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FOURTEENTH CENSUS OF THE UNITED STATES  
MANUFACTURES: 1919

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# FOREST PRODUCTS

INCLUDING THE LUMBER INDUSTRY, PULP-WOOD CONSUMPTION AND  
WOOD-PULP PRODUCTION, FOREST PRODUCTS CONSUMED IN  
THE MANUFACTURE OF DYESTUFFS AND EXTRACTS,  
AND IN TANNING AND WOOD DISTILLA-  
TION, AND TURPENTINE AND  
ROSIN

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## EXPLANATION OF TERMS.

**Scope of census.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of ownership, size of establishments, and similar subjects. When use is made of the statistics for these purposes it is imperative that due attention be given to their limitations, particularly in connection with any attempt to derive from them figures purporting to show average wages, cost of production, or profits.

The census did not cover establishments which were idle during the entire year or for which products were valued at less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions.

**Period covered.**—The returns relate to the calendar year 1919, or the business year which corresponded most nearly to that calendar year, and cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—As a rule, the term "establishment" represents a single plant or factory, but in some cases it represents two or more plants which were operated under a common ownership or for which one set of books of account was kept. If, however, the plants constituting an establishment as thus defined were not all located within the same city, county, or state, separate reports were secured in order that the figures for each plant might be included in the statistics for the city, county, or state in which it was located. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products different from those covered by the class designation, and, on the other hand, may not represent the total product covered by this designation, because some products of this class may be made in establishments in which it is not the product of chief value.

**Influence of increased prices.**—In comparing figures for cost of materials, value of products, and value added by manufacture in 1919 with the corresponding figures for earlier censuses, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures fail to afford an exact measure of the increase in the volume of business.

**Persons engaged in the industry.**—The following general classes of persons engaged in the manufacturing industries were distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks (including other subordinate salaried employees), and (5) wage earners.

The number of persons engaged in each industry, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for a single representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where this date did not portray such conditions, an earlier date was requested.

In the case of employees other than wage earners the number thus reported for the representative date has been treated as equivalent to the average for the year, since the number of employees of this class does not ordinarily vary much from month to month. In the case of wage earners the average has been obtained in the manner explained in the next paragraph.

In addition to the more detailed report by sex and age of the number of wage earners on the representative date, a report was obtained of the number employed on the 15th of each month, by sex, without distinction of age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported for the several months by 12. The importance of the industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given in certain tables for each separate industry, is not totaled for all industries combined, because, in view of the variations of date, such a total is not believed to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In order to determine as nearly as possible the age distribution of the average number of wage earners for an industry, the per cent distribution by age of the wage earners for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. The percentages thus obtained have been applied to the average number of wage earners for the year to determine the average numbers 16 years and over, and under 16, employed.

**Salaries and wages.**—Under these heads are given the total payments during the year for salaries and wages, respectively. The Census Bureau has not undertaken to calculate the average annual earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages, and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calcu-

late accurately even so simple an average as this, since the number of wage earners fluctuates from month to month in every industry, and in some cases to a very great extent. The Census Bureau's figures for wage earners, as already explained, are averages based on the number employed on the 15th of each month, and while representing the number according to the pay rolls to whom wages were paid on that date, no doubt represent a larger number than would be required to perform the work in any industry if all were continuously employed during the year.

**Prevailing hours of labor.**—No attempt was made to ascertain the number of wage earners working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one part of the year to another were disregarded, and no attention was paid to the fact that a few wage earners might have hours differing from those of the majority. All the wage earners of each establishment are therefore counted in the class within which the establishment itself falls. In most establishments, however, practically all the wage earners work the same number of hours, so that the figures give a substantially correct representation of the hours of labor.

**Capital (amount actually invested).**—The instructions on the schedule for securing data relating to capital were as follows:

"The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises."

These instructions were identical with those employed at the censuses of 1914 and 1909. The data compiled in respect to capital, however, at both censuses, as well as at all preceding censuses of manufactures, have been so defective as to be of little value except as indicating general conditions. In fact, it has been repeatedly recommended by the census authorities that this inquiry be omitted from the schedule. While there are some establishments whose accounting systems are such that an accurate return for capital could be made, this is not true of the great majority, and the figures therefore do not show the actual amount of capital invested.

**Materials.**—The statistics as to cost of materials relate to the materials used during the year, which may be more or less than the materials purchased during the year. The term "materials" covers fuel, rent of power and heat, mill supplies, and containers, as well as materials which form a constituent part of the product.

**Rent and taxes.**—The taxes include certain Federal taxes and state, county, and local taxes. Under "Federal taxes" there are included the internal revenue tax on manufactures (tobacco, beverages, etc.), excise taxes when included in values reported for products, corporation capital stock tax, and corporation income tax, but not the income tax for individuals and partners.

**Value of products.**—The amounts given under this heading represent the selling value or price at the factory of all products manufactured during the year, which may differ from the value of the products sold.

**Value added by manufacture.**—The value of products is not always a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing processes carried on in the industry itself. Another part, and often by far the larger one, represents the value of the materials used. For many purposes, therefore, the best measure of the importance of an industry, from a manufacturing standpoint, is the value created by the manufacturing operations carried on within the industry. This value is calculated by deducting the cost of the materials used from the value of the products. The figure thus obtained is termed in the census reports "value added by manufacture."

**Cost of manufacture and profits.**—The census data do not show the entire cost of manufacture, and consequently can not be used for the calculation of profits. No account has been taken of depreciation or interest, rent of offices and buildings other than factory or works, insurance, ordinary repairs, advertising, and other sundry expenses.

**Primary horsepower.**—This item represents the total primary power equipment of the manufacturing establishments plus the amount of power, principally electric, rented from other concerns. It does not cover the power of electric motors taking their current from dynamos driven by primary power machines operated by the same establishment, because the inclusion of such power would obviously result in duplication. The figures for primary horsepower represent the rated capacity of the engines, motors, etc., and not the amount of power in actual daily use.

**Fuel.**—Statistics of the quantity of fuel used are shown only for anthracite and bituminous coal, coke, fuel oils, gasoline and other volatile oils, and gas, and represent the quantity used during the year. As only the principal kinds of fuel are shown, comparison as to the total cost of all fuels is impracticable.

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# FOREST PRODUCTS.

By A. H. O. ROLLE.

## INTRODUCTION.

This report presents statistics for the principal manufacturing industries using crude forest products as materials. The statistics are divided into four chapters and comprise the following:

- (1) The lumber industry;
- (2) Pulp-wood consumption and wood-pulp production;
- (3) Forest products consumed in the manufacture of dyestuffs and extracts, and in tanning and wood distillation; and
- (4) Turpentine and rosin.

General statistics covering capital invested, persons engaged, cost of materials, and value of products, as well as special statistics of materials, kind and quantity of products are given for the lumber industry group and for turpentine and rosin. For the other industries, however, only special data pertaining principally to materials are shown, general statistics being presented in the report for the group in which the particular industry falls when classified according to the principal product.

In order that the magnitude of the forest products industries may be more readily visualized, a summary has been prepared showing the value of products of establishments in the lumber industry group and in turpentine and rosin, also the cost of forest products used as materials in other specified industries.

INDUSTRY.	Amount.
Lumber and timber products <sup>1</sup> ..... value of products..	\$1,393,033,897
Lumber, planing mill products..... value of products..	500,438,258
Boxes, wooden packing..... value of products..	177,318,454
Turpentine and rosin..... value of products..	53,051,294
Pulpwood..... cost of wood..	87,386,083
Dyestuffs and extracts..... cost of wood, bark, etc..	12,133,799
Tanning materials..... cost of wood, bark, etc..	12,027,687
Wood distillation..... cost of wood..	9,556,046

<sup>1</sup> Including custom sawmills.

The value of forest products produced on farms was collected in connection with the census of agriculture. Although this report covers manufacturing industries only, these data are particularly interesting. The following statement shows the value of forest products produced on farms in the United States for 1919 and 1909:

ITEM.	1919	1909
Farms reporting forest products.....	2,014,696	2,409,853
Per cent of all farms.....	31.2	37.9
Value of all forest products.....	\$394,321,828	\$195,306,283
Value of products sold.....	217,716,046	92,524,205
Value of products used on farms.....	176,605,782	102,782,078

It is safe to assume that a considerable part of the forest products sold on farms was used as materials in the manufacturing industries covered in these statistics.

## CHAPTER I.—THE LUMBER INDUSTRY.

### GENERAL STATISTICS.

**General character of the industry.**—The plan adopted at the Thirteenth Census for presenting statistics for the lumber industry has been followed generally in this report. Four classes of establishments are included: (1) Lumber and timber products, which includes logging camps, stave and heading mills, veneer mills, merchant sawmills, and dependent planing mills, that is, planing mills operated in conjunction with sawmills; (2) lumber, planing-mill products, which covers planing mills not connected with sawmills, or independent planing mills; (3) boxes, wooden packing; and (4) custom sawmills.

Establishments manufacturing products from materials which they owned and large establishments doing contract logging or sawing were classed as merchant, while small establishments engaged primarily in sawing lumber from logs furnished by others were classed as custom. Data for custom sawmills are included in Table 1, and in Tables 15 to 72, inclusive, except Table 17. Detailed statistics for custom sawmills are shown in Table 75.

**Summary.**—Statistics for 1919 for the different branches of the lumber industry, which are included in this report, are presented in Table 1. The lumber and timber products branch is by far the most important and furnished about two-thirds of the total value of the products of the entire industry. This branch, however, includes not only logging and sawing but also dependent planing mills and other remanufactures when operated in conjunction with sawmills. The independent planing mills and box factories are included because they are closely connected with the lumber and timber products branch, planing-mill work and box making being frequently carried on in connection with the manufacture of lumber.

**Importance and growth of the industry.**—Table 2 gives comparative statistics for the industry for each census since 1879 and the percentages of increase or decrease for the six census periods. The statistics are not strictly comparable for the reasons that prior to 1914 window and door screens were included with planing-mill products, also it is probable that for 1879 capital invested in timber lands and standing timber was included in the capital reported as invested in manufacturing establishments. In addition to the instructions for securing data relating to capital as quoted in the "Explanation of terms," the schedule used for collecting data for lumber and timber products specifically called for capital in-

vested in land, buildings, machinery, and tools, in logging and timber plants including live stock, booms, chains, canals and chutes, logging railways and equipment, pull boats, etc. Capital invested in timberlands or standing timber, however, was called for only under other specified inquiries, and since 1879 capital so invested has been reported separately and excluded from these statistics.

The large increases shown for 1919 for salaries and wages, cost of materials, and value of products are due to the sharp advance in wages and in the cost of commodities during and following the World War, consequently these figures can not properly be used to measure the growth of the industry. In fact, the production of lumber shows a decrease from 1914 to 1919. The average number of wage earners employed and the primary horsepower are perhaps the truest indexes of the development in this industry. The addition of the Federal income tax since 1914 will account for the increase in "Rent and taxes."

**States, ranked by value of products.**—In Table 3 is shown the rank of the lumber-manufacturing states in 1919. The figures presented include the three branches of the lumber industry and cover merchant establishments only. Considering the industry as a whole, Michigan was the leading state in the census years 1879, 1889, and 1899, New York in 1904, and Washington in 1909, 1914, and 1919.

**Persons engaged in the industry.**—Table 4 shows for 1919, 1914, and 1909 the number of persons engaged in the various branches of the industry distributed by classes and sex, the average number of wage earners also being shown separately for persons 16 years of age and over and persons under 16 years of age. The age classification of the average number of wage earners is an estimate obtained by the method described in the "Explanation of terms." The classification by sex for 1919 was reported separately, except for lumber and timber products. For that industry for 1919 and for all industries for 1914 and 1909 the classification by sex was obtained by the same method as described in the "Explanation of terms" for the distribution by age.

**Wage earners, by months.**—The statistics for wage earners in Table 5 show the steadiness of employment or the reverse, during the several census years, and reflect the industrial conditions as they affect labor.

The lumber industry in many sections of the United States is seasonal, the logging and transporting of the logs to the mills or railroads or to rivers or streams

for the drive to the mills being done during the winter months, and the mills being operated more generally during the spring, summer, and fall. In other sections the logging operations, as well as the sawing, are carried on the entire year without any appreciable difference in the activities. The extent to which climatic and other conditions affected the activity in this industry in the various states is brought out by the statistics.

**Wage earners in logging camps and mills.**—The seasonal conditions mentioned in the preceding paragraph pertain particularly to the logging and sawmill industry, hence separate statistics for wage earners are presented in Table 6.

**Prevailing hours of labor.**—Figures presented in Table 7 indicate a tendency toward the shortening of the working-day of the wage earner. In the lumber and timber products industry in the Western states wage earners in important plants usually work in 8-hour shifts, while the 10-hour shift is more common in the Eastern and Southern states. Many of the wage earners, particularly in the smaller or less important establishments, work irregular hours, and the classification of employees as shown in this table is of questionable value.

**Size of establishments, by average number of wage earners.**—The statistics presented in Table 8 show that the number of establishments employing no wage earners predominate in this industry, and in many of the states the number of small establishments

increased from 1914 to 1919. The main reasons for such increase may be the increased prices of the products and also the shutting down of large establishments on account of diminution of the timber supply. The increased prices probably induced small operators to engage in the industry when larger plants were forced to shut down for lack of a sufficient supply of raw material.

**Size of establishments, by value of products.**—The statistics given in Table 9 show the tendency of the industry to become concentrated in large establishments, or the reverse.

**Character of ownership.**—Table 10 shows the number of wage earners employed in establishments operated by individuals, corporations, and others. While the greatest number of establishments are operated by individuals, corporate form of ownership is by far the most important, which is clearly indicated by the statistics presented in this table.

**Number and horsepower of types of prime movers** (Table 11).—The power accounted for in these statistics does not include locomotives or traction engines, but represents the power employed in the manufacturing plants. Hoisting engines and other power reported as employed in logging is included, but all power used in logging, apparently, was not reported.

**Fuel consumed.**—The principal fuel used in this industry was mill waste, the quantity of which was not reported. The quantity and kind of other fuel used is shown in Table 12.

TABLE 1.—SUMMARY FOR THE LUMBER INDUSTRY, INCLUDING CUSTOM SAWMILLS: 1919.

	Aggregate.	MERCHANT ESTABLISHMENTS.				Custom sawmills.
		All branches.	Lumber and timber products. <sup>1</sup>	Lumber, planing-mill products (not including planing mills connected with sawmills).	Boxes, wooden packing (except cigar boxes).	
Number of establishments.....	37,964	32,568	26,119	5,309	1,140	5,396
Persons engaged.....	702,555	692,166	538,788	106,481	46,897	10,389
Proprietors and firm members.....	43,804	36,627	31,348	4,430	849	7,177
Salaried employees.....	45,232	45,193	26,495	15,095	3,603	39
Wage earners (average number).....	613,519	610,346	480,945	86,956	42,445	3,173
Primary horsepower.....	3,053,572	2,922,656	2,358,937	419,671	144,048	130,916
Capital.....	\$1,836,026,964	\$1,828,772,648	\$1,357,991,571	\$361,848,079	\$108,932,998	\$7,254,316
Salaries and wages.....	713,389,673	711,326,048	545,347,364	120,512,866	45,465,818	2,063,625
Salaries.....	93,129,892	93,119,246	55,928,273	28,536,340	8,654,633	10,616
Wages.....	620,259,811	618,206,802	489,419,091	91,976,526	36,811,185	2,053,009
Paid for contract work.....	39,290,629	39,282,883	37,546,478	1,102,507	633,898	7,746
Rent and taxes.....	54,753,015	54,680,328	39,763,736	9,898,402	5,018,190	72,687
Cost of materials.....	873,908,924	873,172,375	470,960,488	299,265,652	102,946,235	736,549
Value of products.....	2,071,290,609	2,065,728,125	1,387,471,413	500,438,258	177,818,454	5,562,484
Value added by manufacture <sup>2</sup> .....	1,197,381,685	1,192,555,750	916,510,925	201,172,606	74,872,219	4,825,985

<sup>1</sup> Includes logging camps and mills manufacturing lumber, cooperage stock, shingles, lath, and veneers; also planing mills operated in conjunction with sawmills.

<sup>2</sup> Value of products less cost of materials.

TABLE 2.—COMPARATIVE SUMMARY, MERCHANT ESTABLISHMENTS: 1919, 1914, 1909, 1904, 1899, 1889, AND 1879.

	1919	1914	1909	1904	1899	1889	1879	PER CENT OF INCREASE <sup>1</sup>					
								1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
<b>ALL BRANCHES.</b>													
Number of establishments.....	32,508	34,244	40,071	25,153	28,133	26,013	28,851	-4.9	-15.8	61.7	-10.6	4.5	-6.7
Persons engaged.....	692,166	694,303	784,980	593,342	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-0.3	-11.6	32.3	.....	.....	.....
Proprietors and firm members..	36,627	38,066	48,825	30,738	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-6.0	-20.2	58.8	.....	.....	.....
Salaried employees.....	45,193	40,789	41,145	30,038	20,940	28,248	( <sup>2</sup> )	10.8	-0.9	37.0	43.4	-25.9	.....
Wage earners (average number).	610,340	614,548	695,019	532,566	508,706	530,937	193,199	-0.7	-11.6	30.5	4.7	-5.2	177.9
Primary horsepower.....	2,922,656	2,734,014	2,840,082	1,886,024	1,658,594	1,105,875	( <sup>2</sup> )	6.9	-3.7	50.5	13.7	42.3	.....
Capital.....	\$1,828,772,648	\$1,250,072,727	\$1,176,075,407	\$733,707,720	\$541,594,955	\$531,046,007	\$224,840,107	46.3	6.2	60.4	35.5	2.0	136.2
Salaries and wages.....	711,320,048	373,987,476	360,166,003	277,571,851	207,109,909	183,006,841	( <sup>2</sup> )	90.2	2.1	31.9	34.0	12.6	.....
Salaries.....	93,119,246	53,855,617	47,427,000	31,737,491	18,714,931	18,809,851	( <sup>2</sup> )	72.9	13.0	49.4	49.6	-0.5	.....
Wages.....	618,206,802	320,131,859	318,730,207	245,834,360	188,394,978	165,000,000	40,033,887	63.1	0.4	29.7	30.5	14.1	236.3
Paid for contract work.....	30,282,883	33,764,310	( <sup>2</sup> )	36,358,489	( <sup>2</sup> )	9,647,464	( <sup>2</sup> )	16.3	.....	.....	.....	.....	.....
Rent and taxes.....	54,080,328	17,222,716	( <sup>2</sup> )	8,147,425	( <sup>2</sup> )	4,440,488	( <sup>2</sup> )	217.5	.....	.....	.....	.....	.....
Cost of materials.....	873,172,375	519,018,961	508,117,579	300,324,949	364,953,841	322,712,203	199,256,320	68.2	2.1	41.0	-1.3	13.1	62.6
Value of products.....	2,065,728,125	1,109,549,618	1,150,288,747	884,267,009	700,992,300	647,693,674	319,720,635	85.2	-4.0	30.7	16.2	17.6	102.4
Value added by manufacture <sup>4</sup> .....	1,192,555,750	590,530,657	648,011,168	523,942,000	396,028,519	324,381,471	120,464,315	101.9	-8.9	23.7	32.3	22.1	169.3
<b>LUMBER AND TIMBER PRODUCTS.</b>													
Number of establishments.....	20,119	27,229	33,090	10,121	23,043	22,607	25,758	-4.1	-17.7	73.1	-17.0	1.9	-12.2
Persons engaged.....	538,788	596,116	613,001	447,093	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	0.5	-12.6	37.2	.....	.....	.....
Proprietors and firm members..	31,348	32,840	41,489	21,049	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-4.5	-20.8	72.5	.....	.....	.....
Salaried employees.....	26,495	23,490	24,034	18,481	14,225	20,367	( <sup>2</sup> )	12.8	-5.8	34.9	29.9	-30.2	.....
Wage earners (average number)	480,945	479,786	547,178	404,563	413,257	444,008	148,200	0.2	-12.3	35.3	-2.1	-6.9	199.4
Primary horsepower.....	2,358,937	2,192,392	2,316,634	1,490,816	1,375,139	960,865	821,028	7.6	-5.4	55.4	8.4	43.1	16.9
Capital.....	\$1,357,991,571	\$916,574,231	\$863,870,850	\$517,018,890	\$400,707,092	\$397,750,201	\$181,465,362	48.2	6.1	67.1	29.0	0.7	119.2
Salaries and wages.....	545,347,304	272,634,082	268,409,862	202,814,741	( <sup>2</sup> )	128,459,636	( <sup>2</sup> )	100.5	1.4	32.3	.....	.....	.....
Salaries.....	55,928,273	32,057,520	19,865,002	10,865,002	( <sup>2</sup> )	11,200,209	( <sup>2</sup> )	74.5	8.5	48.7	.....	.....	.....
Wages.....	489,419,031	239,076,562	238,866,800	182,949,640	147,051,880	117,259,427	31,893,008	103.9	0.5	30.6	23.7	26.2	287.7
Paid for contract work.....	37,546,478	31,790,233	( <sup>2</sup> )	34,956,938	( <sup>2</sup> )	9,647,464	( <sup>2</sup> )	18.1	.....	.....	.....	.....	.....
Rent and taxes.....	39,703,736	12,302,400	( <sup>2</sup> )	5,454,537	( <sup>2</sup> )	4,440,488	( <sup>2</sup> )	223.2	.....	.....	.....	.....	.....
Cost of materials.....	470,900,488	291,951,873	265,559,595	183,708,290	242,617,767	203,540,860	146,312,937	67.0	6.2	44.0	-24.3	19.2	39.1
Value of products.....	1,387,471,413	715,310,333	753,388,368	579,777,310	555,042,605	437,808,042	233,608,896	94.0	-5.1	29.9	4.5	26.8	87.4
Value added by manufacture <sup>4</sup> .....	916,510,925	433,358,460	487,828,773	396,069,014	312,424,838	234,358,076	87,295,949	111.5	-11.2	23.2	26.8	33.3	168.5
<b>LUMBER, PLANING-MILL PRODUCTS.</b>													
Number of establishments.....	5,309	5,841	6,402	5,009	4,108	3,670	2,491	-0.1	-3.8	27.8	19.3	14.4	47.3
Persons engaged.....	106,481	115,969	132,511	113,037	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-8.2	-12.5	17.2	.....	.....	.....
Proprietors and firm members..	4,430	5,131	6,247	5,618	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-13.7	-17.9	11.2	.....	.....	.....
Salaried employees.....	15,095	14,624	13,872	0,745	5,677	0,065	( <sup>2</sup> )	3.2	5.4	42.3	71.7	-18.5	.....
Wage earners (average number)	86,956	96,214	112,392	97,674	78,510	79,923	37,187	-9.6	-14.4	15.1	32.0	-8.0	114.9
Primary horsepower.....	410,671	414,817	410,950	300,857	228,731	178,094	( <sup>2</sup> )	1.2	0.9	32.6	35.5	28.4	.....
Capital.....	\$301,848,079	\$266,804,640	\$257,748,437	\$177,145,734	\$118,048,550	\$120,271,440	\$38,070,593	35.6	3.5	45.5	48.9	-1.1	215.9
Salaries and wages.....	120,512,866	79,944,771	79,589,063	60,673,837	( <sup>2</sup> )	48,670,080	( <sup>2</sup> )	50.7	0.4	31.2	.....	.....	.....
Salaries.....	28,536,340	17,995,541	15,053,254	9,960,230	( <sup>2</sup> )	6,748,224	( <sup>2</sup> )	58.6	19.5	51.1	.....	.....	.....
Wages.....	91,976,526	61,949,230	64,536,400	50,713,007	32,621,704	42,221,856	14,431,654	48.5	-0.0	27.3	55.5	-22.7	192.6
Paid for contract work.....	1,102,507	1,643,966	( <sup>2</sup> )	1,195,842	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-32.9	.....	.....	.....	.....	.....
Rent and taxes.....	9,898,402	3,816,545	( <sup>2</sup> )	2,138,261	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	159.4	.....	.....	.....	.....	.....
Cost of materials.....	299,265,632	184,227,441	196,079,522	143,137,602	99,568,501	104,026,534	45,268,402	62.4	-6.0	37.0	43.8	-5.1	131.3
Value of products.....	500,438,258	307,672,478	327,397,891	247,441,956	167,786,122	183,681,552	73,424,651	62.7	-6.0	32.3	47.5	-8.7	150.2
Value added by manufacture <sup>4</sup> .....	201,172,608	123,445,037	131,318,369	104,304,294	68,217,621	78,754,718	28,156,219	63.0	-0.0	25.9	52.9	-13.4	179.7
<b>BOXES, WOODEN PACKING.</b>													
Number of establishments.....	1,140	1,174	1,179	1,023	892	680	602	-2.9	-0.4	15.2	14.7	40.3	5.6
Persons engaged.....	40,897	42,218	38,877	33,212	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	11.1	8.6	17.1	.....	.....	.....
Proprietors and firm members..	849	969	1,089	1,071	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	-14.7	-8.6	1.7	.....	.....	.....
Salaried employees.....	3,893	2,675	2,339	1,812	1,038	916	( <sup>2</sup> )	34.7	14.4	29.1	74.6	13.3	87.4
Wage earners (average number)	42,445	38,548	35,440	30,320	21,999	13,000	7,722	10.1	8.7	16.9	37.9	69.1	68.4
Primary horsepower.....	144,048	120,805	112,498	85,951	54,724	50,016	( <sup>2</sup> )	13.6	12.7	30.9	57.1	103.3	.....
Capital.....	\$108,932,998	\$66,693,850	\$55,056,120	\$39,543,096	\$21,939,300	\$13,018,456	\$5,304,212	63.3	21.1	39.2	80.2	68.5	145.4
Salaries and wages.....	45,465,818	22,008,623	18,167,378	14,083,278	( <sup>2</sup> )	6,477,125	( <sup>2</sup> )	106.0	21.1	29.0	.....	.....	.....
Salaries.....	8,654,633	3,802,550	2,831,386	1,912,109	( <sup>2</sup> )	801,418	( <sup>2</sup> )	127.6	34.3	48.1	.....	.....	.....
Wages.....	30,811,185	18,206,073	15,335,992	12,171,169	7,821,388	5,615,707	2,769,135	102.2	18.7	26.0	55.6	39.3	102.3
Paid for contract work.....	633,898	330,111	( <sup>2</sup> )	205,700	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	92.0	.....	.....	.....	.....	.....
Rent and taxes.....	5,013,190	1,103,031	( <sup>2</sup> )	554,627	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )	354.7	.....	.....	.....	.....	.....
Cost of materials.....	102,940,235	52,839,647	46,478,462	33,478,991	22,777,573	14,244,503	7,074,921	94.8	13.7	38.8	47.0	59.9	86.6
Value of products.....	177,818,454	85,566,807	75,342,488	57,047,743	38,103,033	25,513,180	12,687,068	105.4	14.9	32.1	49.5	49.6	101.1
Value added by manufacture <sup>4</sup> .....	74,872,219	33,727,100	28,864,026	23,598,752	15,386,000	11,208,677	5,012,147	122.0	16.8	22.5	53.2	36.5	124.8

