631	3,494
Oklahoma		1,529	154	1,683	2,444
Oregon	482	520	476	996	1,040
Pennsylvania	7,362	1,648	206	1,854	1,908
Rhode Island	155	50	46	96	183
South Carolina	3,671	2,632	373	3,005	4,141
South Dakota	(1)	106	44	150	238
Tennessee	8,085	4,421	274	4,695	4,699
Texas	4,884	2,518	1,531	4,049	6,231
Utah	172	97	21	118	360
Vermont	782	430	258	688	619
Virginia	5,416	3,385	227	3,612	4,420
Washington	184	603	704	1,307	1,283
West Virginia	2,241	906	21	927	1,529
Wisconsin	7,206	2,111	899	3,010	3,033
Wyoming	40	54	2	56	67
Total	140,537	69,960	14,228	84,188	102,903
Regional summary:					
New England	4,137	2,259	1,779	4,038	3,624
Middle Atlantic	20,653	4,581	921	5,502	6,323
Lake	16,714	6,599	2,501	9,100	9,357
Central	42,788	19,116	1,733	20,849	23,011
Prairie	7,517	2,116	327	2,443	3,322
South Atlantic	16,522	10,060	1,313	11,373	15,161
East Gulf	12,596	8,764	1,056	9,820	13,023
Lower Mississippi	15,842	13,740	2,764	16,504	22,466
North Pacific	666	1,123	1,180	2,303	2,323
South Pacific	1,903	866	400	1,266	1,945
North Rocky Mountain	220	329	107	436	638
South Rocky Mountain	979	407	147	554	1,710

[1] Included with North Dakota.

TABLE 7.—*Estimated lumber equivalent of softwood saw-timber trees used for fuel, by regions and decades, 1630–1930* [1]

[Million feet board measure]

Decade	Eastern regions									Western regions					Total all regions
	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	North Pacific	South Pacific	North Rocky Mountain	South Rocky Mountain [2]	Total	
1630–39						5			5						5
1640–49		5				10			15						15
1650–59	5	15				15			35						35
1660–69	15	25				35			75						75
1670–79	25	35				65			125						125
1680–89	40	45				100			185						185
1690–99	55	65				150			270						270
Subtotal	140	190				380			710						710
1700–09	95	105				220			420						420
1710–19	175	175				305	5		660						660
1720–29	275	280				450	15	5	1,025						1,025
1730–39	395	410				670	30	10	1,515						1,515
1740–49	540	575				1,140	45	10	2,310						2,310
1750–59	710	775		5		1,940	75	20	3,525						3,525
1760–69	885	975		15		2,840	120	50	4,885						4,885
1770–79	1,050	1,200		30		4,010	180	105	6,575						6,575
1780–89	1,215	1,490		60		5,470	315	190	8,740						8,740
1790–99	1,435	1,960		160		7,215	645	320	11,735						11,735
Subtotal	6,775	7,945		270		24,260	1,430	710	41,390						41,390
1800–09	1,720	2,685		420		8,985	1,185	495	15,490						15,490
1810–19	1,995	3,555	5	925		10,610	2,165	960	20,215	5	5			10	20,225
1820–29	2,245	4,550	15	1,930		12,425	4,135	1,740	27,040	10	15	5	5	35	27,075
1830–39	2,465	5,510	135	3,880		13,410	6,935	3,540	35,875	35	50	20	15	120	35,995
1840–49	2,715	6,580	565	6,295	10	14,265	9,780	7,140	47,350	100	220	45	100	465	47,815
1850–59	2,695	7,725	1,520	8,780	65	15,825	12,370	12,165	61,145	440	1,365	105	345	2,255	63,400
1860–69	2,230	7,625	2,765	10,620	165	16,685	14,005	15,900	69,995	1,110	3,385	265	660	5,420	75,415
1870–79	1,445	5,995	3,605	10,535	255	18,605	15,930	19,865	76,235	2,930	4,560	695	1,035	9,220	85,455

[1] Softwood lumber quantities are the differences between the total lumber equivalent figures and the hardwood lumber figures, as calculated for each region and cumulated by decades.

[2] In this region particularly, a very large part of the fuel wood used is "cedar" (*Juniperus scopulorum*, et. al.). The juniper and pinyon stands are practically all cordwood trees, and hence do not enter into this table.

TABLE 7.—*Estimated lumber equivalent of softwood saw-timber trees used for fuel, by regions and decades, 1630–1930*—Continued

[Million feet board measure]

Decade	Eastern regions									Western regions					Total all regions
	New England	Middle Atlantic	Lake	Central	Prairie	South Atlantic	East Gulf	Lower Mississippi	Total	North Pacific	South Pacific	North Rocky Mountain	South Rocky Mountain	Total	
1880–89	845	3,705	3,890	8,180	265	19,785	17,365	24,755	78,790	7,075	4,530	2,365	1,290	15,260	94,050
1890–99	660	1,880	3,540	5,245	200	17,320	15,655	24,780	69,280	11,035	3,880	4,030	1,180	20,125	89,405
Subtotal	19,015	49,810	16,040	56,810	960	147,915	99,525	111,340	501,415	22,740	18,010	7,530	4,630	52,910	554,325
1900–09	490	960	2,405	3,655	130	13,270	12,560	21,380	54,850	10,905	3,540	3,010	1,050	18,505	73,365
1910–19	280	480	1,270	3,550	85	10,555	10,680	16,645	43,545	8,595	3,445	1,600	895	14,535	58,080
1920–29	105	205	555	2,815	40	8,710	7,980	11,800	32,210	6,240	2,475	970	405	10,090	42,300
Subtotal	875	1,645	4,230	10,020	255	32,535	31,220	49,825	130,605	25,740	9,460	5,580	2,350	43,130	173,735
Aggregate	26,805	59,590	20,270	67,100	1,215	205,090	132,175	161,875	674,120	48,480	27,470	13,110	6,980	96,040	770,160

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