<sup>1</sup> A minus sign (-) denotes decrease.<sup>2</sup> Figures not available.<sup>3</sup> Exclusive of internal revenue.<sup>4</sup> Value of products less cost of materials.<sup>5</sup> Total horsepower.

# THE LUMBER INDUSTRY.

TABLE 3.—STATES, RANKED BY VALUE OF PRODUCTS: 1919.

STATE.	Number of establishments.	WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.			STATE.	Number of establishments.	WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.		
		Average number.	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.			Average number.	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	32,568	610,346	100.0	...	2,065,728	100.0	...	1,192,556	100.0	...	Massachusetts	465	7,050	1.2	29	33,409	1.6	26	15,698	1.3	28
Washington	1,232	56,018	9.2	1	234,825	11.4	1	141,722	11.9	1	Idaho	213	8,431	1.4	26	30,785	1.5	27	21,877	1.8	22
Louisiana	579	44,626	7.3	2	130,460	6.3	2	87,565	7.3	2	South Carolina	670	12,732	2.1	20	26,864	1.3	28	17,326	1.5	25
California	566	24,829	4.1	8	99,052	4.8	3	54,540	4.6	6	New Hampshire	393	7,131	1.2	28	24,210	1.2	29	12,556	1.1	29
Oregon	706	24,578	4.0	9	95,264	4.6	4	57,740	4.8	5	New Jersey	368	4,105	0.7	31	22,002	1.1	30	8,595	0.7	31
Mississippi	1,504	37,435	6.1	3	94,501	4.6	5	64,051	5.4	3	Maryland	497	4,995	0.8	30	18,636	0.9	31	8,632	0.7	30
Arkansas	1,562	31,884	5.2	4	91,852	4.4	6	59,403	5.0	4	Iowa	144	3,549	0.6	34	17,893	0.9	32	8,300	0.7	32
Michigan	618	21,660	3.5	11	88,891	4.3	7	46,442	3.9	8	Vermont	457	3,948	0.7	32	13,142	0.6	33	7,227	0.6	34
Wisconsin	605	28,822	4.7	5	88,883	4.3	8	49,800	4.2	7	Montana <sup>1</sup>	183	3,869	0.6	33	12,197	0.6	34	8,210	0.7	33
New York	1,526	10,721	1.8	15	82,508	4.0	9	38,432	3.2	12	Connecticut	292	1,773	0.3	36	10,143	0.5	35	4,693	0.4	36
North Carolina	2,957	25,847	4.2	7	69,554	3.4	10	44,543	3.7	9	Oklahoma <sup>2</sup>	201	2,493	0.4	35	8,054	0.4	36	5,140	0.4	35
Pennsylvania	1,935	16,295	2.7	17	67,713	3.3	11	36,174	3.0	13	Colorado	181	1,294	0.2	37	4,197	0.2	37	2,688	0.2	37
Alabama	1,774	27,097	4.4	6	61,317	3.0	12	41,288	3.5	10	Kansas <sup>2</sup>	59	799	0.1	41	3,933	0.2	38	1,666	0.1	40
Texas	606	20,239	3.3	13	61,105	3.0	13	38,535	3.2	11	Rhode Island	63	706	0.1	42	2,977	0.1	39	1,490	0.1	42
Illinois	495	11,287	1.8	22	59,775	2.9	14	25,759	2.2	19	New Mexico	56	1,286	0.2	38	2,971	0.1	40	2,213	0.2	38
Virginia	2,110	20,533	3.4	12	56,393	2.7	15	32,165	2.7	15	Nebraska	39	526	0.1	44	2,749	0.1	41	1,228	0.1	43
Ohio	990	9,504	1.6	25	53,397	2.6	16	22,496	1.9	21	Arizona	26	1,039	0.2	39	2,679	0.1	42	1,835	0.2	39
Tennessee	1,570	10,314	2.7	16	52,788	2.6	17	30,015	2.5	16	South Dakota	73	820	0.1	40	2,632	0.1	43	1,626	0.1	41
Minnesota	366	15,485	2.5	18	52,580	2.5	18	26,691	2.2	18	Delaware	90	701	0.1	43	1,716	0.1	44	985	0.1	45
Florida	552	23,350	3.8	10	50,409	2.4	19	32,633	2.7	14	Utah <sup>2</sup>	113	366	0.1	45	1,338	0.1	45	857	0.1	46
West Virginia	773	13,665	2.2	19	46,314	2.2	20	26,383	2.5	17	Wyoming	83	361	0.1	46	1,229	0.1	46	1,002	0.1	44
Georgia	1,656	16,841	2.8	14	43,051	2.1	21	24,679	2.1	20	District of Columbia	9	244	(*)	47	860	(*)	47	478	(*)	47
Maine	712	11,492	1.9	21	36,389	1.8	22	21,261	1.8	23	All other <sup>4</sup>	21	352	(*)	...	1,728	0.1	...	779	0.1	...
Indiana	736	7,360	1.2	27	35,043	1.7	23	16,242	1.4	27											
Kentucky	1,045	9,080	1.6	24	33,836	1.6	24	17,837	1.5	24											
Missouri	607	10,005	1.6	25	33,655	1.6	25	17,759	1.5	25											

<sup>1</sup> Excludes statistics for 1 establishment to avoid disclosure of individual operations.  
<sup>2</sup> Excludes statistics for 2 establishments to avoid disclosure of individual operations.  
<sup>3</sup> Less than one-tenth of 1 per cent.  
<sup>4</sup> Includes establishments distributed as follows: Kansas, 2; Montana, 1; Nevada, 4; North Dakota, 10; Oklahoma, 2; and Utah, 2.

TABLE 4.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.

CLASS.	Census year.	ALL BRANCHES.						LUMBER AND TIMBER PRODUCTS.						LUMBER, PLANING-MILL PRODUCTS.						BOXES, WOODEN PACKING.					
		Total.	Male.	Female.	Per cent of total.		Total.	Male.	Female.	Per cent of total.		Total.	Male.	Female.	Per cent of total.		Total.	Male.	Female.	Per cent of total.					
					Male.	Female.				Male.	Female.				Male.	Female.				Male.	Female.				
All classes	1919	692,106	673,780	18,416	97.3	2.7	538,788	530,557	8,231	98.5	1.5	106,481	101,359	5,122	95.2	4.8	46,837	41,834	5,063	89.2	10.8				
	1914	694,303	685,721	8,582	98.8	1.2	536,116	533,281	2,835	99.5	0.5	115,999	112,948	3,021	97.4	2.6	42,218	39,492	2,726	93.5	6.5				
	1909	784,989	777,030	7,959	99.0	1.0	613,001	610,129	3,475	99.4	0.6	132,511	129,945	2,566	98.1	1.9	38,577	36,559	1,918	95.1	4.9				
Proprietors and officials	1919	58,824	57,892	932	98.4	1.6	31,348	30,931	417	98.7	1.3	11,225	10,933	292	97.4	2.6	2,885	2,805	80	97.2	2.8				
	1914	59,998	59,294	704	98.8	1.2	43,678	43,146	532	99.0	1.0	11,124	10,936	188	98.3	1.7	2,271	2,212	59	97.4	2.6				
	1909	68,105	67,480	625	99.0	1.0	53,950	53,488	462	99.1	0.9	11,974	11,801	173	98.6	1.4	2,241	2,197	44	98.0	2.0				
Proprietors and firm members	1919	36,627	36,029	598	98.4	1.6	32,840	32,466	374	98.9	1.1	5,181	5,004	177	97.5	2.5	995	957	38	96.2	3.8				
	1914	38,966	38,427	539	98.6	1.4	32,840	32,466	374	98.9	1.1	5,181	5,004	177	97.5	2.5	995	957	38	96.2	3.8				
	1909	48,825	48,249	576	98.8	1.2	41,489	41,070	419	99.0	1.0	6,247	6,124	123	98.0	2.0	1,089	1,055	34	96.9	3.1				
Salaried officers of corporations	1919	8,419	8,195	224	97.0	3.0	4,406	4,288	118	97.3	2.7	3,152	3,051	101	96.8	3.2	861	826	35	95.9	4.1				
	1914	6,890	6,705	185	98.2	1.8	3,438	3,391	47	98.6	1.4	2,898	2,840	58	98.0	2.0	554	534	20	96.4	3.6				
	1909	6,616	6,523	93	98.0	1.4	3,574	3,536	38	98.9	1.1	2,583	2,518	65	98.2	1.8	479	469	10	97.9	2.1				
Superintendents and managers	1919	13,778	13,698	80	99.4	0.6	8,960	8,935	25	99.7	0.3	3,643	3,603	40	98.9	1.1	1,175	1,160	15	98.7	1.3				
	1914	11,112	11,102	10	99.9	0.1	7,295	7,289	6	99.9	0.1	3,095	3,092	3	99.9	0.1	722	721	1	99.9	0.1				
	1909	12,724	12,714	10	99.9	0.1	8,887	8,882	5	99.9	0.1	3,164	3,159	5	99.8	0.2	673	673	0	100.0	0.0				
Clerks and other subordinate salaried employees	1919	22,096	16,895	6,601	71.3	28.7	13,129	9,860	3,269	75.1	24.9	8,300	5,611	2,689	67.6	32.4	1,567	924	643	59.0	41.0				
	1914	22,787	18,780	4,007	82.4	17.6	12,757	11,215	1,542	87.9	12.1	8,631	6,539	2,092	75.8	24.2	1,399	1,026	373	73.3	26.7				
	1909	21,805	18,088	3,717	83.0	17.0	12,473	10,949	1,524	87.8	12.2	8,145	6,291	1,854	77.2	22.8	1,187	848	339	71.4	28.6				
Wage earners (average number)	1919	610,346	599,403	10,883	98.2	1.8	480,945	476,543	4,402	99.1	0.9	86,956	84,815	2,141	97.5	2.5	42,445	38,105	4,340	89.8	10.2				
	1914	614,548	610,647	3,901	99.4	0.6	479,786	478,920	866	99.8	0.2	96,214	95,473	741	99.2	0.8	38,548	36,254	2,294	94.1	6.0				
	1909	695,019	691,450	3,569	99.5	0.5	547,178	545,689	1,489	99.7	0.3	112,392	111,853	539	99.5	0.5	35,449	33,914	1,535	95.7	4.3				
16 years of age and over	1919	608,006	597,890	10,746	98.2	1.8	480,268	475,015	5,253	99.1	0.9	86,515	84,393	2,122	97.5	2.5	41,823	37,552	4,271	89.8	10.2				
	1914	611,128	607,447	3,681	99.4	0.6	478,079	477,301	778	99.8	0.2	95,692	94,976	716	99.3	0.7	37,357	35,170	2,187	94.1	5.9				
	1909	680,086	685,746	3,340	99.5	0.5	543,951	542,547	1,404	99.7	0.3	111,310	110,803	507	99.5	0.5	33,825	32,393	1,432	95.8	4.2				
Under 16 years of age	1919	1,740	1,603	137	92.1	7.9	677	628	49	92.8	7.2	441	422	19	95.7	4.3	622	553	69	88.9	11.1				
	1914	3,420	3,200	22																					

TABLE 5.—WAGE EARNERS, BY MONTHS AND BY STATES: 1919.

[The month of maximum employment for each industry is indicated by bold-faced figures and that of minimum employment by *italic* figures.]

STATE.	Average number employed during year.	NUMBER EMPLOYED ON 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY.												Per cent minimum is of maximum.		
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.			
UNITED STATES.																
All branches:																
1919.....	610,346	<i>544,060</i>	<b>543,876</b>	500,096	500,264	575,464	584,646	603,757	632,385	661,150	682,567	684,537	<b>680,451</b>	679,384	78.8	
Male.....	599,463	<i>533,186</i>	<b>533,243</b>	550,304	549,477	564,592	573,735	592,861	621,627	650,250	671,420	673,517	<b>673,517</b>	679,384	78.5	
Female.....	10,883	<i>10,924</i>	<b>10,633</b>	10,692	10,787	10,872	10,911	10,896	10,758	10,900	11,147	11,020	<b>11,020</b>	11,067	95.4	
1914.....	614,548	<i>617,875</i>	<b>625,354</b>	640,796	639,768	<b>647,227</b>	641,764	634,585	622,276	603,516	589,005	565,795	<b>565,795</b>	568,615	84.5	
1909.....	695,019	<i>649,239</i>	<b>661,690</b>	685,133	681,354	680,657	687,597	680,509	692,609	714,963	732,790	739,160	<b>739,160</b>	728,481	87.8	
LUMBER AND TIMBER PRODUCTS:																
1919.....	480,045	<i>427,808</i>	<b>428,806</b>	444,808	440,965	450,884	454,835	469,977	494,725	523,450	543,075	543,298	<b>543,298</b>	548,655	78.0	
Male.....	476,543	<i>423,406</i>	<b>424,410</b>	440,470	430,565	448,483	450,433	465,575	490,322	519,048	538,069	538,890	<b>538,890</b>	544,247	77.8	
Female.....	4,402	<i>4,398</i>	<b>4,396</b>	4,338	4,400	4,401	4,402	4,402	4,403	4,404	4,404	4,404	<b>4,404</b>	4,408	99.7	
1914.....	470,786	<i>453,367</i>	<b>494,730</b>	507,229	502,607	507,876	500,581	493,776	482,532	465,920	455,178	436,895	<b>436,895</b>	421,735	83.0	
LUMBER, PLANING-MILL PRODUCTS:																
1919.....	86,066	<i>74,400</i>	<b>74,562</b>	75,377	78,617	83,346	87,636	91,450	93,768	94,483	96,074	97,035	<b>97,035</b>	96,915	76.6	
Male.....	84,815	<i>72,598</i>	<b>72,403</b>	73,430	76,588	81,224	85,507	89,167	91,591	92,205	93,702	94,760	<b>94,760</b>	94,706	76.3	
Female.....	2,141	<i>2,101</i>	<b>2,159</b>	1,938	2,029	2,122	2,129	2,283	2,177	2,278	2,372	2,275	<b>2,275</b>	2,209	82.1	
1914.....	96,214	<i>91,452</i>	<b>92,207</b>	93,717	96,844	99,049	100,363	101,228	101,147	99,079	96,080	92,916	<b>92,916</b>	89,336	83.3	
BOXES, WOODEN PACKING:																
1919.....	42,445	<i>41,849</i>	<b>40,707</b>	40,751	40,689	41,234	42,175	42,330	43,802	43,217	43,418	44,204	<b>44,204</b>	44,881	90.6	
Male.....	38,105	<i>37,422</i>	<b>36,870</b>	36,895	36,824	36,885	37,795	38,110	39,714	38,939	38,989	39,867	<b>39,867</b>	40,441	89.8	
Female.....	4,340	<i>4,427</i>	<b>4,337</b>	4,356	4,353	4,349	4,380	4,220	4,088	4,278	4,429	4,337	<b>4,337</b>	4,440	94.1	
1914.....	38,548	<i>38,050</i>	<b>38,411</b>	39,850	40,317	40,302	40,320	40,581	38,507	38,517	37,147	35,984	<b>35,984</b>	36,404	88.0	
STATES.																
Alabama.....	27,097	24,681	23,634	24,715	24,806	25,753	24,216	25,380	26,720	29,722	31,433	31,876	<b>33,878</b>	33,878	70.1	
Arizona.....	1,080	790	659	621	813	1,185	1,211	1,200	1,261	1,200	1,220	1,157	<b>1,052</b>	1,052	48.1	
Arkansas.....	31,884	27,794	27,346	27,114	27,595	29,002	29,447	32,085	35,820	37,827	36,891	35,584	<b>36,097</b>	36,097	71.7	
California.....	24,820	17,711	17,673	18,954	23,385	26,071	27,658	29,292	28,784	28,240	28,370	27,358	<b>23,643</b>	23,643	60.3	
Colorado.....	1,294	1,008	969	867	915	1,140	1,507	1,600	1,568	1,558	1,589	1,461	<b>1,362</b>	1,362	53.2	
Connecticut.....	1,773	1,752	1,493	1,714	1,788	1,662	1,751	1,632	1,677	1,001	1,938	1,907	<b>2,061</b>	2,061	72.4	
Delaware.....	701	711	766	858	736	639	593	622	627	578	665	743	<b>874</b>	874	66.1	
District of Columbia.....	244	237	234	238	238	247	245	263	254	252	241	239	<b>250</b>	250	86.3	
Florida.....	23,350	21,457	21,202	21,700	21,996	22,411	22,426	24,797	24,394	25,614	25,036	25,036	<b>25,036</b>	25,036	82.4	
Georgia.....	16,841	15,100	15,695	14,772	14,903	14,587	15,703	16,562	15,930	18,334	19,985	20,224	<b>22,288</b>	22,288	61.4	
Idaho.....	8,431	6,856	6,611	6,770	7,992	8,048	9,195	10,128	9,334	9,987	9,296	9,124	<b>8,751</b>	8,751	63.4	
Illinois.....	11,287	10,615	10,418	10,391	10,270	10,997	11,509	10,160	12,080	11,884	12,243	12,412	<b>12,412</b>	12,412	81.4	
Indiana.....	7,360	6,839	6,401	6,662	6,883	6,998	7,176	7,392	8,009	8,331	8,502	8,502	<b>8,502</b>	8,502	78.1	
Iowa.....	3,540	2,776	3,010	3,082	3,215	3,364	3,660	3,811	3,807	3,906	3,952	3,988	<b>3,988</b>	3,988	69.6	
Kansas.....	799	696	686	713	754	774	815	837	835	892	894	888	<b>835</b>	835	76.6	
Kentucky.....	9,980	8,680	8,789	9,163	9,083	8,742	8,790	9,436	10,075	11,265	11,800	11,998	<b>11,834</b>	11,834	72.4	
Louisiana.....	44,526	39,810	40,534	41,239	42,485	44,477	43,076	46,400	48,478	46,032	46,000	46,938	<b>46,938</b>	46,938	82.1	
Maine.....	11,492	12,642	11,982	11,235	9,009	10,850	10,584	10,079	10,208	11,114	12,525	13,503	<b>13,264</b>	13,264	73.4	
Maryland.....	4,995	4,789	4,987	4,854	4,878	4,878	4,840	4,840	4,731	4,681	5,230	5,610	<b>5,610</b>	5,610	78.6	
Massachusetts.....	7,059	7,007	6,893	6,949	6,847	6,980	6,627	6,705	6,084	7,100	7,467	7,603	<b>7,787</b>	7,787	83.3	
Michigan.....	21,660	21,910	22,182	21,275	19,951	20,133	20,444	21,203	21,581	22,404	22,233	22,812	<b>24,087</b>	24,087	82.3	
Minnesota.....	15,485	17,553	18,061	17,430	14,051	15,576	15,076	13,492	13,247	14,482	15,825	16,764	<b>16,764</b>	16,764	67.0	
Mississippi.....	37,435	33,981	32,872	33,582	32,797	34,066	34,542	37,025	40,311	42,300	42,720	41,934	<b>42,991</b>	42,991	76.2	
Missouri.....	10,005	8,602	8,418	8,760	8,959	9,306	9,390	10,100	10,515	11,065	11,498	11,687	<b>11,754</b>	11,754	71.6	
Montana.....	3,869	3,610	3,800	3,578	3,879	3,770	4,101	3,823	3,847	3,984	4,196	4,263	<b>4,169</b>	4,169	76.6	
Nebraska.....	526	470	473	463	486	497	523	549	581	550	566	592	<b>559</b>	559	78.1	
New Hampshire.....	7,131	8,237	7,862	7,785	6,371	6,502	6,392	5,143	5,942	6,879	7,008	8,547	<b>7,959</b>	7,959	60.5	
New Jersey.....	4,105	3,833	3,804	3,890	4,023	4,040	3,903	4,081	4,148	4,222	4,333	4,454	<b>4,454</b>	4,454	85.4	
New Mexico.....	1,286	1,149	1,185	1,185	1,035	1,213	1,369	1,425	1,420	1,361	1,393	1,493	<b>1,493</b>	1,493	63.2	
New York.....	16,721	14,878	15,028	15,167	15,341	16,139	16,708	16,636	17,132	17,547	18,232	18,895	<b>18,949</b>	18,949	78.4	
North Carolina.....	25,847	25,743	23,965	26,142	24,249	20,992	20,336	20,492	21,698	27,727	31,022	31,708	<b>35,490</b>	35,490	57.3	
Ohio.....	9,564	8,580	8,521	8,702	8,959	9,192	9,705	9,599	9,898	10,276	10,367	10,367	<b>10,563</b>	10,563	80.5	
Oklahoma.....	2,493	2,277	2,292	2,346	2,381	2,370	2,166	2,409	2,604	2,594	2,747	2,805	<b>2,925</b>	2,925	74.1	
Oregon.....	24,678	17,154	17,887	20,050	23,199	25,898	26,717	28,120	29,834	28,703	28,256	26,858	<b>22,290</b>	22,290	67.5	
Pennsylvania.....	16,295	15,249	15,216	15,022	14,979	15,334	15,719	15,928	16,783	17,234	17,722	18,120	<b>18,234</b>	18,234	82.1	
Rhode Island.....	706	657	690	651	670	697	713	675	706	754	762	792	<b>805</b>	805	73.3	
South Carolina.....	12,732	11,757	11,940	11,096	9,822	9,781	10,007	12,202	13,262	15,242	15,225	15,804	<b>16,626</b>	16,626	58.5	
South Dakota.....	820	759	761	787	685	732	747	752	815	910	938	948	<b>1,009</b>	1,009	67.7	
Tennessee.....	16,814	13,171	13,045	14,488	13,781	14,902	14,884	15,844	17,117	18,707	19,376	20,046	<b>20,407</b>	20,407	63.9	
Texas.....	20,239	17,848	17,885	18,572	18,345	19,499	19,351	20,852	21,659	21,024	22,096	22,136	<b>23,007</b>	23,007	77.6	
Utah.....	866	263	250	297	298	324	331	404	463	486	404	380	<b>432</b>	432	51.4	
Vermont.....	3,948	4,244	4,365	4,209	3,969	4,054	3,878	3,240	3,339	3,566	3,888	4,192	<b>4,432</b>	4,432	73.5	
Virginia.....	20,533	17,418	17,999	19,516	18,944	18,855	18,370	18,024	19,444	22,383	24,099	24,478	<b>25,957</b>	25,957	67.0	
Washington.....	56,018	40,338	44,151	49,350	53,774	56,674	57,586	57,677	62,709	64,756	64,975	62,999	<b>57,687</b>	57,687	62.2	
West Virginia.....	13,665															

# THE LUMBER INDUSTRY.

**TABLE 6.—WAGE EARNERS EMPLOYED IN LOGGING CAMPS, SAWMILLS, AND PLANING MILLS OPERATED IN CONJUNCTION WITH SAWMILLS, BY STATES: 1919.**

STATE.	January.	February.	March.	April.	May.	June.	July.	August.	Septem-ber.	October.	Novem-ber.	Decem-ber.
<b>LOGGING.</b>												
United States.....	180,767	179,859	182,357	168,612	169,774	168,880	175,116	187,565	200,884	211,304	216,279	217,294
Alabama.....	9,396	8,853	9,042	8,883	8,511	8,640	9,136	9,596	10,480	11,288	11,303	11,785
Arizona.....	282	189	215	285	449	455	467	497	442	479	417	385
Arkansas.....	7,022	6,880	6,972	7,185	7,810	7,822	8,706	9,734	10,155	9,372	9,028	9,283
California.....	3,550	3,716	4,291	7,827	9,037	9,132	9,373	8,971	8,832	8,192	7,463	4,851
Colorado.....	412	360	246	276	384	602	613	591	568	525	525	479
Connecticut.....	377	278	370	402	307	309	226	227	343	373	330	385
Delaware.....	130	141	169	137	120	84	96	95	89	114	133	161
Florida.....	7,020	6,833	7,143	7,309	7,381	7,250	7,938	8,411	8,107	8,558	8,223	8,094
Georgia.....	4,739	4,128	4,617	4,681	4,294	4,793	5,217	4,949	5,981	6,395	6,377	6,860
Idaho.....	3,440	3,419	3,255	3,593	4,063	4,330	4,260	4,272	4,657	4,173	4,382	4,686
Illinois.....	138	148	92	127	135	171	217	217	234	278	224	271
Indiana.....	502	586	612	582	529	537	426	453	522	565	585	605
Iowa.....	72	84	83	57	33	16	16	18	49	54	62	46
Kentucky.....	2,509	2,508	2,776	2,592	2,397	2,404	2,702	2,874	3,237	3,260	3,179	3,178
Louisiana.....	12,969	13,190	13,634	14,052	15,055	14,370	15,453	16,188	15,792	15,903	15,661	15,367
Maine.....	6,500	6,135	4,889	2,694	2,333	1,789	1,733	2,044	2,932	4,269	5,318	6,154
Maryland.....	649	621	696	690	663	587	528	522	573	770	917	986
Massachusetts.....	651	648	648	530	460	420	371	394	411	488	542	553
Michigan.....	8,976	8,829	7,680	4,852	4,562	4,481	4,873	5,126	5,608	6,127	6,973	8,447
Minnesota.....	11,986	12,029	11,141	5,884	2,928	2,974	2,950	2,824	4,365	6,679	9,294	11,001
Mississippi.....	12,100	11,495	11,861	11,703	12,236	12,294	13,423	14,824	15,302	14,813	15,102	14,901
Missouri.....	1,160	1,216	1,191	1,248	1,276	1,406	1,545	1,796	1,932	1,928	2,020	2,028
Montana.....	2,675	2,633	2,214	1,736	1,897	2,074	1,792	1,771	1,975	1,975	2,242	2,395
Nebraska.....	2	2	2	2	2	2	2	2	2	2	2	2
New Hampshire.....	2,900	3,178	2,920	1,496	1,512	1,358	500	1,438	1,973	2,592	3,156	2,640
New Jersey.....	333	352	384	354	340	335	311	302	318	366	374	400
New Mexico.....	410	418	414	352	454	488	501	475	465	474	540	527
New York.....	2,585	2,538	2,210	1,631	1,645	1,714	1,553	1,815	2,120	2,555	2,800	2,758
North Carolina.....	9,890	8,942	9,856	9,003	7,593	6,930	7,257	7,836	10,302	11,572	11,359	12,182
Ohio.....	717	734	733	651	637	636	466	485	521	574	604	600
Oklahoma.....	763	755	743	782	765	736	702	731	747	804	843	857
Oregon.....	5,683	5,607	6,891	8,822	10,217	10,445	10,713	11,253	10,946	10,766	10,018	7,230
Pennsylvania.....	3,943	3,933	3,829	3,579	3,613	3,503	3,344	3,579	3,788	3,922	4,205	4,312
Rhode Island.....	11	11	43	43	43	43	15	15	26	22	22	36
South Carolina.....	4,868	4,785	4,365	3,621	3,618	3,687	4,567	5,223	6,322	6,152	6,460	6,927
South Dakota.....	331	321	332	200	236	242	276	237	200	369	393	393
Tennessee.....	3,054	2,997	3,601	3,335	3,616	3,603	3,818	4,117	4,568	4,590	4,662	4,720
Texas.....	5,940	6,073	6,242	6,230	6,424	6,349	7,137	7,587	7,299	7,540	7,450	7,507
Utah.....	92	84	100	93	109	79	136	124	128	107	88	117
Vermont.....	1,524	1,512	1,255	563	471	501	427	509	693	866	1,198	1,374
Virginia.....	5,858	5,092	6,738	6,224	6,135	5,716	6,097	6,538	7,406	8,452	8,136	8,829
Washington.....	14,712	17,449	19,745	22,124	22,988	23,165	22,829	25,692	26,460	26,750	25,655	21,883
West Virginia.....	5,970	6,035	6,659	6,644	6,657	6,856	7,138	7,138	7,029	6,932	6,815	6,928
Wisconsin.....	13,414	13,184	11,188	6,005	5,568	5,388	5,231	5,705	6,573	8,826	10,894	13,752
Wyoming.....	262	278	301	283	284	294	304	296	287	280	270	288
<b>MILLS.</b>												
United States.....	247,035	248,947	262,511	272,353	281,110	285,955	294,861	307,160	322,566	331,771	327,019	331,361
Alabama.....	14,140	13,900	14,467	14,687	13,950	14,314	14,882	15,734	17,806	18,730	19,093	20,654
Arizona.....	461	419	363	489	667	681	719	708	680	671	677	617
Arkansas.....	19,459	19,122	18,826	19,058	19,727	20,126	22,198	24,593	26,134	25,872	24,901	25,153
California.....	7,473	7,325	7,877	9,001	10,155	10,617	11,584	11,247	11,096	11,339	11,087	9,787
Colorado.....	187	204	193	233	312	427	485	457	472	478	414	362
Connecticut.....	335	279	389	425	360	384	269	275	396	412	404	473
Delaware.....	293	338	390	294	254	233	235	249	239	296	338	412
Florida.....	12,174	12,039	12,358	12,436	12,802	12,950	14,138	14,201	13,917	14,635	14,318	14,461
Georgia.....	7,124	6,806	7,070	6,852	6,731	7,440	7,882	7,559	8,787	9,903	10,105	11,685
Idaho.....	2,788	3,088										

TABLE 7.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, BY STATES:  
1919 AND 1914.

STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—								
			44 and under.	Between 44 and 48.	48.1	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.	
UNITED STATES.											
All branches.....	1919	610,346	23,451	3,571	122,891	39,326	40,478	64,325	294,878	12,426	
	1914	614,548	( <sup>2</sup> )	( <sup>2</sup> )	27,881	25,427	52,268	56,664	397,272	55,633	
	1909	695,010	( <sup>2</sup> )	( <sup>2</sup> )	23,315	17,418	41,713	49,986	469,292	83,297	
LUMBER AND TIMBER PRODUCTS.....	1919	480,945	11,002	2,547	101,476	18,176	20,896	36,305	272,774	11,769	
	1914	479,786	( <sup>2</sup> )	( <sup>2</sup> )	12,850	10,023	21,015	24,638	355,548	54,212	
LUMBER, PLANING-MILL PRODUCTS.....	1919	86,956	10,551	510	16,723	12,025	17,407	15,908	12,710	513	
	1914	96,214	( <sup>2</sup> )	( <sup>2</sup> )	14,173	11,349	25,402	16,605	28,213	472	
BOXES, WOODEN PACKING.....	1919	42,445	1,898	505	4,092	8,525	5,175	12,112	9,394	144	
	1914	38,548 <sup>a</sup>	( <sup>2</sup> )	( <sup>2</sup> )	8,558	3,155	5,251	15,421	13,511	352	
STATES.											
Alabama.....	1919	27,697	1,777	394	449	1,909	707	3,224	15,050	3,587	
	1914	22,750	( <sup>2</sup> )	( <sup>2</sup> )	1,084	623	430	1,499	10,325	8,789	
Arizona.....	1919	1,630	27	.....	46	.....	35	.....	931	.....	
	1914	1,232	( <sup>2</sup> )	( <sup>2</sup> )	27	16	12	.....	1,177	.....	
Arkansas.....	1919	31,884	744	106	837	711	715	1,934	26,837	.....	
	1914	20,560	( <sup>2</sup> )	( <sup>2</sup> )	603	838	913	620	26,385	201	
California.....	1919	24,820	1,793	64	14,552	186	1,896	737	5,571	.....	
	1914	22,352	( <sup>2</sup> )	( <sup>2</sup> )	3,061	537	2,814	316	15,402	192	
Colorado.....	1919	1,294	324	45	111	18	221	3	538	34	
	1914	1,327	( <sup>2</sup> )	( <sup>2</sup> )	218	19	225	80	807	28	
Connecticut.....	1919	1,773	388	20	247	533	316	54	209	.....	
	1914	2,388	( <sup>2</sup> )	( <sup>2</sup> )	438	411	1,120	86	274	.....	
Delaware.....	1919	701	7	3	14	42	262	149	224	.....	
	1914	780	( <sup>2</sup> )	( <sup>2</sup> )	17	69	64	413	223	.....	
District of Columbia.....	1919	244	7	6	231	.....	.....	.....	.....	.....	
	1914	249	( <sup>2</sup> )	( <sup>2</sup> )	240	.....	.....	.....	.....	.....	
Florida.....	1919	23,350	930	119	341	995	736	1,630	16,715	1,875	
	1914	18,358	( <sup>2</sup> )	( <sup>2</sup> )	708	180	888	408	10,384	5,790	
Georgia.....	1919	16,841	536	92	377	1,424	554	4,955	8,261	642	
	1914	18,196	( <sup>2</sup> )	( <sup>2</sup> )	1,203	1,731	501	1,731	8,693	4,244	
Idaho.....	1919	8,431	1	3	8,158	31	42	33	161	2	
	1914	6,032	( <sup>2</sup> )	( <sup>2</sup> )	35	5	70	10	5,793	110	
Illinois.....	1919	11,287	3,310	305	594	1,814	1,183	2,934	1,137	4	
	1914	14,734	( <sup>2</sup> )	( <sup>2</sup> )	1,028	2,061	3,002	4,337	2,585	21	
Indiana.....	1919	7,360	174	46	205	758	685	2,609	2,883	.....	
	1914	7,618	( <sup>2</sup> )	( <sup>2</sup> )	369	568	1,294	1,375	4,022	.....	
Iowa.....	1919	3,549	6	1	126	129	2,393	217	707	.....	
	1914	3,302	( <sup>2</sup> )	( <sup>2</sup> )	200	15	651	352	2,084	.....	
Kansas.....	<sup>a</sup> 1919	799	.....	.....	403	10	294	19	73	.....	
	1914	763	( <sup>2</sup> )	( <sup>2</sup> )	18	9	272	.....	459	5	
Kentucky.....	1919	9,980	491	154	219	607	883	1,749	5,873	4	
	1914	13,127	( <sup>2</sup> )	( <sup>2</sup> )	837	1,002	3,335	1,016	6,750	97	
Louisiana.....	1919	44,526	430	86	403	753	1,360	1,171	39,778	536	
	1914	44,413	( <sup>2</sup> )	( <sup>2</sup> )	153	352	1,104	503	28,414	13,837	
Maine.....	1919	11,492	216	20	326	433	5,957	1,652	2,264	624	
	1914	14,906	( <sup>2</sup> )	( <sup>2</sup> )	129	166	1,870	1,970	8,332	2,439	
Maryland.....	1919	4,995	203	225	216	594	1,238	1,762	757	.....	
	1914	6,016	( <sup>2</sup> )	( <sup>2</sup> )	174	297	909	1,730	2,896	10	
Massachusetts.....	1919	7,059	609	81	1,808	2,971	894	606	90	.....	
	1914	8,043	( <sup>2</sup> )	( <sup>2</sup> )	1,051	2,014	2,278	2,006	694	.....	
Michigan.....	1919	21,660	308	6	196	2,010	1,240	2,830	15,061	.....	
	1914	28,058	( <sup>2</sup> )	( <sup>2</sup> )	257	922	2,165	2,396	22,289	29	
Minnesota.....	1919	15,485	15	129	341	407	2,449	1,268	8,126	2,750	
	1914	20,710	( <sup>2</sup> )	( <sup>2</sup> )	25	425	1,608	706	17,545	350	

<sup>1</sup> Includes 48 and under for 1914 and 1909.<sup>2</sup> Figures not available.<sup>a</sup> Excludes statistics for 2 establishments to avoid disclosure of individual operations.

# THE LUMBER INDUSTRY.

TABLE 7.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, BY STATES: 1919 AND 1914—Continued.

STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							
			44 and under.	Between 44 and 48.	48. <sup>1</sup>	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
			STATES—continued.							
Mississippi.....	1919 1914	37,495 29,640	2,432 ( <sup>2</sup> )	164 ( <sup>2</sup> )	453 475	2,403 837	1,174 899	1,671 1,113	28,640 25,895	498 421
Missouri.....	1919 1914	10,005 9,097	485 ( <sup>2</sup> )	124 ( <sup>2</sup> )	951 587	1,628 1,086	1,438 1,195	1,807 635	3,572 5,493	161
Montana.....	1919 1914	3,869 2,965	45 ( <sup>2</sup> )	17 ( <sup>2</sup> )	1,814 69	6	692 972	38 36	1,192 1,822	65 66
Nebraska.....	1919 1914	526 493	5 ( <sup>2</sup> )		17 52	132 15	215 129	144 269	13	
New Hampshire.....	1919 1914	7,131 7,264	10 ( <sup>2</sup> )	22 ( <sup>2</sup> )	1,574 95	2,307 215	1,868 1,250	762 2,753	574 2,897	5 44
New Jersey.....	1919 1914	4,105 4,872	822 ( <sup>2</sup> )	67 ( <sup>2</sup> )	880 633	1,653 709	455 1,426	183 1,551	39 553	6
New Mexico.....	1919 1914	1,286 642	387 ( <sup>2</sup> )		20 116		54 80	178 2	647 444	
New York.....	1919 1914	16,721 21,037	2,506 ( <sup>2</sup> )	42 ( <sup>2</sup> )	2,020 4,089	3,272 1,427	2,966 3,577	2,023 4,385	3,866 7,012	56 537
North Carolina.....	1919 1914	25,847 34,374	372 ( <sup>2</sup> )	168 ( <sup>2</sup> )	149 635	2,543 1,675	426 223	7,216 3,245	14,327 28,410	648 5,186
Ohio.....	1919 1914	9,504 11,711	233 ( <sup>2</sup> )	87 ( <sup>2</sup> )	535 826	1,354 799	2,019 3,038	3,456 3,321	1,819 3,700	1 17
Oklahoma.....	1919 1914	2,493 2,651	107 ( <sup>2</sup> )	9 ( <sup>2</sup> )	93 126	78	433 388		1,773 1,494	416
Oregon.....	1919 1914	24,578 13,888	75 ( <sup>2</sup> )	184 ( <sup>2</sup> )	23,469 167	123 42	390 1,113	6 313	361 12,233	
Pennsylvania.....	1919 1914	16,295 21,153	663 ( <sup>2</sup> )	227 ( <sup>2</sup> )	2,839 1,255	2,233 1,374	3,216 4,431	2,235 4,993	4,817 8,561	539
Rhode Island.....	1919 1914	706 772	69 ( <sup>2</sup> )		43 198	383 58	30 270	171 149	10 97	
South Carolina.....	1919 1914	12,782 11,308	186 ( <sup>2</sup> )	75 ( <sup>2</sup> )	249 309	943 359	544 136	1,835 361	8,815 8,405	85 1,738
South Dakota.....	1919 1914	820 281	5 ( <sup>2</sup> )		21 11	13	138 88		643 180	
Tennessee.....	1919 1914	16,314 18,084	618 ( <sup>2</sup> )	119 ( <sup>2</sup> )	305 921	1,658 529	761 1,306	3,262 1,958	9,115 11,746	386 1,624
Texas.....	1919 1914	20,239 19,906	369 ( <sup>2</sup> )	51 ( <sup>2</sup> )	651 370	437 398	1,226 939	1,314 339	16,132 16,622	59 1,238
Utah.....	1919 1914	366 748	120 ( <sup>2</sup> )		128 573	2 70	27 44	3	10 53	76 8
Vermont.....	1919 1914	3,948 4,098	21 ( <sup>2</sup> )	3 ( <sup>2</sup> )	36 32	163 16	2,253 884	409 1,137	1,063 2,029	
Virginia.....	1919 1914	20,533 26,305	637 ( <sup>2</sup> )	117 ( <sup>2</sup> )	583 1,215	1,163 2,203	1,332 660	4,989 4,680	11,437 14,137	275 3,410
Washington.....	1919 1914	56,018 38,072	475 ( <sup>2</sup> )	93 ( <sup>2</sup> )	54,866 385		361 1,405	20 345	203 35,828	71
West Virginia.....	1919 1914	13,665 17,417	234 ( <sup>2</sup> )	70 ( <sup>2</sup> )	191 308	361 190	1,657 397	482 219	10,670 13,233	3,070
Wisconsin.....	1919 1914	28,822 32,282	234 ( <sup>2</sup> )	10 ( <sup>2</sup> )	516 1,807	69 420	1,728 1,755	2,468 2,622	23,605 28,320	194 358
Wyoming.....	1919 1914	361 364	10 ( <sup>2</sup> )	1 ( <sup>2</sup> )	155 9		28 11	82 1	69 343	16

<sup>1</sup> Includes 48 and under for 1914 and 1909.  
<sup>2</sup> Figures not available.  
<sup>3</sup> Excludes statistics for 1 establishment to avoid disclosure of individual operations.  
<sup>4</sup> Excludes statistics for 2 establishments to avoid disclosure of individual operations.

TABLE 8.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, BY STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—																	
	Establishments.	Wage earners (average number).	No wage earners.		1 to 5 wage earners, inclusive.		6 to 20 wage earners, inclusive.		21 to 50 wage earners, inclusive.		51 to 100 wage earners, inclusive.		101 to 250 wage earners, inclusive.		251 to 500 wage earners, inclusive.		501 to 1,000 wage earners, inclusive.		Over 1,000 wage earners.	
			Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
UNITED STATES.																				
All branches:																				
1919.....	32,568	610,346	1,254	19,377	40,816	7,107	78,273	2,475	80,002	1,022	73,825	895	141,800	330	112,028	93	62,856	15	20,566	
1914.....	34,244	614,548	1,100	19,563	46,038	8,010	83,545	2,533	80,838	1,083	77,587	873	130,569	293	101,025	83	55,037	16	23,909	
LUMBER AND TIMBER PRODUCTS:																				
1919.....	26,119	480,945	843	16,640	34,267	5,333	57,213	1,547	49,900	662	48,068	698	112,573	266	100,413	85	57,936	15	20,566	
1914.....	27,220	479,786	809	16,561	38,535	6,514	69,188	1,547	49,130	676	49,113	675	107,400	261	91,762	76	50,740	16	23,909	
LUMBER, PLANING-MILL PRODUCTS:																				
1919.....	5,309	86,956	357	2,405	5,795	1,510	17,824	687	21,889	217	15,280	108	16,068	21	7,432	4	2,608			
1914.....	5,841	96,214	249	2,583	6,573	1,814	20,884	777	24,716	279	19,254	119	17,576	17	5,393	3	1,818			
BOXES, WOODEN PACKING:																				
1919.....	1,140	42,445	54	332	754	264	3,236	241	8,294	143	10,477	89	13,240	13	4,183	4	2,252			
1914.....	1,174	38,548	42	419	930	282	3,473	209	6,992	128	9,220	79	11,584	11	3,870	4	2,479			
STATES.																				
Alabama.....	1,774	27,097	53	1,034	2,104	476	5,500	118	3,741	49	3,428	32	5,149	6	2,263	4	2,372	2	2,480	
Arizona.....	28	1,030	18	46	18	3	68	3	68	1	53	2	298	2	574					
Arkansas.....	1,562	31,884	39	878	1,832	382	4,108	150	4,848	51	3,726	37	5,692	18	6,272	6	4,357	1	1,049	
California.....	506	24,820	21	255	638	143	1,624	66	2,215	31	2,388	20	4,314	14	4,933	7	4,893	3	3,874	
Colorado.....	181	1,294	12	119	260	35	367	11	334	4	343									
Connecticut.....	292	1,773	17	194	424	65	711	14	458	1	59	1	121							
Delaware.....	90	701	1	64	110	10	173	0	166	2	122	1	130							
District of Columbia.....	9	244				3	20	6	224											
Florida.....	552	23,350	9	194	507	169	2,106	80	3,011	29	2,120	41	6,262	15	5,466	6	3,872			
Georgia.....	1,656	10,841	47	1,132	2,157	329	3,427	82	2,627	37	2,893	21	3,228	8	2,500					
Idaho.....	213	8,431	18	123	213	27	257	17	515	7	400	9	1,492	9	3,280	3	2,208			
Illinois.....	495	11,287	31	230	445	118	1,324	59	1,894	34	2,304	16	2,210	4	1,351	3	1,723			
Indiana.....	736	7,300	19	448	902	180	2,040	64	1,987	15	908	10	1,433							
Iowa.....	144	3,549	9	81	151	26	305	14	496	8	606	2	279	3	1,031	1	681			
Kansas <sup>1</sup> .....	59	790	6	30	60	16	166	5	165	1	75			1	333					
Kentucky.....	1,045	9,980	22	818	1,757	121	1,259	42	1,393	24	1,057	15	2,308	1	260	2	1,346			
Louisiana.....	579	44,520	4	173	398	136	1,664	90	3,008	45	3,094	75	12,595	44	14,946	11	7,610	1	1,211	
Maine.....	712	11,492	18	387	848	190	2,190	69	2,245	20	1,817	19	3,299	3	1,084					
Maryland.....	497	4,995	17	314	574	111	1,178	35	1,189	11	788	9	1,260							
Massachusetts.....	465	7,059	18	238	505	127	1,440	54	1,778	22	1,608	10	1,390	1	332					
Michigan.....	618	21,660	17	267	616	149	1,775	80	2,787	47	3,554	39	5,840	15	4,523	4	2,565			
Minnesota.....	366	15,485	16	184	336	74	872	39	1,300	22	1,599	21	2,999	5	1,501	4	3,136	1	3,745	
Mississippi.....	1,504	37,435	15	842	1,818	392	4,425	120	4,011	55	4,115	47	7,049	20	7,036	13	8,381			
Missouri.....	697	10,005	33	459	813	116	1,308	51	1,728	18	1,304	12	2,005	8	2,847					
Montana <sup>1</sup> .....	183	3,899	6	124	243	24	286	17	607	3	191	4	550	4	1,366	1	620			
Nebraska.....	39	526	1	24	62	5	62	6	170	3	226									
New Hampshire.....	393	7,131	13	193	464	120	1,371	40	1,307	17	1,208	8	1,381	1	327					
New Jersey.....	368	4,105	24	209	475	98	1,034	25	745	8	578	2	440	1	281					
New Mexico.....	56	1,286		37	73	9	109	5	180	1	75	3	543	1	306					
New York.....	1,526	10,721	134	909	1,772	276	3,117	139	4,396	45	3,141	19	2,887	4	1,408					
North Carolina.....	2,057	25,847	44	2,085	5,003	657	6,612	100	3,299	27	1,993	34	5,511	9	2,744	1	715			
Ohio.....	990	9,504	45	620	1,309	216	2,487	72	2,296	24	1,501	12	1,567	1	359					
Oklahoma <sup>1</sup> .....	201	2,493	6	153	290	29	320	7	232	4	284			1	291					
Oregon.....	706	24,578	46	336	817	152	1,728	65	2,335	39	2,816	43	6,743	10	6,204	0	4,935			
Pennsylvania.....	1,935	16,295	118	1,278	2,747	394	4,105	95	2,855	33	2,337	12	1,754	3	1,020	2	1,411			
Rhode Island.....	63	706	4	31	75	18	209	7	222	3	200									
South Carolina.....	670	12,732	6	405	742	164	1,704	40	1,257	28	2,063	20	3,325	6	2,242					
South Dakota.....	73	820	8	47	80	11	140	2	50	3	173	2	308							
Tennessee.....	1,570	16,314	88	1,069	2,052	261	2,772	85	2,746	35	2,047	25	3,245	6	2,246	1	600			
Texas.....	606	20,239	21	298	780	142	1,518	62	1,954	27	1,980	33	5,608	20	6,660	3	1,733			
Utah <sup>1</sup> .....	118	366	15	87	141	6	68	4	114	1	53									
Vermont.....	457	3,948	19	288	650	112	1,172	25	770	6	420	6	930							
Virginia.....	2,110	20,533	84	1,453	3,027	419	4,033	91	2,776	22	1,620	32	5,093	8	2,813					
Washington.....	1,232	56,018	30	460	1,013	305	3,746	196	6,425	86	6,203	123	20,793	28	9,293	9	6,186	2	2,269	
West Virginia.....	773	13,665	57	484	952	136	1,525	40	1,185	20	1,598	24	3,588	10	3,376	2	1,471			
Wisconsin.....	605	28,822	29	249	450	138	1,604	64	1,997	43	3,095	47	7,470	31	10,545	3	2,383	1	1,278	
Wyoming.....	83	361	13	62	90		32		84	2	135									

<sup>1</sup> Excludes statistics for 2 establishments to avoid disclosure of individual operations.  
<sup>2</sup> Excludes statistics for 1 establishment to avoid disclosure of individual operations.



TABLE 10.—CHARACTER OF OWNERSHIP, BY STATES: 1919 AND 1914—Continued.

STATE.	Cen- sus year.	NUMBER OF ESTABLISHMENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.									VALUE OF PRODUCTS.								
		Indi- vid- uals.	Cor- pora- tions.	All others	Total.	In establishments owned by—			Per cent of total.			Total.	Of establishments owned by—			Per cent of total.						
						Indi- vid- uals.	Cor- pora- tions.	All others.	Indi- vid- uals.	Cor- pora- tions.	All others.		Indi- vid- uals.	Cor- pora- tions.	All others.	Indi- vid- uals.	Cor- pora- tions.	All others.				
STATES—continued.																						
Florida.....	1919	253	155	144	23,350	2,003	17,706	2,951	11.1	76.2	12.6	\$50,409,154	\$5,485,057	\$38,142,803	\$0,781,234	10.0	75.7	13.5				
	1914	248	136	123	18,358	2,507	13,384	2,377	14.1	72.9	12.0	21,456,808	2,828,165	16,021,578	2,607,155	13.2	74.7	12.2				
Georgia.....	1919	1,093	163	400	16,841	4,279	9,110	3,452	25.4	54.1	20.5	43,051,050	9,833,570	24,084,555	9,132,925	22.8	55.9	21.2				
	1914	1,014	140	434	18,196	5,172	9,475	3,549	28.4	52.1	19.5	22,114,995	5,256,806	12,404,102	4,304,027	23.8	56.4	19.9				
Idaho.....	1919	104	56	53	8,431	468	7,559	404	5.6	89.7	4.8	30,784,851	1,327,620	28,176,205	1,280,960	4.3	91.5	4.2				
	1914	75	42	41	6,032	245	5,004	783	4.1	83.0	13.0	13,352,572	460,814	11,031,402	1,800,356	3.4	82.6	13.9				
Illinois.....	1919	204	202	80	11,287	908	9,787	532	8.6	86.7	4.7	59,775,411	4,737,668	52,148,837	2,888,936	7.9	87.2	4.8				
	1914	263	226	105	14,734	1,406	12,500	828	9.5	84.8	5.6	41,503,020	3,734,364	35,901,516	1,867,310	9.0	86.5	4.5				
Indiana.....	1919	334	220	182	7,360	1,349	4,698	1,313	18.3	63.8	17.8	35,042,583	5,075,958	24,746,098	5,219,927	14.5	70.6	14.9				
	1914	467	205	281	7,618	2,029	3,844	1,745	26.0	50.5	22.9	20,995,187	4,202,817	13,107,400	3,594,970	20.4	62.4	17.1				
Iowa.....	1919	60	57	27	3,549	179	3,195	175	5.0	90.0	4.9	17,893,148	517,049	16,699,061	677,038	2.9	93.3	3.8				
	1914	59	55	27	3,302	162	2,913	227	4.9	88.2	6.9	11,426,588	375,000	10,411,591	639,937	3.3	91.1	5.6				
Kansas.....	1919	38	9	12	799	142	564	93	17.8	70.6	11.6	3,932,677	740,403	2,680,604	505,610	18.8	68.3	12.9				
	1914	38	11	13	763	116	491	156	15.2	64.4	20.4	2,433,028	355,300	1,666,486	411,242	14.6	68.5	16.9				
Kentucky.....	1919	613	155	277	9,980	1,878	6,694	1,408	18.8	67.1	14.1	33,836,475	5,729,091	24,191,403	3,915,981	16.9	71.5	11.6				
	1914	826	130	330	13,127	3,642	7,304	2,091	27.7	56.3	15.9	20,073,643	3,711,045	13,771,892	2,570,106	18.6	68.6	12.8				
Louisiana.....	1919	186	287	106	44,526	1,752	40,442	2,332	3.0	90.8	5.2	130,459,772	4,421,219	120,139,862	5,898,691	3.4	92.1	4.5				
	1914	162	292	89	44,413	1,699	40,621	2,093	3.8	91.5	4.7	60,646,338	1,982,510	61,891,664	3,772,164	3.0	92.9	4.2				
Maine.....	1919	409	134	169	11,492	2,489	7,452	1,551	21.7	64.8	13.5	36,388,864	7,118,987	24,546,590	4,723,287	19.6	67.5	13.0				
	1914	581	130	235	14,906	4,324	7,764	2,818	29.0	52.1	18.9	26,282,290	6,366,185	16,241,298	3,674,807	24.2	61.8	14.0				
Maryland.....	1919	209	81	117	4,995	1,123	2,957	915	22.5	59.2	18.3	18,636,487	3,174,914	12,188,423	3,273,150	17.0	65.4	17.6				
	1914	300	68	113	6,016	1,490	3,099	1,427	24.8	51.5	23.7	11,723,163	2,083,786	7,188,343	2,451,504	17.8	61.3	20.9				
Massachusetts.....	1919	263	128	74	7,059	1,649	4,307	1,013	23.4	62.3	14.4	33,408,778	6,102,954	21,822,681	5,483,143	18.3	65.3	16.4				
	1914	340	118	108	8,043	2,361	4,290	1,392	29.4	53.3	17.3	22,740,456	5,392,392	13,045,748	4,302,315	23.7	57.4	18.9				
Michigan.....	1919	246	228	144	21,660	2,417	15,409	3,834	11.2	71.6	17.7	88,890,645	10,615,701	66,051,355	12,223,589	11.9	74.3	13.8				
	1914	315	256	163	28,058	3,217	21,500	3,341	11.5	70.6	11.9	57,222,073	6,307,934	44,179,804	6,734,335	11.0	77.2	11.8				
Minnesota.....	1919	174	112	80	15,485	1,135	13,310	1,040	7.3	86.0	6.7	52,579,620	3,018,561	45,252,428	4,308,631	5.7	86.1	8.2				
	1914	213	133	97	20,719	1,366	17,945	1,408	6.6	86.6	6.8	43,664,686	2,680,392	39,120,076	1,855,218	6.1	89.6	4.2				
Mississippi.....	1919	809	201	494	37,435	6,580	25,114	5,741	17.6	67.1	15.8	94,500,553	10,977,890	62,966,305	14,556,358	18.0	66.6	15.4				
	1914	738	179	379	29,640	5,475	20,650	3,515	18.5	69.7	11.9	38,537,743	6,016,804	27,871,491	4,649,448	15.6	62.3	12.1				
Missouri.....	1919	352	143	202	10,005	1,010	7,680	1,315	10.1	76.8	13.1	33,655,305	2,834,250	27,340,446	3,471,003	8.4	81.3	10.3				
	1914	503	153	227	9,097	1,663	6,359	1,075	18.3	69.9	11.8	18,165,706	2,604,560	13,736,287	1,824,859	14.3	75.6	10.0				
Montana.....	1919	102	30	51	3,869	690	2,903	276	17.8	75.0	7.1	12,196,981	1,660,006	9,805,010	781,905	13.6	80.4	6.4				
	1914	90	38	36	2,965	394	2,346	315	13.3	70.1	7.6	6,720,881	620,701	5,837,222	362,958	7.7	86.9	5.0				
Nebraska.....	1919	22	15	2	526	123	403	22	23.4	76.0	.....	2,740,074	641,307	2,107,767	.....	23.3	76.7	.....				
	1914	25	18	4	493	108	363	22	21.9	73.6	4.5	1,502,824	287,717	1,173,017	42,090	19.1	78.1	2.8				
New Hampshire.....	1919	223	71	99	7,131	1,548	4,195	1,388	21.7	58.8	19.5	24,209,530	4,043,655	15,055,538	4,510,337	19.2	62.2	18.6				
	1914	346	71	96	7,264	2,481	3,545	1,238	34.2	48.8	17.0	16,519,056	4,907,703	8,937,785	2,583,508	30.8	54.1	15.6				
New Jersey.....	1919	192	106	70	4,105	708	3,003	394	17.2	73.2	9.6	22,002,444	2,740,988	17,297,042	1,963,814	12.5	78.6	8.9				
	1914	216	107	55	4,872	1,276	3,157	439	26.2	64.8	9.0	12,432,584	2,542,212	8,890,014	994,358	20.4	71.6	8.0				
New Mexico.....	1919	31	18	7	1,286	103	1,156	27	8.0	89.9	2.1	2,971,101	157,511	2,751,924	61,066	5.3	92.6	2.1				
	1914	32	16	12	1,042	172	409	61	26.8	63.7	9.5	1,043,201	153,657	1,184,480	305,154	9.3	72.1	18.6				
New York.....	1919	828	360	338	16,721	2,727	11,864	2,130	16.3	71.0	12.7	82,508,191	11,863,736	61,353,152	9,291,303	14.4	74.4	11.3				
	1914	1,010	371	382	21,037	4,259	13,322	3,450	20.2	63.3	10.4	58,794,013	10,117,713	38,938,213	9,688,037	17.2	66.3	16.5				
North Carolina.....	1919	1,027	278	752	25,847	8,114	13,577	4,156	31.4	52.5	16.1	99,554,024	21,170,739	30,536,050	11,846,635	30.4	52.5	17.0				
	1914	1,782	277	893	34,374	9,075	19,049	5,650	28.1	55.4	16.4	39,631,573	9,092,984	23,361,089	6,577,595	24.5	58.9	16.6				
Ohio.....	1919	447	281	262	9,504	2,021	5,839	1,644	21.3	61.4	17.3	53,396,914	9,266,887	36,758,485	7,371,542	17.4	68.8	13.8				
	1914	604	278	287	11,711	3,154	6,410	2,147	26.9	54.7	18.3	31,291,810	6,417,796	19,151,415	5,722,599	20.5	61.2	13.3				
Oklahoma.....	1919	129	35	37	2,493	279	2,098	116	11.2	84.2	4.7	8,053,721	952,908	6,025,121	475,692	11.8	82.3	5.9				
	1914	211	32	41	2,651	1,034	1,295	322	39.0	48.8	12.1	4,113,522	968,830	2,398,090	677,002	23.6	58.3	18.1				
Oregon.....	1919	256	241	209	24,578	1,387	21,729	1,462	5.6	88.4	5.9	95,264,297	4,677,009	85,426,027	5,161,201	4.9	89.7	5.4				
	1914	197	162	165	13,888	744	12,306	838	5.4	88.6	6.0	30,915,526	1,226,045	28,000,632	1,679,849	4.0	90.6	5.4				
Pennsylvania.....	1919	1,171	258	506	16,295	4,932	7,858	3,505	30.3	48.2	21.5	67,712,658	17,522,753	37,113,622	13,076,283	25.9	54.8	19.3				
	1914	1,465	242	626	21,163	7,036	8,229	5,288	32.6	38.9	25.0	49,498,584	14,711,833	22,888,906	12,397,795	29.7	45.2	25.0				
Rhode Island.....	1919	37	16	10	706	230	333	93	32.6	54.2	13.2	2,976,609	873,299	1,721,122	382,248	29.3	57.8	12.3				
	1914	32	11	9	772	287	411	74	37.2	53.2	9.6											



TABLE 12.—FUEL CONSUMED, BY STATES: 1919, AND 1914.

STATE.	Cen- sus year.	COAL.			Fuel oils (bar- rels).	Gasoline and other vola- tile oils (bar- rels).	Gas (1,000 cubic feet).	STATE.	Cen- sus year.	COAL.			Fuel oils (bar- rels).	Gasoline and other vola- tile oils (bar- rels).	Gas (1,000 cubic feet).
		An- thra- cite (tons 2,240 lbs.).	Bi- tum- inous (tons 2,000 lbs.).	Coke (tons 2,000 lbs.).						An- thra- cite (tons 2,240 lbs.).	Bi- tum- inous (tons 2,000 lbs.).	Coke (tons 2,000 lbs.).			
UNITED STATES.							STATES—continued.								
All branches.....	1919	59,524	2,259,780	20,629	853,076	72,079	406,462	1919	1,543	14,727	.....	37	8,455	14	
	1914	76,700	1,407,017	4,989	507,138	( <sup>1</sup> )	480,096	1914	361	19,556	.....	716	( <sup>1</sup> )	.....	
LUMBER AND TIMBER PROD- UCTS.	1919	19,536	1,015,908	6,221	805,081	52,546	20,347	1919	760	67,171	1,032	268	1,697	2	
	1914	24,586	885,537	1,906	454,092	( <sup>1</sup> )	91,975	1914	57,513	37,513	.....	685	( <sup>1</sup> )	.....	
LUMBER, PLANING-MILL PROD- UCTS.	1919	35,730	580,970	23,204	44,669	18,572	363,963	1919	84	31,522	60	2,200	887	2,687	
	1914	44,552	457,943	2,971	48,630	( <sup>1</sup> )	350,275	1914	14	34,568	1,061	3,581	( <sup>1</sup> )	4,380	
BOXES, WOODEN PACKING....	1919	4,258	56,800	114	3,326	961	22,152	1919	.....	7,069	.....	90	95	.....	
	1914	7,562	63,537	52	4,507	( <sup>1</sup> )	37,846	1914	.....	3,362	.....	90	( <sup>1</sup> )	.....	
STATES.															
Alabama.....	1919	86	33,755	1,853	60	889	.....	1919	9	2,155	105	.....	242	.....	
	1914	.....	27,627	.....	1,397	( <sup>1</sup> )	408	1914	30	2,601	.....	194	( <sup>1</sup> )	362	
Arizona.....	1919	.....	.....	.....	19,748	.....	.....	1919	.....	.....	.....	.....	.....	.....	
	1914	.....	1,650	.....	22,341	( <sup>1</sup> )	30	1914	.....	.....	.....	.....	.....	.....	
Arkansas.....	1919	6,818	76,045	2,500	400	1,897	11,031	1919	.....	.....	.....	.....	.....	.....	
	1914	4,427	75,742	1,704	690	( <sup>1</sup> )	15,898	1914	.....	6,911	.....	17	34	.....	
California.....	1919	14	38	20,348	157,407	3,075	9,641	1919	13,480	125,191	1,559	220	2,749	30,068	
	1914	15	40	.....	138,938	( <sup>1</sup> )	765	1914	20,143	88,800	1,057	3,348	( <sup>1</sup> )	49,809	
Colorado.....	1919	205	1,065	.....	.....	87	80	1919	1,440	67,532	110	356	2,694	.....	
	1914	.....	5,579	.....	87	( <sup>1</sup> )	.....	1914	3,225	60,442	65	1,908	( <sup>1</sup> )	46	
Connecticut.....	1919	1,678	5,418	120	.....	608	240	1919	304	213,488	124	256	1,095	81,689	
	1914	1,779	6,989	22	373	( <sup>1</sup> )	328	1914	1,551	65,755	131	2,074	( <sup>1</sup> )	150,278	
Delaware.....	1919	26	354	.....	73	.....	.....	1919	2	14,235	.....	153	207	61,627	
	1914	.....	305	.....	6	( <sup>1</sup> )	.....	1914	554	7,838	.....	349	( <sup>1</sup> )	12,434	
District of Columbia.....	1919	496	575	.....	.....	71	400	1919	69	2,745	8	177,136	4,011	100	
	1914	.....	930	.....	1	( <sup>1</sup> )	1,131	1914	.....	.....	.....	63,587	( <sup>1</sup> )	.....	
Florida.....	1919	.....	5,190	.....	4,010	650	.....	1919	14,416	119,962	58	387	6,164	50,366	
	1914	.....	2,625	.....	1,379	.....	348	1914	17,050	99,848	178	2,885	( <sup>1</sup> )	56,438	
Georgia.....	1919	.....	18,133	.....	535	3,707	.....	1919	291	1,142	3	4	20	342	
	1914	300	15,839	.....	572	( <sup>1</sup> )	22	1914	201	1,035	.....	56	( <sup>1</sup> )	1,247	
Idaho.....	1919	.....	11,441	.....	6,386	419	.....	1919	675	66,862	360	281	750	.....	
	1914	.....	799	.....	133	( <sup>1</sup> )	.....	1914	45	15,002	85	69	( <sup>1</sup> )	.....	
Illinois.....	1919	746	42,657	6	409	797	837	1919	.....	102	.....	4,800	88	.....	
	1914	1,631	53,076	388	1,347	( <sup>1</sup> )	2,115	1914	8	31	.....	176	( <sup>1</sup> )	.....	
Indiana.....	1919	10	38,804	180	133	1,106	1,725	1919	2,125	677,879	.....	3	624	.....	
	1914	99	55,570	.....	1,840	( <sup>1</sup> )	5,672	1914	.....	42,726	282	329	( <sup>1</sup> )	677	
Iowa.....	1919	11	16,884	54	25	61	.....	1919	788	23,445	.....	56,204	1,419	6,181	
	1914	2	15,083	10	388	.....	5	1914	880	27,562	480	35,372	( <sup>1</sup> )	5,866	
Kansas.....	1919	9	2,038	.....	.....	100	1,935	1919	133	1,045	.....	211	952	.....	
	1914	.....	3,611	.....	50	( <sup>1</sup> )	15,114	1914	116	2,757	.....	647	( <sup>1</sup> )	.....	
Kentucky.....	1919	52	44,508	.....	416	512	5,416	1919	581	62,719	50	2,190	950	.....	
	1914	366	44,690	8	2,979	( <sup>1</sup> )	18,542	1914	27	67,423	353	754	( <sup>1</sup> )	.....	
Louisiana.....	1919	1,550	72,837	.....	49,471	5,352	4,254	1919	67	71,729	12	348,262	8,838	.....	
	1914	3,767	102,463	30	9,001	( <sup>1</sup> )	25,221	1914	70	30,514	.....	203,784	( <sup>1</sup> )	18,864	
Maine.....	1919	438	2,404	.....	17,8	1,497	.....	1919	1,796	101,318	.....	28	280	119,120	
	1914	533	1,827	.....	1,380	( <sup>1</sup> )	.....	1914	.....	123,325	.....	642	( <sup>1</sup> )	69,133	
Maryland.....	1919	49	3,630	314	22	468	3,160	1919	1,654	90,225	55	281	1,164	1,770	
	1914	403	16,888	.....	141	( <sup>1</sup> )	3,442	1914	1,515	68,192	45	1,531	( <sup>1</sup> )	4,667	
Massachusetts.....	1919	1,898	13,177	209	85	1,309	2,264	1919	.....	68	.....	.....	49	227	
	1914	1,180	19,722	85	1,181	( <sup>1</sup> )	1,642	1914	.....	60	.....	.....	2	.....	
Michigan.....	1919	767	89,200	4	269	1,157	1,522	1919	3	393	.....	14,181	77	.....	
	1914	1,322	112,132	944	2,122	( <sup>1</sup> )	3,233	1914	5	1,008	.....	6,538	( <sup>1</sup> )	.....	
Minnesota.....	1919	1,543	14,727	.....	.....	.....	.....	1919	.....	.....	.....	37	8,455	14	
	1914	361	19,556	.....	.....	.....	.....	1914	.....	.....	.....	716	( <sup>1</sup> )	.....	
Mississippi.....	1919	760	67,171	1,032	268	1,697	.....	1919	.....	.....	.....	685	( <sup>1</sup> )	2	
	1914	.....	37,513	.....	.....	.....	.....	1914	.....	.....	.....	.....	.....	.....	
Missouri.....	1919	84	31,522	60	2,200	887	2,687	1919	14	34,568	1,061	3,581	( <sup>1</sup> )	4,380	
	1914	.....	.....	.....	.....	.....	.....	1914	.....	.....	.....	.....	.....	.....	
Montana.....	1919	.....	7,069	.....	.....	.....	.....	1919	.....	.....	.....	90	95	.....	
	1914	.....	3,362	.....	.....	.....	.....	1914	.....	.....	.....	.....	.....	.....	
Nebraska.....	1919	9	2,155	105	.....	.....	.....	1919	9	2,155	105	.....	242	.....	
	1914	30	2,601	.....	.....	.....	.....	1914	30	2,601	.....	194	( <sup>1</sup> )	362	
New Hampshire.....	1919	343	837	166	.....	.....	.....	1919	343	837	166	.....	2,314	.....	
	1914	95	1,262	.....	.....	.....	.....	1914	95	1,262	.....	528	( <sup>1</sup> )	353	
New Jersey.....	1919	4,518	9,061	339	5,172	2,462	9,196	1919	4,518	9,061	339	5,172	2,462	9,196	
	1914	7,284	16,400	.....	940	( <sup>1</sup> )	11,628	1914	7,284	16,400	.....	940	( <sup>1</sup> )	11,628	
New Mexico.....	1919	.....	6,911	.....	.....	34	.....	1919	.....	6,911	.....	.....	34	.....	
	1914	.....	684	.....	.....	17	.....	1914	.....	684	.....	.....	17	.....	
New York.....	1919	13,480	125,191	1,559	220	2,749	30,068	1919	13,480	125,191	1,559	220	2,749	30,068	
	1914	20,143	88,800	1,057	3,348	( <sup>1</sup> )	49,809	1914	20,143	88,800	1,057	3,348	( <sup>1</sup> )	49,809	
North Carolina.....	1919	1,440	67,532	110	356	2,694	.....	1919	1,440	67,532	110	356	2,694	.....	
	1914	3,225	60,442	65	1,908	( <sup>1</sup> )	46	1914	3,225	60,442	65	1,908	( <sup>1</sup> )	46	
Ohio.....	1919	304	213,488	124	256	1,095	81,689	1919	304	213,488	124	256	1,095	81,689	
	1914	1,551	65,755	131	2,074	( <sup>1</sup> )	150,278	1914	1,551	65,755	131	2,074	( <sup>1</sup> )	150,278	
Oklahoma.....	1919	2	14,235	.....	153	207	61,627	1919	2	14,235	.....	153	207	61,627	
	1914	554	7,838	.....	349	( <sup>1</sup> )	12,434	1914	554	7,838	.....	349	( <sup>1</sup> )	12,434	
Oregon.....	1919	69	2,745	8	177,136	4,011	100	1919	69	2,745	8	177,136	4,011	100	
	1914	.....	.....	.....	63,587	( <sup>1</sup> )	.....	1914	.....	.....	.....	63,587	( <sup>1</sup> )	.....	
Pennsylvania.....	1919	14,416	119,962	58	387	6,164	50,366	1919	14,416	119,962	58	387	6,164	50,366	
	1914	17,050	99,848	178	2,885	( <sup>1</sup> )	56,438	1914	17,050	99,848	178	2,885	( <sup>1</sup> )	56,438	
Rhode Island.....	1919	291	1,142	3	4	20	342	1919							

SPECIAL STATISTICS.

Stumpage and sawlog values.—Table 13 shows that the average cost per 1,000 feet of stumpage for 1919 was nearly 100 per cent greater than that reported for 1904. This large increase in stumpage cost, however, was more than equaled by the advance in the cost of other logging expenses, due undoubtedly to the cutting out of the timber supply nearest to market. Accessibility has an important bearing on the market value of stumpage, as the cost of transporting logs from

the woods to the mills is an important item in the lumber industry.

Great variations may occur in stumpage costs, especially in states where lumbering is not important, for the reason that certain species are of much greater value than others, and the cut during a particular year may have been principally from either a high or a low priced wood. Figures showing the stumpage cost by kinds of wood, however, are not available.

TABLE 13.—STUMPAGE VALUES, BY STATES, GROUPED ACCORDING TO PRINCIPAL TIMBER REGIONS: 1919, 1904, AND 1899.

GROUP AND STATE.	1919	1904	1899	GROUP AND STATE.	1919	1904	1899
United States.....	\$5.02	\$2.59	\$2.18	Southern group—Continued.			
Northeastern group:				Oklahoma.....	\$2.94	( <sup>1</sup> )	\$2.54
Connecticut.....	7.30	4.15	2.90	Texas.....	5.46	\$1.78	1.17
Delaware.....	9.07	3.34	3.53	North Carolina pine group:			
Maryland.....	7.42	4.17	2.92	North Carolina.....	5.64	1.92	1.34
Maine.....	8.79	3.70	2.52	South Carolina.....	4.84	1.65	1.23
Massachusetts.....	8.33	4.19	2.64	Virginia.....	5.63	2.15	1.79
New Hampshire.....	10.36	4.28	2.68	Lake States group:			
New Jersey.....	6.38	5.34	3.93	Michigan.....	7.52	3.79	3.06
New York.....	8.62	4.54	3.12	Minnesota.....	10.03	4.65	3.40
Pennsylvania.....	9.10	4.36	2.94	Wisconsin.....	5.28	4.14	3.51
Rhode Island.....	8.04	4.12	3.02	Pacific group:			
Vermont.....	7.54	3.93	2.09	California.....	2.67	1.39	1.16
Central group:				Nevada.....	3.00	1.49	1.04
Illinois.....	8.59	2.84	2.64	Oregon.....	2.69	0.96	0.66
Indiana.....	15.59	7.65	5.39	Washington.....	3.07	1.07	0.80
Kentucky.....	7.56	3.78	2.67	Rocky Mountain group:			
Missouri.....	6.35	1.43	1.89	Arizona.....	2.85	2.36	1.03
Ohio.....	10.54	6.77	4.92	Colorado.....	3.01	1.43	1.12
Tennessee.....	6.77	3.48	2.18	Idaho.....	3.18	1.39	1.09
West Virginia.....	5.96	3.13	2.36	Montana.....	2.45	1.33	1.18
Southern group:				New Mexico.....	2.62	2.24	1.14
Alabama.....	4.18	1.55	1.20	Utah.....	2.49	1.29	1.32
Arkansas.....	5.55	1.79	1.09	Wyoming.....	2.48	1.50	1.27
Florida.....	5.01	1.83	1.22	All other:			
Georgia.....	4.91	1.68	1.01	Iowa.....	4.69	5.11	4.95
Louisiana.....	5.95	2.26	1.22	Kansas.....	* 31.86	( <sup>1</sup> )	2.17
Mississippi.....	5.41	2.00	1.30	Nebraska.....	8.45	3.00	2.29
				South Dakota.....	2.44	1.97	1.80

<sup>1</sup> Not reported.

\* Principally walnut.

Value of products.—The figures shown in Table 14 for 1919 do not include the value of sawlogs produced in the logging camps conducted by sawmill operators and sawed into lumber in the mill operated by the same establishment, but give the value of the products as marketed. Likewise, the value of rough lumber, cooperage stock, and veneers produced and used in remanufacturing plants operated by the same establishment are not shown but included in the value of finished products. Consequently there is no dupli-

cation in the value of products except as the finished product of one establishment may be used as material by another.

In addition to the values of products shown in the table, planing-mill products valued at \$5,387,877 were reported by establishments engaged primarily in the manufacture of other products, also wooden packing boxes valued at \$13,020,855 were manufactured and reported by other industries.

TABLE 14.—VALUE OF PRODUCTS, BY STATES: 1919.

STATE.	Total.	LOGGING CAMPS.			SAWMILLS.					PLANING MILLS.		Box factories.	Miscellaneous products, other than lumber and timber products.
		Sawlogs.	Other timber products. <sup>1</sup>	Contract logging.	Rough lumber, lath, and shingles.	Tight and slack coopersage stock.	Veneers.	Other sawmill products.	Contract or custom sawing.	Operated in conjunction with sawmills.	Independent.		
United States.....	\$2,065,728,125	\$394,740,320	\$38,670,774	\$7,828,214	\$701,060,802	\$16,624,549	\$45,414,437	\$9,017,022	\$10,364,493	\$432,233,873	\$500,438,258	\$177,818,454	\$601,922
Alabama.....	61,316,564	755,504	156,173	144,430	26,293,781	3,141,210	2,078,544	108,429	415,620	21,930,290	5,702,022	475,180	115,381
Arizona.....	2,079,309	.....	539	.....	1,709,405	.....	.....	38,314	250	566,500	364,301	.....	.....
Arkansas.....	91,851,807	1,592,584	329,748	81,023	38,361,837	13,671,250	3,803,735	211,945	412,591	25,512,305	7,064,701	778,767	81,222
California.....	99,051,649	830,366	1,436,231	1,114	27,230,059	771,961	219,892	416,160	22,306	16,364,673	42,832,201	8,908,686	.....
Colorado.....	4,107,689	121,687	565,945	1,903	1,144,258	.....	.....	17,890	8,593	590,446	1,572,132	174,226	.....
Connecticut.....	10,143,546	22,586	120,150	61,513	1,750,971	.....	.....	11,109	156,881	143,845	7,478,358	398,633	.....
Delaware.....	1,715,658	3,750	226,142	4,963	492,761	5,400	.....	550	16,882	340,702	183,624	440,794	.....
District of Columbia.....	860,380	.....	.....	.....	.....	.....	.....	.....	.....	.....	800,389	.....	.....
Florida.....	50,409,154	808,121	504,787	102,928	24,034,149	330,561	2,859,226	243,300	46,859	13,652,916	5,270,931	2,539,732	6,56
Georgia.....	43,051,050	441,632	494,540	513,253	17,761,987	641,935	739,634	10,424	660,670	5,513,329	14,026,180	2,185,691	28,97
Idaho.....	30,784,851	3,416,690	926,705	154,637	8,502,447	.....	.....	193,903	20,847	16,872,398	555,343	141,881	.....
Illinois.....	59,775,441	57,233	98,277	1,288	2,010,122	209,357	3,328,076	78,072	59,788	487,967	34,588,576	18,856,688	.....
Indiana.....	35,042,583	107,128	70,018	4,036	10,833,809	253,623	4,391,135	108,646	330,990	1,667,451	7,500,347	3,164,648	.....
Iowa.....	17,893,148	.....	4,933	150	914,766	16,518	.....	24,320	8,027	.....	16,387,832	634,632	1,98
Kansas <sup>2</sup> .....	3,932,677	.....	.....	.....	.....	.....	.....	.....	.....	.....	2,107,070	1,825,607	.....
Kentucky.....	33,836,475	604,213	310,520	78,310	16,063,579	1,463,398	3,205,996	40,127	519,537	801,547	8,555,044	1,696,895	106,40
Louisiana.....	130,459,772	3,116,280	1,060,398	380,578	51,216,172	2,511,550	321,084	126,059	4,140	61,026,078	5,570,041	4,173,296	14,24
Maine.....	36,388,864	826,361	1,016,686	102,677	14,455,060	759,552	1,013,464	223,568	299,919	8,803,535	3,329,713	4,643,880	60
Maryland.....	18,636,487	29,728	430,802	26,447	2,545,595	249,403	751,825	12,415	82,306	494,486	7,500,347	6,503,613	52
Massachusetts.....	33,408,778	44,243	74,069	169,587	2,769,544	275,725	247,892	101,580	300,680	1,707,098	12,025,323	15,050,631	.....
Michigan.....	88,890,645	3,872,169	3,403,634	121,971	25,633,072	836,101	1,063,207	1,222,313	362,092	9,486,988	37,880,230	4,977,660	40,53
Minnesota.....	52,379,620	3,720,805	5,414,446	404,895	17,241,290	358,615	1,331,560	226,510	137,806	9,083,097	11,804,330	3,454,236	.....
Mississippi.....	94,500,553	2,534,813	331,210	40,305	47,893,491	2,082,451	1,830,790	115,357	102,400	31,898,508	5,933,133	1,059,191	18,66
Missouri.....	33,665,365	346,991	662,779	62,476	7,885,980	2,410,560	1,221,920	84,385	251,628	1,087,442	12,317,666	7,311,774	11,28
Montana <sup>3</sup> .....	12,106,981	1,142,871	1,127,815	224,250	2,424,890	.....	.....	.....	41,898	5,962,840	1,205,349	.....	.....
Nbraska.....	2,749,074	.....	.....	.....	.....	.....	.....	.....	1,209	.....	2,181,836	556,201	.....
New Hampshire.....	24,269,530	536,271	2,240,054	287,673	7,177,221	773,546	104,233	554,106	527,721	2,790,745	2,136,905	7,080,659	46
New Jersey.....	22,002,444	28,206	374,092	3,250	1,075,238	64,700	72,199	8,441	28,307	833,219	10,768,566	8,756,166	.....
New Mexico.....	2,971,101	10,826	217,815	160,010	1,334,580	.....	.....	.....	6,893	1,018,320	192,665	.....	.....
New York.....	82,508,191	981,524	1,618,612	48,134	9,869,882	570,727	2,403,107	250,663	546,344	2,121,924	49,440,840	14,652,388	8,04
North Carolina.....	69,554,024	1,630,583	526,828	1,011,830	36,432,812	1,102,244	3,028,971	92,313	1,585,210	9,504,025	11,439,082	3,186,720	13,46
Ohio.....	53,366,914	137,453	72,648	34,972	8,431,110	668,489	808,502	39,015	347,661	1,476,316	32,428,847	8,996,596	15,94
Oklahoma <sup>4</sup> .....	8,053,721	24,645	133,747	11,415	1,278,375	7,500	.....	6,365	17,273	3,417,563	3,149,898	.....	6,96
Oregon.....	95,264,297	10,925,847	357,838	519,294	42,067,771	1,577,471	663,973	643,365	67,505	28,525,147	5,804,349	4,112,237	.....
Pennsylvania.....	67,712,658	620,372	2,905,927	183,400	18,780,712	1,125,128	104,589	431,311	432,273	446,871	35,124,866	7,556,989	2
Rhode Island.....	2,976,669	.....	21,524	.....	105,189	.....	.....	1,725	26,164	27,723	1,712,328	1,022,016	.....
South Carolina.....	26,693,955	371,430	8,906	134,726	11,844,566	154,310	1,006,078	21,798	268,880	7,939,701	4,559,924	371,663	11,94
South Dakota.....	2,632,113	270,027	84,224	1,200	467,023	.....	.....	41,406	2,128	902,738	813,372	.....	.....
Tennessee.....	52,787,992	314,514	643,439	268,076	25,051,097	4,927,106	2,976,375	110,847	643,260	3,541,272	12,370,682	1,022,079	29,84
Texas.....	61,104,882	240,847	970,018	2,761	15,220,575	704,861	287,726	42,667	13,822	30,392,814	9,792,439	3,428,162	2,11
Utah <sup>5</sup> .....	1,337,573	2,214	111,827	.....	250,307	.....	.....	925	4,192	17,805	960,303	.....	.....
Vermont.....	13,142,380	280,507	19,809	22,095	4,094,136	42,547	751,757	60,413	204,045	1,016,971	2,846,673	1,034,066	67,46
Virginia.....	56,393,588	351,176	1,513,858	307,447	25,439,655	2,591,876	623,435	196,208	574,389	4,785,516	11,773,016	9,231,697	5,31
Washington.....	234,825,057	48,946,545	1,262,472	1,970,581	87,787,609	290,753	694,870	1,368,376	178,044	78,045,133	10,031,701	3,380,997	.....
West Virginia.....	46,314,007	693,011	3,065,361	105,896	20,075,766	408,331	504,050	271,179	171,433	2,214,559	10,000,224	685,260	9,94
Wisconsin.....	88,882,283	3,850,561	2,090,450	69,127	27,314,562	980,019	4,173,715	1,168,701	393,420	17,120,735	20,546,990	11,114,459	63,46
Wyoming.....	1,228,694	46,508	789,618	2,896	168,344	.....	.....	100	7,882	10,573	203,775	.....	.....
All other states <sup>6</sup> .....	1,727,024	.....	.....	.....	711,783	.....	.....	21,489	.....	348,717	251,773	394,162	.....

<sup>1</sup> Includes poles, posts, piling, masts, hewn cross-ties, mine timbers, spars, wheel stock, handle stock, excelsior stock, pulp wood, etc.

<sup>2</sup> Excludes the value of products manufactured during 1919 and used as materials in further manufacture by the establishment reporting.

<sup>3</sup> Excludes statistics for 2 establishments to avoid disclosure of individual operations.

<sup>4</sup> Excludes statistics for 1 establishment to avoid disclosure of individual operations.

<sup>5</sup> Includes establishments in Kansas, Montana, Nevada, North Dakota, Oklahoma, and Utah.

## PRODUCTION OF LUMBER, LATH, AND SHINGLES.

Annual statistics for lumber, lath, and shingles have been published by the Bureau of the Census or by the Forest Service for 16 years, from 1904 to 1919, inclusive.<sup>1</sup> During this period the manner of presenting the information has been standardized. In this report statistics are presented, so far as practicable, in the same way as for previous years in order to retain their comparability.

The data for each census year were collected largely by special agents of the Bureau of the Census. For the other years for which statistics are given the returns were secured mostly by correspondence, except for New York. The figures for that state were furnished by the New York Conservation Commission.

At the beginning of 1919, the conditions in the lumber industry were unsettled, due largely to the fact that during the greater part of 1918 the products of the sawmills were diverted from the ordinary trade requirements to channels essential for winning the war. Private building operations had been greatly curtailed for this and various other reasons. The lessened demand for lumber by the National Government for emergency war purposes after the signing of the armistice was keenly felt.

The private use of lumber by woodworking industries and by the building trade, however, increased as the year progressed. This increased demand together with a shortage of stock in certain lines caused a sharp advance in prices.

Statistics covering 128 of the principal cities in the United States show a great increase in building operations for 1919 compared with 1918, when the number of building permits and the cost of improvements were the smallest in 20 years. The increase in the number of building permits issued in these 128 cities was approximately 69 per cent, and the increase in the cost of the improvements was about 205 per cent.<sup>2</sup>

During 1919 the production of lumber and timber products was materially restricted by shortage and high cost of labor, curtailed credits, and inadequate shipping facilities. Unfavorable weather also greatly affected logging operations.

<sup>1</sup> Statistics were published by the Bureau of the Census for the years 1904 and 1906 to 1912, inclusive; by the Forest Service for 1905, 1913, and 1915 to 1918, inclusive. Data for the 1914 lumber production were collected by the Bureau of the Census in connection with the quinquennial census of manufactures and published by the Forest Service together with its annual report for 1915. The statistics for 1913 and 1914 did not include data for lath and shingles.

<sup>2</sup> For 1919 the Bureau of the Census, Department of Commerce, and the Forest Service, United States Department of Agriculture, cooperated in compiling these statistics of production.

The number of establishments as shown in the general statistics (Tables 1 to 12) in this report are not comparable with the number of mills shown in the following special statistics of products. The number of establishments reported in the general statistics include timber camps which were not shown in the tables giving production statistics of mills, also frequently two or more mills were operated by one establishment and counted as separate units in the production statistics.

## LUMBER.

Comparative production (Table 15).—The production of lumber for each tenth year from 1869 to 1909, inclusive, and for each year since, including 1919, is shown in Table 15 for the principal lumber-producing regions of the United States.

The data are interesting as indicating the period of greatest activity in each region during the past half century. In 1869 the northeastern group of states produced nearly two-fifths of the total quantity of lumber cut in the United States. The Lake states produced more than one-fourth of the total and were developing rapidly.

Ten years later these two regions were still leading, and together produced more than 60 per cent of the total cut for the country. At this time, however, the proportions were practically reversed, the Lake states reporting the greatest production. The last-named region was also the largest producer in 1889 and 1899. The southern group ranked first in 1909 and this region has occupied first position since, producing annually about one-third of the total lumber cut.

The development of the lumber industry in the North Carolina pine group has practically run parallel with the development in the southern group. The peak of the production probably has been passed in both regions.

The growth of the lumber industry in the Pacific states has been rapid. This region contributed 4.4 per cent of the total cut in 1869 and 25.5 per cent in 1919. This is the only region for which a greater production was reported in 1919 than for any previous year.

The production in the Central states has decreased from 17.9 per cent of the total in 1869 to 8.7 per cent in 1919.

The greatest production in the Rocky Mountain states was reported for 1916. However, an increased

<sup>2</sup> Data from bulletin on "Building Operations in the Larger Cities, 1919," Department of the Interior, U. S. Geological Survey.

output may be looked for from this region, since the peak of the production probably has not been reached in several of the states in this group. In the group designated as "All other states," the lumber industry is of minor importance, primarily on account of the limited timber supply.

The figures shown in Table 15 are fairly comparable, although they were compiled by two different agen-

cies—the Bureau of the Census and the Forest Service. From 1910 to 1918, inclusive, the cut of small mills each manufacturing less than 50,000 feet of lumber per year was omitted from the statistics. In addition, the cut of custom mills was omitted for 1914. The cut of the small mills mentioned above, however, was unimportant and would not affect the comparability of the figures to any appreciable extent.

TABLE 15.—QUANTITY AND PER CENT DISTRIBUTION OF LUMBER CUT IN THE UNITED STATES, BY GROUPS OF STATES, FOR SPECIFIED YEARS: 1869 TO 1919.

YEAR.	Total quantity <sup>1</sup> (M feet b. m.).	GROUP.															
		Northeastern states. <sup>2</sup>		Central states. <sup>3</sup>		Southern states. <sup>4</sup>		North Carolina pine states. <sup>5</sup>		Lakelates. <sup>6</sup>		Pacific states. <sup>7</sup>		Rocky Mountain states. <sup>8</sup>		All other states. <sup>9</sup>	
		Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.
1919.....	34,552,070	2,583,873	7.5	3,015,887	8.7	12,704,483	36.8	3,374,152	9.8	2,091,868	7.8	8,818,321	25.5	1,298,684	3.8	64,808	0.2
1918.....	31,890,494	2,373,600	7.4	2,490,000	7.8	11,135,000	34.9	2,640,000	8.3	3,220,000	10.1	8,590,457	26.9	1,389,303	4.4	52,194	0.1
1917.....	35,831,239	2,488,146	7.0	2,605,000	7.4	13,000,000	38.8	3,285,000	9.1	3,525,000	9.8	8,570,508	23.9	1,370,789	3.8	46,736	0.1
1916.....	39,807,251	3,115,237	7.8	3,315,000	8.3	15,325,000	38.5	4,292,000	10.8	4,050,000	10.2	8,136,000	20.4	1,523,830	3.8	50,184	0.1
1915.....	37,011,656	3,775,000	10.2	3,670,000	9.9	13,590,000	36.7	4,390,000	11.9	3,410,000	9.2	6,770,000	18.3	1,349,094	3.6	57,562	0.1
1914.....	37,340,023	3,553,092	9.5	3,621,339	9.7	13,383,523	35.8	4,417,464	11.8	3,917,666	10.5	7,007,247	18.9	1,330,833	3.6	45,859	0.1
1913.....	38,387,000	3,097,061	8.1	3,930,847	10.2	14,328,810	37.3	3,983,895	10.4	3,866,040	10.1	7,873,900	20.5	1,246,716	3.2	60,240	0.1
1912.....	39,158,414	3,712,557	9.5	4,338,449	11.1	13,537,894	34.6	4,580,235	11.7	4,424,429	11.3	7,218,994	18.4	1,255,752	3.2	90,104	0.2
1911.....	37,008,207	3,634,743	9.8	4,237,791	11.5	12,221,970	33.0	3,743,390	10.1	4,713,755	12.7	7,076,013	19.1	1,290,743	3.5	84,806	0.2
1910.....	40,018,282	3,954,067	9.9	4,674,967	11.7	13,248,679	33.1	4,183,745	10.4	5,030,106	12.6	7,436,951	18.6	1,385,387	3.5	104,380	0.2
1909.....	44,509,761	5,197,012	11.7	5,487,105	12.3	14,795,731	33.3	5,177,091	11.6	5,476,270	12.3	6,905,418	15.5	1,292,050	2.9	179,024	0.4
1899.....	35,077,595	5,709,224	16.3	5,643,379	16.1	8,403,802	24.0	3,717,228	10.6	8,749,842	24.9	2,901,330	8.3	556,367	1.6	401,465	1.1
1889.....	23,842,230	4,725,508	19.8	3,129,988	13.1	3,717,728	15.6	1,128,968	4.7	8,250,702	34.6	2,027,848	8.5	249,431	1.1	611,997	2.6
1879.....	18,091,856	4,642,656	25.8	3,349,232	18.4	1,754,956	9.7	743,533	4.1	6,278,567	34.7	663,687	3.6	153,995	0.9	504,730	2.8
1869.....	12,755,543	4,557,428	35.7	2,284,423	17.9	923,489	7.2	364,261	2.9	3,592,202	28.2	557,778	4.4	58,796	0.5	417,168	3.3

<sup>1</sup> Computed by the Forest Service, Department of Agriculture, for 1915 to 1918, inclusive.  
<sup>2</sup> Northeastern group—Connecticut, Delaware, Maryland, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.  
<sup>3</sup> Central group—Illinois, Indiana, Kentucky, Missouri, Ohio, Tennessee, and West Virginia.  
<sup>4</sup> Southern group—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, and Texas.  
<sup>5</sup> North Carolina pine group—North Carolina, South Carolina, and Virginia.  
<sup>6</sup> Lakelates group—Michigan, Minnesota, and Wisconsin.  
<sup>7</sup> Pacific group—California, Nevada, Oregon, and Washington.  
<sup>8</sup> Rocky Mountain group—Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming.  
<sup>9</sup> All other—Iowa, Kansas, Nebraska, South Dakota, North Dakota, and District of Columbia.

Production of lumber, by classes of mills (Table 16).—Statistics have been presented for a number of years for sawmills divided into classes according to the quantity cut. A comparative summary for five classes is presented in Table 16. For 1919 data pertaining to

2,655 mills cutting less than 50,000 feet each per year were omitted to make the figures comparable with those for previous years. These small mills reported total cut of 84,567,000 feet, only two-tenths of 1 per cent of the total lumber cut of the United States.

TABLE 16.—NUMBER OF MILLS OPERATING AND PRODUCTION OF LUMBER, BY CLASSES OF MILLS: 1914 TO 1919

CLASS AND YEAR.	MILLS. <sup>1</sup>		QUANTITY CUT. <sup>1</sup>		CLASS AND YEAR.	MILLS. <sup>1</sup>		QUANTITY CUT. <sup>1</sup>	
	Number operating.	Per cent.	M feet b. m.	Per cent.		Number operating.	Per cent.	M feet b. m.	Per cent.
<b>All classes:</b>									
1919.....	26,879	100.0	34,467,509	100.0	Class 3—Mills cutting from 1,000 M to 4,999 M feet:				
1918.....	22,546	100.0	31,890,494	100.0	1919.....	3,211	11.9	5,972,196	17.3
1917.....	24,315	100.0	35,831,239	100.0	1918.....	2,194	9.7	4,270,755	12.3
1916.....	30,081	100.0	39,807,251	100.0	1917.....	2,352	9.5	4,615,941	13.4
1915.....	29,951	100.0	37,011,656	100.0	1916.....	3,041	10.1	5,888,675	17.1
1914.....	27,506	100.0	37,340,023	100.0	1915.....	3,191	10.7	6,201,884	18.0
					1914.....	3,291	12.0	6,078,730	17.6
<b>Class 5—Mills cutting over 10,000 M feet:</b>					<b>Class 2—Mills cutting from 800 M to 999 M feet:</b>				
1919.....	702	2.9	18,814,099	54.6	1919.....	3,977	14.8	2,662,855	7.7
1918.....	785	3.5	18,970,552	59.5	1918.....	3,183	14.1	2,138,005	6.1
1917.....	899	3.6	22,148,670	61.8	1917.....	3,689	14.0	2,460,685	7.1
1916.....	925	3.1	23,310,137	68.6	1916.....	4,594	15.3	3,096,760	8.9
1915.....	846	2.8	20,669,746	59.8	1915.....	4,198	14.0	2,941,264	8.5
1914.....	897	3.2	20,934,446	60.8	1914.....	4,261	15.5	2,780,184	7.9
<b>Class 4—Mills cutting from 5,000 M to 9,999 M feet:</b>					<b>Class 1—Mills cutting from 50 M to 499 M feet:</b>				
1919.....	503	1.9	3,544,609	10.3	1919.....	18,396	68.4	3,473,750	10.0
1918.....	505	2.2	3,537,104	11.2	1918.....	15,870	70.4	2,944,078	8.5
1917.....	459	1.8	3,300,602	9.4	1917.....	17,416	70.2	3,245,541	9.4
1916.....	484	1.6	3,513,707	9.8	1916.....	21,037	99.0	4,027,912	11.7
1915.....	453	1.5	3,224,448	8.7	1915.....	21,263	71.0	3,974,334	11.5
1914.....	547	2.0	3,910,370	10.5	1914.....	18,540	67.4	3,642,293	10.5

<sup>1</sup> Exclusive of mills cutting less than 50 M feet per year; figures for 1915 to 1918, inclusive, were computed by the Forest Service, Department of Agriculture.

The data for 1919 and 1914 are based on reports received by the Bureau of the Census, while those for 1915 to 1918, inclusive, were obtained by the extension of figures based on actual returns so as to show totals for approximately all sawmills, whether or not reports were received from them. These computed figures were compiled by the Forest Service. The data for custom mills were omitted from the statistics for 1914.

It will be noted that considerably over one-half of the total lumber production for 1919 was reported by fewer than 800 mills. The cut of mills producing over 10,000,000 feet per year was less in 1919 than for any previous year shown in the table. The largest increase in any one class is shown for class 3—mills cutting from 1,000,000 feet to 4,999,000 feet. The proportion

of the total lumber cut produced by mills of this class in 1919 was greater than the proportion contributed by the same class of mills in any other year shown in the table. Mills cutting from 50,000 feet to 499,000 feet were by far the most numerous, 68.4 per cent of the total number coming within this class. However, their total output amounted to slightly more than 10 per cent of the total cut, or about the same proportion of the total cut as that of the mills in class 4, the number of mills in this class being only 1.9 per cent of the total number reporting.

Production, by merchant mills (Table 17).—Establishments manufacturing lumber from logs or bolts owned by them and large establishments doing contract sawing are classified as merchant mills. These mills produced 98 per cent of the total cut in 1919.

TABLE 17.—MERCHANT SAWMILLS CLASSIFIED ACCORDING TO REPORTED QUANTITY OF LUMBER CUT, BY STATES: 1919.

STATE.	AGGREGATE.		CLASS 5. MILLS CUTTING OVER 10,000 M FEET.		CLASS 4. MILLS CUTTING FROM 5,000 M TO 9,999 M FEET.		CLASS 3. MILLS CUTTING FROM 1,000 M TO 4,999 M FEET.		CLASS 2. MILLS CUTTING FROM 500 M TO 999 M FEET.		CLASS 1. MILLS CUTTING FROM 50 M TO 499 M FEET.		MILLS CUTTING LESS THAN 50 M FEET.	
	Number of active mills re- porting.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).
United States.....	24,153	33,842,846	792	18,814,099	503	3,544,609	3,208	5,968,135	3,932	2,636,656	13,985	2,824,549	1,733	54,798
Alabama.....	1,010	1,705,314	25	493,012	35	260,925	374	668,104	254	167,252	843	173,498	79	2,523
Arizona.....	20	73,655	4	65,085			2		14	1,8570				
Arkansas.....	1,341	1,758,416	39	867,499	29	200,349	203	377,549	233	161,665	741	148,345	96	3,009
California.....	158	1,259,393	32	1,067,842	12	87,080	32	81,429	16	10,085	60	12,735	6	192
Colorado.....	130	64,299			1		14	37,043	18	12,936	74	13,650	23	665
Connecticut.....	177	79,980					23	32,006	40	27,344	96	20,035	18	575
Delaware.....	74	25,205			1				8	11,361	59	13,672	5	172
Florida.....	414	1,136,310	33	617,690	29	204,765	106	231,488	74	50,677	151	31,064	21	626
Georgia.....	1,436	856,087	9	121,043	19	124,630	172	276,204	244	160,548	897	170,575	95	3,817
Idaho.....	174	764,651	22	660,686	5	37,605	18	39,428	12	9,047	94	17,075	23	80
Illinois.....	154	55,811					10	20,649	26	16,696	103	18,025	15	441
Indiana.....	481	250,751			1		66	127,482	97	64,220	298	58,454	20	595
Iowa.....	31	11,703					1		1	9,125	19	2,406	8	232
Kentucky.....	859	457,910	4	61,201	8	58,759	62	121,210	165	111,088	553	103,574	67	2,078
Louisiana.....	472	3,163,349	97	2,509,125	47	316,382	111	267,703	59	40,557	144	29,146	14	436
Maine.....	583	575,781	6	91,238	11	70,675	135	265,257	116	84,539	282	62,882	38	1,190
Maryland.....	375	99,071			1		12	22,661	37	23,697	277	51,129	43	1,584
Massachusetts.....	246	162,306			1		63	99,834	50	35,901	123	26,284	8	287
Michigan.....	272	860,723	32	513,846	27	190,101	51	117,035	23	15,471	123	23,777	16	493
Minnesota.....	167	606,992	17	64,488	9	64,488	17	33,332	20	13,293	93	16,344	11	389
Mississippi.....	1,370	2,330,303	64	1,315,434	33	266,894	270	480,853	258	171,636	686	143,527	60	1,959
Missouri.....	511	289,286	3	45,021	7	52,394	39	77,030	70	47,331	331	64,911	61	2,049
Montana.....	118	286,385	8	198,957	3	19,784	19	46,930	9	6,992	73	13,532	6	190
New Hampshire.....	318	332,974	4	74,256	1		99	176,959	77	53,724	124	28,653	13	392
New Jersey.....	149	35,546					3	3,506	12	7,598	106	22,970	28	678
New Mexico.....	50	86,808	4	61,424			9	17,176	4	2,909	29	5,147	4	152
New York.....	828	317,257	5	65,157	2		38	84,273	101	65,495	539	97,982	143	4,350
North Carolina.....	2,749	1,582,763	15	221,993	21	157,162	303	487,481	495	324,718	1,840	388,999	76	2,405
Ohio.....	510	241,030	2				47	99,732	106	70,461	327	70,595	23	842
Oklahoma.....	146	167,388	3	107,007	1		14	31,220	18	12,199	65	16,464	15	493
Oregon.....	506	2,577,134	67	2,050,626	28	197,166	115	226,689	81	58,358	197	43,734	18	561
Pennsylvania.....	1,251	593,455	8	179,224	5	44,492	51	76,315	174	115,882	860	172,684	153	4,858
Rhode Island.....	24	10,138					3	3,710	3	2,172	17	4,256	1	
South Carolina.....	613	598,218	10	169,653	20	139,284	90	158,748	110	71,767	301	56,037	32	2,728
South Dakota.....	41	42,970					6	35,709	4	2,779	30	6,482		
Tennessee.....	1,420	737,252	8	107,690	15	102,855	105	200,185	192	127,928	964	104,332	136	4,262
Texas.....	435	1,379,332	50	1,011,244	11	82,957	84	183,806	87	61,201	185	39,598	13	525
Utah.....	79	11,782							3	2,007	61	9,284	15	491
Vermont.....	414	203,012			1		43	72,372	99	66,640	258	63,569	13	425
Virginia.....	1,845	1,050,544	15	273,273	14	104,053	136	212,905	338	220,841	1,187	234,445	155	5,027
Washington.....	591	4,961,175	143	4,205,057	45	318,233	158	351,135	68	48,394	163	37,941	14	415
West Virginia.....	635	750,565	18	293,052	31	212,940	52	106,761	92	58,871	331	77,041	61	1,900
Wisconsin.....	305	1,087,738	43	756,489	24	158,883	49	117,790	36	24,642	140	29,527	13	427
Wyoming.....	52	8,034							2		43	7,870	7	164
All other states <sup>10</sup>	9	23,440	1				1				4	11,234	3	92

<sup>1</sup> Includes cut of 2 mills in class 3.  
<sup>2</sup> Includes cut of 1 mill in class 4.  
<sup>3</sup> Includes cut of 1 mill in class 4 and 1 mill in class 3.  
<sup>4</sup> Includes cut of 1 mill in class 4 and 2 mills in class 3.  
<sup>5</sup> Includes cut of 2 mills in class 4.  
<sup>6</sup> Includes cut of 2 mills in class 5.

<sup>7</sup> Includes cut of 1 mill in class cutting less than 50 M feet.  
<sup>8</sup> Includes cut of 1 mill in class 5.  
<sup>9</sup> Includes cut of 2 mills in class 2.  
<sup>10</sup> Includes Kansas, Nebraska, and Nevada.  
<sup>11</sup> Includes cut of 1 mill in class 5 and 1 mill in class 3.

Of the 792 mills cutting over 10,000,000 feet each per year, 18.1 per cent were in Washington, 12.2 per cent in Louisiana, 8.5 per cent in Oregon, and 8.1 per cent in Mississippi. These four states reported 46.9 per cent of the total number of large mills. In this connection it will be noted that these are also the main lumber-producing states. Louisiana reported the greatest number of mills in class 4, Alabama in class 3, North Carolina in classes 2 and 1, and Virginia in mills cutting less than 50,000 feet each per year.

**Production, by custom mills (Table 18).**—Small establishments engaged primarily in sawing lumber from logs or bolts furnished by others, receiving therefor a toll either in cash or materials, are classified as custom mills. Table 18 shows, by states, the production of

lumber by custom sawmills, classified according to the reported quantity of lumber cut for 1919. The 5,381 mills classified as custom produced only 709,230,000 feet of lumber, an average of 131,803 feet each, their combined production being only 2 per cent of the total for all mills in the United States.

The greatest number of custom mills was reported from North Carolina, and this was the only state which reported such mills sawing over 1,000,000 feet each. Tennessee, New York, and Virginia also reported large numbers of custom mills. These four states reported 31.7 per cent of the total number of custom mills.

Most of the custom mills are small, 82 per cent of the total number reported cutting from 50,000 feet to 499,000 feet each.

TABLE 18.—CUSTOM SAWMILLS, CLASSIFIED ACCORDING TO REPORTED QUANTITY OF LUMBER CUT, BY STATES: 1919.

STATE.	AGGREGATE.		CLASS 2—MILLS CUTTING FROM 500 M TO 999 M FEET.		CLASS 1—MILLS CUTTING FROM 50 M TO 499 M FEET.		MILLS CUTTING LESS THAN 50 M FEET.	
	Number of active mills reporting.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).
United States.....	5,381	709,230	148	30,200	4,411	640,201	922	29,769
Alabama.....	316	33,432			241	30,973	75	2,459
Arkansas.....	106	13,741	1		01	13,204	14	477
Colorado.....	3	505			3	565		
Connecticut.....	53	6,748			30	6,272	14	476
Delaware.....	0	2,232	2		4	2,232		
Florida.....	11	1,122			7	1,012	4	110
Georgia.....	330	37,878	1		271	35,722	64	2,156
Idaho.....	7	737			6	737	1	
Illinois.....	98	8,817	1		58	7,544	39	1,273
Indiana.....	226	31,736	4	2,195	188	28,306	34	1,145
Iowa.....	54	6,730			42	6,340	12	390
Kentucky.....	363	54,108	5	2,610	317	50,195	41	1,363
Louisiana.....	4	522			3	522	1	
Maine.....	93	20,335	10	6,205	75	13,891	8	239
Maryland.....	131	14,291			109	13,619	22	672
Massachusetts.....	27	4,535			26	4,535	1	
Michigan.....	101	15,168	1		88	14,712	12	456
Minnesota.....	188	32,647	0	5,240	165	20,961	14	446
Mississippi.....	72	9,832			61	9,440	11	393
Missouri.....	285	32,097			216	29,888	69	2,209
Montana.....	7	993			7	993		
New Hampshire.....	34	5,893			31	5,673	3	130
New Jersey.....	13	1,342			8	1,174	5	168
New York.....	408	40,597	1		280	30,681	127	3,626
North Carolina.....	465	71,072	18	16,685	413	63,498	44	1,489
Ohio.....	263	38,446			235	37,546	28	900
Oklahoma.....	7	1,015			5	1,015	2	
Pennsylvania.....	278	37,016			237	35,881	41	1,135
Rhode Island.....	6	892			4	892	2	
South Carolina.....	196	23,401			176	22,737	20	724
Tennessee.....	436	54,880			359	52,315	77	2,565
Texas.....	9	442			3	280	6	162
Utah.....	3	135			2	135	1	
Vermont.....	83	15,467	5	3,000	69	12,176	9	291
Virginia.....	369	47,494			321	44,089	78	2,605
West Virginia.....	101	12,538			82	11,950	19	588
Wisconsin.....	184	28,600			164	27,953	20	647
All other states <sup>a</sup> .....	9	1,194			5	1,059	4	135

<sup>1</sup> Includes 3 mills cutting from 1,000 M to 4,999 M feet, their total cut being 4,061 M feet.

<sup>2</sup> Includes the cut of 1 mill in class 2.

<sup>3</sup> Includes the cut of 2 mills in class 2.

<sup>4</sup> Includes the cut of 1 mill in class cutting less than 50 M feet.

<sup>5</sup> Includes the cut of 2 mills in class cutting less than 50 M feet.

<sup>6</sup> Includes Kansas, Nebraska, Oregon, Washington, and Wyoming.

Production of lumber, by states (Table 19).—The cut of lumber for 1919, 1914, and 1909 is shown in Table 19, by states arranged according to their rank in production for 1919. Only seven states reported a larger cut in 1919 than in 1909. With the exception of Alabama and South Dakota all of these states are located in the west coast and Rocky Mountain regions. The decrease in the annual lumber cut is indicated by the fact that only 12 states reported a cut of over 1,000,000,000 feet in 1919, as against 16 states in 1914 and 19 in 1909. The tendency toward large mills is also brought out in this table. The aver-

age cut of all mills reporting in 1919 was 1,169,908 feet, compared with 955,473 feet in 1909. In comparing the average cut per mill for 1914 with the averages for the other two years, the fact that figures for certain small mills were excluded in 1914 should be taken into consideration. All states except Arizona, reporting an increased cut in 1919 as compared with that for 1909, reported a smaller number of mills in 1919. The greatest average cut per mill in 1919 for any one state was 8,380,439 feet in Washington. California was next with 7,970,652 feet and Louisiana third with 6,646,788 feet.

TABLE 19.—PRODUCTION OF LUMBER, BY STATES: 1919, 1914, AND 1909.

STATE.	RANK IN PRODUCTION.			NUMBER OF ACTIVE MILLS REPORTING. <sup>1</sup>		LUMBER SAWED.								
						Quantity (M feet b. m.).			Per cent of increase. <sup>2</sup>		Per cent distribution.			
	1919	1914	1909	1919	1909	1919	1914 <sup>3</sup>	1909	1914-1919	1909-1914	1919	1914	1909	
United States.....				20,534	40,584	34,552,076	37,346,023	44,500,761	-7.5	-16.1	100.0	100.0	100.0	
Washington.....	1	2	1	592	714	4,961,220	3,946,189	3,862,916	25.7	2.2	14.4	10.6	8.7	
Louisiana.....	2	1	2	476	641	3,103,871	3,959,434	3,551,918	-20.0	11.4	9.2	10.6	8.0	
Oregon.....	3	5	9	507	645	2,577,403	1,817,875	1,898,005	41.8	-4.3	7.5	4.9	4.3	
Mississippi.....	4	3	3	1,448	1,761	2,390,135	2,280,876	2,572,669	4.8	-11.3	6.9	6.1	5.8	
Alabama.....	5	8	11	1,926	2,121	1,798,746	1,494,732	1,691,001	20.3	-11.6	5.2	4.0	3.8	
Arkansas.....	6	6	5	1,447	1,958	1,772,157	1,796,780	2,111,300	-1.4	-14.9	5.1	4.8	4.7	
North Carolina.....	7	4	4	3,214	3,249	1,654,435	2,227,715	2,177,715	-25.7	2.3	4.8	6.0	4.9	
Texas.....	8	7	7	444	635	1,379,774	1,554,905	2,099,130	-11.2	-26.0	4.0	4.2	4.7	
California.....	9	12	18	158	273	1,259,368	1,303,183	1,143,507	-3.4	14.0	3.6	3.5	2.6	
Florida.....	10	15	17	425	471	1,137,432	1,076,821	1,201,734	5.9	-10.6	3.3	2.9	2.7	
Wisconsin.....	11	10	8	489	1,205	1,116,338	1,391,001	2,025,038	-19.7	-31.3	3.2	3.7	4.5	
Virginia.....	12	9	6	2,244	3,485	1,098,038	1,488,070	2,101,716	-26.2	-29.2	3.2	4.0	4.7	
Georgia.....	13	10	15	1,772	1,991	893,865	1,026,101	1,342,249	-12.9	-23.5	2.6	2.7	3.0	
Michigan.....	14	13	10	373	1,203	876,891	1,214,435	1,889,724	-27.9	-35.7	2.5	3.2	4.2	
Tennessee.....	15	18	16	1,850	2,631	792,132	885,035	1,223,849	-10.5	-27.7	2.3	2.4	2.7	
Idaho.....	16	20	25	181	290	765,288	763,508	645,800	0.2	18.2	2.2	2.0	1.5	
West Virginia.....	17	14	13	736	1,524	763,103	1,118,480	1,472,942	-31.8	-24.1	2.2	3.0	3.3	
Minnesota.....	18	11	12	355	720	699,639	1,312,230	1,561,508	-46.7	-16.0	2.0	3.5	3.5	
Pennsylvania.....	19	19	14	1,529	2,974	630,471	894,710	1,462,771	-27.1	-40.9	1.8	2.3	3.3	
South Carolina.....	20	21	20	809	998	621,679	701,540	897,660	-11.4	-21.8	1.8	1.9	2.0	
Maine.....	21	17	19	681	1,181	596,116	992,594	1,111,565	-39.9	-10.7	1.7	2.7	2.5	
Kentucky.....	22	22	21	1,222	2,351	512,078	596,392	860,712	-14.1	-30.7	1.5	1.6	1.9	
New York.....	23	23	22	1,236	2,236	357,764	496,195	681,440	-26.4	-28.7	1.0	1.3	1.5	
New Hampshire.....	24	24	24	352	682	338,777	482,744	649,606	-29.8	-25.7	1.0	1.3	1.5	
Missouri.....	25	25	23	790	2,045	321,383	370,571	660,159	-13.3	-43.9	0.9	1.0	1.5	
Montana.....	26	26	30	125	179	287,378	317,842	308,582	-9.6	3.0	0.8	0.9	0.7	
Indiana.....	27	27	26	707	1,599	282,487	298,571	556,418	-5.4	-46.3	0.8	0.8	1.3	
Ohio.....	28	28	27	773	1,028	280,076	286,063	542,904	-2.1	-47.3	0.8	0.8	1.2	
Vermont.....	29	29	29	497	711	218,479	240,608	351,571	-12.5	-29.0	0.6	0.7	0.8	
Oklahoma.....	30	30	32	153	370	168,403	200,594	225,730	-16.0	-11.1	0.5	0.5	0.5	
Massachusetts.....	31	32	28	272	628	166,841	143,094	361,200	16.6	-60.4	0.5	0.4	0.8	
Maryland.....	32	31	31	506	721	113,362	182,097	267,939	-30.1	-39.5	0.3	0.4	0.6	
New Mexico.....	33	37	37	50	80	80,808	97,167	91,987	51.8	-37.9	0.3	0.1	0.2	
Connecticut.....	34	34	34	230	422	86,708	81,833	168,371	5.9	-51.4	0.3	0.2	0.4	
Arizona.....	35	35	38	20	19	73,655	78,667	62,731	-6.4	25.4	0.2	0.2	0.1	
Colorado.....	36	33	35	133	250	64,864	102,117	141,710	-36.5	-27.9	0.2	0.3	0.3	
Illinois.....	37	36	33	252	827	64,628	66,227	170,181	-2.4	-61.1	0.2	0.2	0.4	
South Dakota.....	38	40	41	41	54	42,970	18,744	31,057	129.2	-39.6	0.1	0.1	0.1	
New Jersey.....	39	38	39	102	269	36,888	48,748	61,620	-24.3	-20.9	0.1	0.1	0.1	
Delaware.....	40	39	40	80	151	27,437	25,517	55,440	7.5	-54.0	0.1	0.1	0.1	
Nevada.....	41	( <sup>4</sup> )	( <sup>4</sup> )	3	( <sup>4</sup> )	20,335	( <sup>4</sup> )	( <sup>4</sup> )			0.1			
Iowa.....	42	43	36	85	350	18,493	11,443	132,021	61.6	-91.3	0.1	( <sup>5</sup> )	0.3	
Utah.....	43	44	44	82	88	11,917	8,680	12,638	37.3	-31.3	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	
Rhode Island.....	44	41	43	30	57	11,030	15,902	25,489	-30.6	-37.6	( <sup>5</sup> )	( <sup>5</sup> )	0.1	
Wyoming.....	45	42	42	54	88	8,674	11,852	28,602	-26.8	-58.6	( <sup>5</sup> )	( <sup>5</sup> )	0.1	
All other states <sup>6</sup> .....				11	11	3,345	15,672	15,946	-78.7	-1.7	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )	

<sup>1</sup> The total number of active mills reporting in 1914 was 27,506, not published by states.

<sup>2</sup> A minus sign (-) denotes decrease.

<sup>3</sup> Custom mills and mills cutting less than 50 M feet not included in 1914.

<sup>4</sup> Not published separately.

<sup>5</sup> Less than one-tenth of 1 per cent.

<sup>6</sup> Includes Kansas and Nebraska for 1919, and Kansas, Nebraska, and Nevada for 1914 and 1909.

Production of lumber, by species (Tables 20 to 50).—The cut of lumber, by kinds of wood, is shown in Table 20 for 1919, 1914, and 1909, the species being arranged in order of their rank in production for 1919.

Five species of wood have occupied the same relative position for the three years shown—yellow pine, Douglas fir, oak, hemlock, and lodgepole pine. Western yellow pine advanced from seventh place in 1909 to fourth place in 1919, and white pine dropped from

fourth place in 1909 to sixth place in 1919. These are the two most notable changes in rank. Only six species—Douglas fir, western yellow pine, red gum, white fir, tupelo, and sugar pine—were cut in larger quantities in 1919 than in 1909. Three of these woods—Douglas fir, western yellow pine, and red gum—showed smaller cuts in 1914 than in 1909, and only two woods—white fir and tupelo—showed uninterrupted increases.

TABLE 20.—PRODUCTION OF LUMBER, BY KINDS OF WOOD: 1919, 1914, AND 1909.

KIND OF WOOD.	RANK IN PRODUCTION.			LUMBER SAWED.								
	1919	1914	1909	Quantity (M feet b. m.).			Per cent of increase. <sup>1</sup>		Per cent distribution.			
				1919	1914 <sup>2</sup>	1909	1914-1919	1909-1914	1919	1914	1909	
Total.....				34,552,070	37,340,023	44,500,701	-7.5	-16.1	100.0	100.0	100.0	
Yellow pine.....	1	1	1	13,002,938	14,472,804	10,277,185	-9.7	-11.1	37.8	38.8	36.6	
Douglas fir.....	2	2	2	5,902,169	4,703,693	4,850,378	23.0	-1.9	17.1	12.8	10.9	
Oak.....	3	3	3	2,708,280	3,278,008	4,414,457	-17.4	-25.7	7.8	8.8	9.9	
Western yellow pine.....	4	6	7	1,755,015	1,327,395	1,499,985	32.2	-11.5	5.1	3.6	3.4	
Hemlock.....	5	5	5	1,784,098	2,165,728	3,051,309	-19.0	-29.0	5.1	5.8	6.9	
White pine.....	6	4	4	1,723,042	2,632,587	3,000,034	-34.5	-32.5	5.0	7.0	8.8	
Spruce.....	7	7	6	970,008	1,245,614	1,748,547	-21.3	-28.8	2.8	3.3	3.9	
Maple.....	8	9	8	887,489	909,743	1,106,604	-5.7	-17.8	2.6	2.4	2.6	
Red gum.....	9	10	11	851,431	675,380	706,945	26.1	-4.5	2.5	1.8	1.6	
Cypress.....	10	8	9	680,212	1,013,013	955,635	-35.2	6.0	1.9	2.7	2.1	
Chestnut.....	11	11	12	545,096	540,591	603,891	0.9	-18.6	1.6	1.4	1.5	
Redwood.....	12	12	13	410,442	535,199	521,630	-23.3	2.6	1.2	1.4	1.2	
Larch.....	13	17	16	388,121	358,561	421,214	8.2	-14.9	1.1	1.0	0.9	
Birch.....	14	15	15	375,079	430,067	452,370	-12.0	-4.8	1.1	1.2	1.0	
Beech.....	15	16	14	358,985	376,464	511,244	-4.6	-26.4	1.0	1.0	1.1	
Cedar.....	16	14	19	332,234	490,003	340,008	-33.5	44.5	1.0	1.3	0.8	
Yellow poplar.....	17	13	10	328,538	519,221	858,500	-36.7	-30.5	0.9	1.4	1.9	
White fir.....	18	26	26	223,422	112,027	89,318	98.4	26.1	0.6	0.3	0.2	
Elm.....	19	19	18	194,417	214,394	347,456	-9.3	-38.3	0.6	0.6	0.8	
Basswood.....	20	18	17	183,562	264,656	390,151	-30.6	-33.7	0.5	0.7	0.9	
Hickory.....	21	25	20	170,013	116,113	333,020	46.4	-65.2	0.5	0.3	0.8	
Ash.....	22	21	21	154,931	189,490	201,200	-18.2	-34.9	0.4	0.5	0.7	
Cottonwood.....	23	20	22	144,155	195,198	265,600	-20.1	-26.5	0.4	0.5	0.6	
Tupelo.....	24	24	25	143,730	124,480	96,676	15.5	28.8	0.4	0.3	0.2	
Sugar pine.....	25	22	24	133,658	136,159	97,101	-1.8	40.1	0.4	0.4	0.2	
Balsam fir.....	26	23	23	68,090	125,212	108,702	-45.7	15.2	0.2	0.3	0.2	
Walnut.....	27	27	28	39,218	25,573	46,108	53.4	-44.5	0.1	0.1	0.1	
Sycamore.....	28	28	27	28,114	22,773	50,511	23.5	-59.7	0.1	0.1	0.1	
Lodgepole pine.....	29	29	29	10,281	15,374	25,733	-11.4	-22.6	0.1	0.1	0.1	
All other.....				61,308	55,024	62,151	10.2	-10.5	0.2	0.1	0.1	

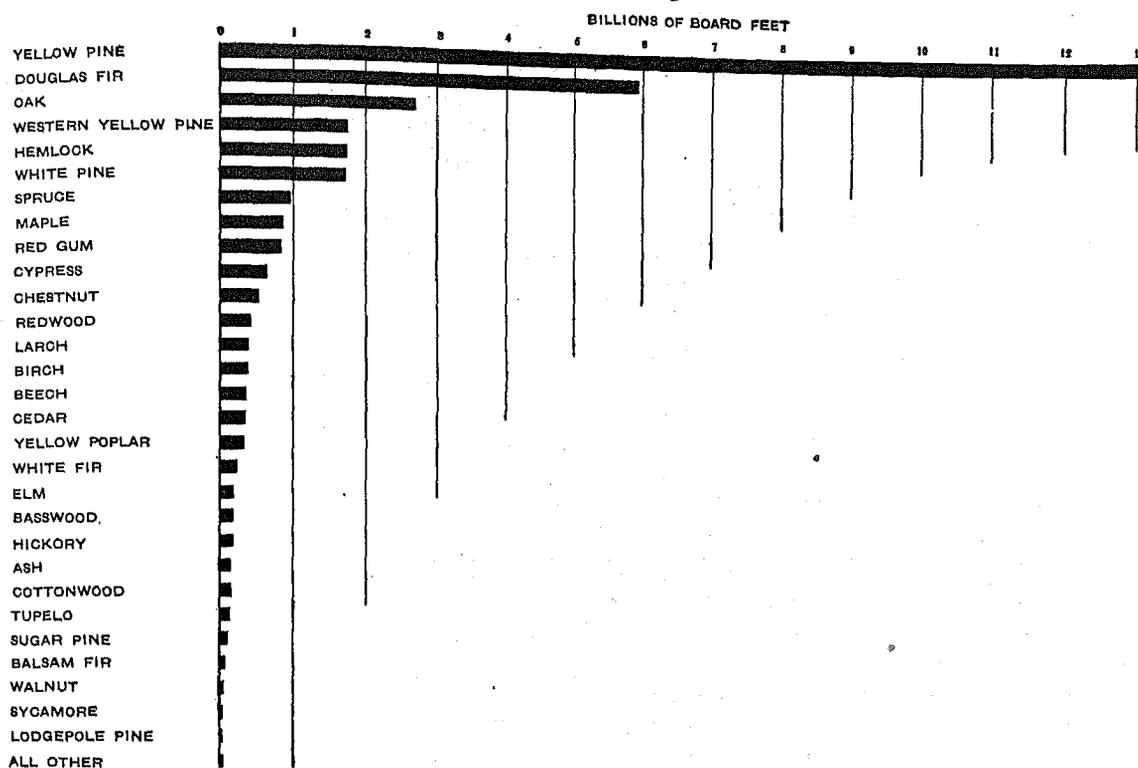
<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Custom mills and mills cutting less than 50,000 feet per year not included in 1914.

In 1919 six species contributed more than 1,000,000,000 feet each of the total lumber cut for that year. The importance of yellow pine is clearly

brought out, this wood alone contributing considerably more than one-third of the total. The lumber cut, by kinds of wood, is shown in the following diagram.

PRODUCTION OF LUMBER, BY KINDS OF WOOD: 1919.



YELLOW PINE.

In Table 21 are presented data pertaining to the lumber cut from the several species of yellow pine growing in the Eastern and Southern states. The three kinds contributing chiefly to the total cut were longleaf, shortleaf, and loblolly pines. The annual output of yellow pine lumber has been greater than that from any other one kind of timber since 1899. Records showing the cut, by kinds of wood, for earlier years are not available. The largest cut, 16,277,185,000 feet, board measure, was reported for the year 1909. Compared with the cut for that year, the production for 1919 decreased 19.7 per cent.

The relative production of yellow pine lumber by the principal producing states has not changed materially during the past few years. In 1918 Mississippi occupied second place, Texas third, and Alabama fourth. In 1919 the order was reversed for Alabama and Texas. In 1899 Georgia was the principal yellow pine lumber-producing state, reporting a total cut of 1,251,266,000 feet, or 11.8 per cent of the total quantity of yellow pine lumber produced in the United States during that year. Statistics for 1904 show Louisiana in the lead, and this state has occupied first place since that time.

The average cut of yellow pine lumber per mill in the United States was 967,052 feet in 1919. The average cut in Louisiana was 6,731,354 feet, the

largest reported by any state. Texas also reported a large average cut, 3,191,209 feet.

The average value at the mill per thousand feet of this lumber has more than doubled in the past four years. The reported average values were \$14.33 in 1916, \$19.00 in 1917, \$24.38 in 1918, and \$28.71 in 1919.

TABLE 21.—PRODUCTION OF YELLOW PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity. (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	13,508	13,062,938	100.0	\$28.71
Louisiana.....	367	2,470,407	18.9	31.49
Mississippi.....	1,269	1,980,395	15.2	29.39
Alabama.....	1,831	1,642,588	12.6	24.37
Texas.....	417	1,330,734	10.2	30.88
North Carolina.....	2,877	1,240,142	9.5	27.56
Arkansas.....	805	1,049,340	8.0	29.61
Florida.....	413	1,004,766	7.7	29.60
Georgia.....	1,753	787,217	5.9	24.54
Virginia.....	1,565	646,834	5.0	26.32
South Carolina.....	808	544,475	4.2	30.22
Oklahoma.....	81	144,412	1.1	28.64
Tennessee.....	550	95,979	0.7	25.43
All other states (see Table 56).....	772	145,649	1.1	27.76

<sup>1</sup> LONGLEAF PINE (*Pinus palustris*); also known as Georgia pine and hard pine and exported as pitch pine; cut mostly in the Gulf states.  
 NORTH CAROLINA PINE (*Pinus taeda*); also called shortleaf, loblolly, old field, rosemary, and Virginia pine; cut mostly in Virginia, North Carolina, South Carolina, Arkansas, and Texas.  
 SHORTLEAF PINE (*Pinus echinata*); cut mostly in Virginia, North Carolina, South Carolina, Arkansas, Missouri, Louisiana, and Mississippi.  
 SAND PINE (*Pinus clausa*); Florida and Alabama.  
 SLASH (OR CUBAN) PINE (*Pinus caribaea*); cut mostly in Georgia and the Gulf states east of the Mississippi River.  
 SCRUB PINE (*Pinus virginiana*), also called JERSEY PINE; cut in the Middle Atlantic states.  
 PITCH PINE (*Pinus rigida*); Middle Atlantic and Northern states.  
 SPRUCE PINE (*Pinus glabra*); Georgia and Gulf states.  
 POND PINE (*Pinus serotina*); South Atlantic states.  
 TABLE-MOUNTAIN PINE (*Pinus pungens*); Appalachian Mountains.

## DOUGLAS FIR.

The stand of Douglas fir timber in the United States is greater than that of any other single kind of wood. This timber is common in the Rocky Mountains and westward to the Pacific coast. Its growing importance in the lumber industry is manifested in these statistics. The lumber cut from this wood in 1919 was the largest for any year for which figures are available and exceeded the output for 1918, the next largest, by 83,028,000 feet, or 1.4 per cent. The relative rank of the principal producing states has remained practically the same for several years, Washington being by far the greatest contributor to the total cut for each year since 1899.

The average cut of Douglas fir lumber per mill in the United States for 1919 was 4,930,801 feet, and the average cut per mill in Washington was 7,863,349 feet. Of the 1,197 mills cutting Douglas fir, 225 cut more than 10,000,000 feet each, 75 cut from 5,000,000 to 10,000,000 feet each, 265 cut from 1,000,000 to 5,000,000 feet each, and 632 mills cut less than 500,000 feet each.

The average value at the mill per thousand feet of Douglas fir lumber for 1916 was \$10.78; for 1917, \$16.28; for 1918, \$18.77; and for 1919, \$24.62.

TABLE 22.—PRODUCTION OF DOUGLAS FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1,197	5,902,160	100.0	\$24.62
Washington.....	493	3,876,031	65.7	24.89
Oregon.....	303	1,795,492	30.4	24.11
California.....	61	141,327	2.4	25.01
Montana.....	17	40,075	0.7	22.00
Idaho.....	103	32,580	0.6	20.97
All other states (see Table 56).....	70	15,464	0.3	24.90

<sup>1</sup> DOUGLAS FIR (*Pseudotsuga taxifolia*) is the principal commercial species.

## OAK.

Under the general head of "Oak" are included all of the many different species of this wood cut into lumber in the United States. Commercially the different varieties are classified as white oak or red oak. The oaks are among the most widely distributed forest trees in the United States and in 1919, 35 states reported lumber cut from these species.

The largest annual cut reported during the past two decades was 4,438,027,000 feet for 1899. This quantity was almost equaled for 1909 when the output was reported as 4,414,457,000 feet.

In 1899 Indiana and Ohio ranked first and second, respectively, in the production of oak lumber. Since that time the principal producing states have been Kentucky, Tennessee, West Virginia, and Arkansas,

each one of which has produced the largest annual cut for one or more of the intervening years. In 1919 these four states contributed nearly 45 per cent of the total cut in the United States.

The average value at the mill per thousand feet of oak lumber for 1916 was \$20.06; for 1917, \$24.49; for 1918, \$31.11; and for 1919, \$37.87.

TABLE 23.—PRODUCTION OF OAK<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	13,064	2,708,280	100.0	\$37.87
Tennessee.....	1,074	349,725	12.9	37.23
Arkansas.....	845	300,523	11.1	39.01
Kentucky.....	1,148	282,063	10.4	35.23
West Virginia.....	684	270,891	10.3	40.02
Virginia.....	1,330	240,707	8.9	31.27
Missouri.....	717	150,031	5.5	30.27
Pennsylvania.....	1,230	145,421	5.4	35.90
North Carolina.....	1,008	130,120	5.0	32.89
Ohio.....	695	133,107	4.9	48.74
Mississippi.....	263	132,804	4.9	43.11
Indiana.....	615	109,583	4.0	54.40
Louisiana.....	127	85,105	3.1	37.24
Alabama.....	472	61,189	2.3	31.85
Illinois.....	243	34,801	1.3	39.78
Georgia.....	305	34,537	1.3	32.40
Maryland.....	365	31,427	1.2	35.91
Texas.....	81	25,605	1.1	30.76
Wisconsin.....	260	25,578	0.9	45.72
New York.....	549	24,051	0.9	42.71
Oklahoma.....	74	19,750	0.7	26.65
Connecticut.....	186	18,727	0.7	35.54
All other states (see Table 56).....	1,027	83,500	3.1	38.96

<sup>1</sup> Commercially the oaks are classed as white and red. The principal commercial oaks are listed below:

WHITE OAKS.—WHITE OAK (*Quercus alba*) is the white oak common throughout the eastern half of the United States; CHESTNUT (or ROCK) OAK (*Quercus prinus*) is found in the Appalachian region; POST OAK (*Quercus minor*) and BUR OAK (*Quercus macrocarpa*) are common throughout the eastern half of the country; OVERCUP OAK (*Quercus lyrata*) and COW (or BASKET) OAK (*Quercus michauxii*) are the principal southern white oaks.

RED OAKS.—RED OAK (*Quercus rubra*) is the red oak common in the eastern part of the United States; TEXAN OAK (*Quercus texana*) is the principal red oak sawed in the lower Mississippi Valley; PIN OAK (*Quercus palustris*) is found in the Eastern and Central states; SCARLET OAK (*Quercus coccinea*) is the northern and northeastern red oak; YELLOW (or BLACK) OAK (*Quercus velutina*) is common in most states east of the Rocky Mountains; WILLOW OAK (*Quercus phellos*) is cut mostly in the Southern states.

## WESTERN YELLOW PINE.

The stand of western yellow pine (*Pinus ponderosa*) is perhaps the third largest in the United States. The importance of this species for lumber has increased considerably since 1899, and the cut reported for 1919 is the second largest annual cut for which records are available, the total production for 1917 being reported as 1,865,282,000 feet, or 110,267,000 feet more than for 1919.

For 1918 and 1919 Oregon reported the largest production. California was the leading state for all previous years for which records are available.

The average cut of western yellow pine lumber per mill in the United States for 1919 was 2,064,724 feet. The average cut per mill in Oregon was 3,559,363 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$14.52; for 1917, \$19.59; for 1918, \$20.87; and for 1919, \$27.75.

TABLE 24.—PRODUCTION OF WESTERN YELLOW PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	850	1,755,015	100.0	\$27.75
Oregon.....	135	480,514	27.4	27.11
California.....	115	444,160	25.3	30.38
Idaho.....	110	255,320	14.5	27.63
Washington.....	139	217,899	12.4	25.79
Montana.....	87	108,548	6.2	22.92
New Mexico.....	49	75,439	4.3	26.83
Arizona.....	20	73,622	4.2	28.40
South Dakota.....	41	42,970	2.4	33.37
Colorado.....	85	32,773	1.9	25.67
All other states (see Table 56).....	69	23,840	1.4	27.63

<sup>1</sup> WESTERN YELLOW PINE (*Pinus ponderosa*) is the one species cut as such.

HEMLOCK.

Four species contribute to the output of hemlock lumber. The most important of these are the common hemlock, which grows in the Northern states from Maine to Wisconsin and southward to the Appalachian region, and western hemlock, reported chiefly by Washington and Oregon.

In 1919, 25 states contributed to the total output of lumber from this wood. For many years Pennsylvania was the leading state in the production of hemlock lumber, reporting a cut of 1,558,188,000 feet in 1899; but in 1908 it was superseded by Wisconsin, which has occupied first place since that time.

The annual cut of hemlock lumber has greatly decreased for the past two decades, because of the depletion of the timber supply in certain sections of the country. The total cut in the United States for 1899 was 3,420,673,000 feet, and the 1919 cut shows a decrease of 1,665,675,000 feet, or 48.7 per cent.

The average value at the mill per thousand feet of hemlock lumber for 1916 was \$15.35; for 1917, \$20.78; for 1918, \$23.97; and for 1919, \$29.16.

TABLE 25.—PRODUCTION OF HEMLOCK<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,653	1,754,998	100.0	\$29.16
Wisconsin.....	260	439,757	25.1	28.78
Washington.....	116	289,854	16.3	22.79
Michigan.....	223	267,824	15.3	30.61
Pennsylvania.....	577	225,155	12.8	34.40
West Virginia.....	121	104,582	6.0	32.62
Maine.....	397	85,542	4.9	29.22
New York.....	891	79,062	4.5	34.48
Oregon.....	33	52,006	3.0	23.15
North Carolina.....	124	48,462	2.8	27.65
Tennessee.....	46	40,221	2.3	30.10
Vermont.....	331	31,554	1.8	30.37
New Hampshire.....	193	31,404	1.8	28.96
Virginia.....	92	28,744	1.6	27.42
Massachusetts.....	115	12,825	0.7	27.65
Kentucky.....	41	10,090	0.6	31.97
All other states (see Table 56).....	93	10,016	0.6	28.70

<sup>1</sup> HEMLOCK (*Tsuga canadensis*) is cut in the Lake states, Northeastern states, and the Appalachian region.  
 WESTERN HEMLOCK (*Tsuga heterophylla*) is found in Washington and Oregon.  
 BLACK (OR WESTERN MOUNTAIN) HEMLOCK (*Tsuga mertensiana*) is cut in small quantities.  
 CAROLINA HEMLOCK (*Tsuga caroliniana*) is occasionally cut in the Appalachian region.

WHITE PINE.

Under this heading are included four distinct species—white pine cut in the Lake states, Appalachian region, and Northeastern states; Norway pine and jack pine cut in the Lake states; and western white pine cut in Idaho, Montana, Washington, and Oregon. These species are well distributed and all the Northern states are represented in the total cut.

The production of white pine lumber has been decreasing for the past two or more decades. The reported cut in 1899 was 7,483,283,000 feet. Of this amount, 5,726,332,000 feet were cut in Michigan, Wisconsin, and Minnesota, the leading three states for that year. The total cut of white pine for 1919 was only 23 per cent as great as the total reported for 1899.

The maximum production of white pine in the Lake states was probably reached in 1890 when the estimated cut was 8,597,623,000 feet. Minnesota was still the leading state in the production of this species in 1919, but Wisconsin and Michigan had dropped to fifth place and eighth place, respectively. The output of white pine in the New England states has remained at about the same level for the past 20 years, the greater part of the cut in these states being second- or third-growth timber.

The average cut per mill of this lumber in the leading three states in 1919 was 2,224,381 feet in Minnesota, 4,983,128 feet in Idaho, and 432,965 feet in Maine. The average cut per mill for the United States was 480,659 feet. The average value at the mill per thousand feet of white pine lumber for 1916 was \$19.16; for 1917, \$24.81; for 1918, \$30.84; and for 1919, \$32.83.

TABLE 26.—PRODUCTION OF WHITE PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,586	1,723,642	100.0	\$32.83
Minnesota.....	252	560,544	32.5	31.23
Idaho.....	47	234,207	13.6	35.99
Maine.....	517	223,843	13.0	31.50
New Hampshire.....	307	176,012	10.2	29.02
Wisconsin.....	264	125,959	7.3	39.02
Massachusetts.....	228	104,200	6.0	28.17
Washington.....	33	63,214	3.7	31.37
Michigan.....	172	57,501	3.3	41.34
New York.....	527	49,220	2.9	39.42
Pennsylvania.....	591	44,213	2.6	37.50
Vermont.....	195	30,344	1.8	32.15
All other states (see Table 56).....	453	54,385	3.2	31.85

<sup>1</sup> WHITE PINE (*Pinus strobus*) is the white pine cut in the Lake states, the Northeastern states, and the Appalachian region.  
 NORWAY (OR RED) PINE (*Pinus resinosa*), though botanically a yellow pine, is cut in the Lake states and largely marketed with white pine.  
 JACK PINE (*Pinus banksiana*) is cut in the Lake states.  
 WESTERN WHITE PINE (*Pinus monticola*) is cut in Idaho, Montana, Washington, and Oregon.

SPRUCE.

Several species are included in the statistics of spruce lumber. The most important are the red

spruce of the Northeastern states and the Appalachian Mountain ranges as far south as northern Georgia, and the Sitka spruce of the west coast.

The lumber production has been substantially the same for the past three years. In 1917 the annual cut from this species fell below one billion feet for the first time since 1899. The largest annual cut of record was 1,748,547,000 feet for 1909.

The heavy demand on this timber for pulp has materially affected the cut of lumber, not only on account of the depletion of the supply but also because the high prices of pulp wood prevailing at this period made it more profitable to cut spruce for pulp than for lumber, particularly as small sizes and poor grades can be utilized by the pulp mills.

Until 1918 Maine was the leading spruce lumber-producing state for all years for which records are available. In that year it dropped to third place, while Washington advanced to first place and Oregon to second. In 1919 Washington was still the leading state, but Maine occupied second place and Oregon third. These three states together furnished nearly 62 per cent of the total cut of spruce lumber for 1919. The average cut of spruce per mill in the United States was 605,292 feet. The average cut per mill in Washington was 3,695,887 feet.

The average value at the mill per thousand feet of spruce lumber for 1916 was \$17.58; for 1917, \$24.41; for 1918, \$28.65; and for 1919, \$30.76.

TABLE 27.—PRODUCTION OF SPRUCE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1, 819	979, 068	100.0	\$30.76
Washington.....	62	229, 145	23.4	24.69
Maine.....	305	203, 645	21.3	34.93
Oregon.....	31	169, 059	10.9	25.00
New Hampshire.....	128	75, 811	7.7	38.92
Vermont.....	370	68, 059	5.0	33.69
West Virginia.....	17	50, 414	5.1	39.10
North Carolina.....	69	42, 976	4.4	32.57
Montana.....	20	34, 064	3.5	25.24
New York.....	132	29, 341	3.0	40.64
Minnesota.....	79	29, 293	3.0	31.61
Colorado.....	55	18, 018	1.6	28.61
Wisconsin.....	46	10, 046	1.1	32.20
Michigan.....	58	8, 417	0.9	36.36
All other states (see Table 56).....	137	21, 078	2.2	31.62

<sup>1</sup> RED SPRUCE (*Picea rubens*) is the principal species cut in the Northeastern states and the Appalachian region.

SITKA SPRUCE (*Picea sitchensis*) is the principal species cut in Oregon and Washington.

BLACK SPRUCE (*Picea mariana*) is cut in limited quantities in the Northeastern states.

WHITE SPRUCE (*Picea canadensis*) is cut in the Lake states, New York, and northern New England.

ENGELMANN SPRUCE (*Picea engelmanni*) is cut in the Rocky Mountain region.

#### MAPLE.

Maple is well distributed, and all principal timber regions of the United States, including the southern yellow pine group and the western Rocky Mountain group, are represented in Table 28. Sugar maple or hard maple is the most common and most valuable of the several species of maple cut into lumber. This tree reaches its greatest development in the Northern

states, and while it grows as far south as Florida and Texas, it is not abundant in the South. The most important maple lumber-producing state is Michigan, and in 1919 this state contributed 37.5 per cent of the total cut for the United States.

The largest cut of record was 1,106,604,000 feet reported for 1909. The cut for 1919, compared with that for 1909, shows a decrease of 22.5 per cent. The average cut of maple lumber per mill in the United States for 1919 was 187,102 feet. The average cut per mill in Michigan was 1,260,427 feet.

In common with all other woods, the price per thousand feet at the mill for maple has increased, the average values for the past four years being reported as follows: 1916, \$18.24; 1917, \$23.16; 1918, \$29.05; and 1919, \$35.56.

TABLE 28.—PRODUCTION OF MAPLE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	4, 583	857, 489	100.0	\$35.56
Michigan.....	255	321, 409	37.5	35.97
Wisconsin.....	300	177, 125	20.7	33.10
West Virginia.....	226	58, 242	6.8	38.36
New York.....	724	50, 834	6.6	38.41
Pennsylvania.....	598	48, 610	5.7	35.39
Ohio.....	445	34, 787	4.1	35.54
Indiana.....	413	33, 396	3.9	45.17
Vermont.....	340	33, 289	3.9	33.34
North Carolina.....	125	11, 977	1.4	31.44
New Hampshire.....	96	9, 562	1.1	34.06
All other states (see Table 56).....	1, 064	72, 298	8.4	32.96

<sup>1</sup> SUGAR (or HARD) MAPLE (*Acer saccharum*) is cut principally in the Northern states.

SILVER (or SOFT) MAPLE (*Acer saccharinum*) is also cut in the Northern states.

RED (or SOFT) MAPLE (*Acer rubrum*) is the principal species cut in the Southern states.

OREGON MAPLE (*Acer macrophyllum*) is cut in the Pacific Coast states.

#### RED GUM.

Red gum is a southern tree and is not abundant north of the Ohio River. It is of growing importance in the lumber industry and in 1919 ranked ninth among the species in the production of lumber. In 1914 it ranked tenth and in 1909, eleventh.

The reported lumber cut of red gum for 1919 in the United States was greater than that for any other year for which figures are available, the next largest annual cut, 772,514,000 feet, being reported for 1913. In 1919 this wood was used in greater quantities than any other in the manufacture of veneers and slack cooperage staves.

Arkansas has led in the production of this lumber for all years of record since 1899. Mississippi, Louisiana, and Tennessee, in the order named, have been next in importance for the past several years. In 1919 Arkansas, Mississippi, and Louisiana reported 65 per cent of the total quantity cut.

The average value at the mill per thousand feet of red gum, like that for all other species, has increased rapidly for the past four years, and was reported as follows: \$14.64 for 1916, \$19.56 for 1917, \$23.21 for 1918, and \$32.68 for 1919.

TABLE 29.—PRODUCTION OF RED-GUM<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,684	851,431	100.0	\$32.68
Arkansas.....	476	238,327	28.0	34.54
Mississippi.....	190	168,226	19.8	34.56
Louisiana.....	113	147,260	17.3	33.64
Tennessee.....	406	80,025	9.4	33.82
Alabama.....	171	39,349	4.6	25.30
Kentucky.....	301	31,692	3.7	25.17
Missouri.....	73	31,105	3.7	32.80
South Carolina.....	33	21,917	2.6	30.58
North Carolina.....	145	21,507	2.5	29.57
Virginia.....	100	16,888	2.0	22.61
Georgia.....	30	15,510	1.8	31.37
Texas.....	41	11,924	1.4	24.58
All other states (see Table 56).....	605	27,701	3.3	30.13

<sup>1</sup> RED (OR SWEET) GUM (*Liquidambar styraciflua*) is the only species that goes into red-gum lumber. Commercial sap gum is the sapwood of the red gum.

CYPRESS.

Cypress grows in low regions subject to inundation in the southern and eastern part of the United States. It has long been important as lumber and for several years the annual cut reported exceeded 1,000,000,000 feet. Since 1915 the cut has decreased and the output in 1918, 578,026,000 feet, was the smallest since 1899. The cut in 1919 exceeded that of 1918 by 78,186,000 feet, or 13.5 per cent.

Louisiana has been the leading state in the production of lumber from this wood for all years for which records are available and for several years contributed one-half or more of the total production in the United States. Florida, the next state in importance, contributed 18.4 per cent of the total cut in 1919.

The average cut of cypress lumber per mill in the United States for 1919 was 972,166 feet. In Louisiana the average cut per mill was 3,112,515 feet. The average value at the mill per thousand feet of cypress lumber for 1916 was \$20.85; for 1917, \$23.92; for 1918, \$30.56; and for 1919, \$38.38.

TABLE 30.—PRODUCTION OF CYPRESS<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	675	656,212	100.0	\$38.38
Louisiana.....	99	308,139	47.0	40.54
Florida.....	36	120,433	18.4	37.26
Georgia.....	35	43,440	6.6	41.85
Arkansas.....	163	43,335	6.6	34.44
Missouri.....	48	41,466	6.3	33.27
South Carolina.....	37	27,482	4.2	35.68
North Carolina.....	74	17,468	2.7	30.88
Mississippi.....	67	17,201	2.6	35.85
Alabama.....	23	13,776	2.1	37.00
All other states (see Table 56).....	103	28,382	3.6	33.58

<sup>1</sup> BALD CYPRESS (*Taxodium distichum*) is the one species cut as such.

CHESTNUT.

The cut of chestnut lumber for 1919 increased more than 200,000,000 feet, or 58.2 per cent, compared with the cut for 1918 which was the smallest since 1905.

The greatest production reported for any one year of this kind of lumber was 663,891,000 feet in 1909.

Doubtless the chestnut blight has greatly affected the cut of lumber from this species. In order to save the timber from being a total loss, it has been singled out and cut in preference to other timber.

Pennsylvania, prior to 1909, was for several years the leader in the production of chestnut lumber. Since that time, however, this state has been out-ranked by West Virginia.

The average value at the mill per thousand feet of chestnut lumber for 1916 was \$17.05; for 1917, \$21.54; for 1918, \$27.31; and for 1919, \$32.30.

TABLE 31.—PRODUCTION OF CHESTNUT<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	4,244	545,636	100.0	\$32.30
West Virginia.....	325	118,087	21.6	35.01
Pennsylvania.....	1,052	85,777	15.7	31.13
North Carolina.....	367	63,507	12.7	31.57
Virginia.....	446	63,458	12.7	31.04
Connecticut.....	221	44,644	8.2	31.09
Tennessee.....	317	33,511	7.2	32.13
Massachusetts.....	141	30,222	5.5	28.96
Kentucky.....	331	24,850	4.6	31.68
New York.....	391	14,863	2.7	34.33
Maryland.....	199	14,287	2.6	30.63
Ohio.....	165	11,840	2.2	41.62
All other states (see Table 56).....	229	22,650	4.2	31.43

<sup>1</sup> CHESTNUT (*Castanea dentata*) is the only species included in chestnut lumber.

REDWOOD.

Redwood lumber was reported exclusively from California. It is cut chiefly from the coast redwood, which grows in a narrow belt along the coast north of San Francisco, and the bigtree, which is confined to a limited region on the western slope of the Sierras. Owing to the extremely large size of the trees and the rough character of much of the ground on which they stand, the logging and manufacturing of redwood is one of the most difficult and expensive lumbering operations in the United States. Comparatively few mills are engaged in the industry, but their output is relatively large. The average cut per mill in 1919 was 12,437,636 feet, which was greater than that for any other species. The production since 1899 for all years for which records are available has been fairly constant, the largest cut being 659,678,000 feet in 1906. The average value at the mill per thousand feet of redwood lumber for 1916 was \$13.93; for 1917, \$21.00; for 1918, \$24.30; and for 1919, \$30.04.

TABLE 32.—PRODUCTION OF REDWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	33	410,442	100.0	\$30.04
California.....	33	410,442	100.0	30.04

<sup>1</sup> REDWOOD (*Sequoia sempervirens*) is the species chiefly cut; BIGTREE (*Sequoia washingtoniana*) furnishes a minor part of the redwood production.

## LARCH.

Two species, tamarack or larch of the Eastern and Northern states and western larch of the Rocky Mountain region and the west coast, contribute to the total cut of larch lumber. The western species supplied about 85 per cent of the total cut in 1919.

The production of lumber from this species has been fairly constant since 1907, the largest cut, 421,214,000 feet, being reported for 1909. Of this amount, Montana, Idaho, Washington, and Oregon contributed 62.7 per cent. The cut of lumber from this wood in the Lake states—Michigan, Minnesota, and Wisconsin—has been decreasing rapidly, and the 1919 output was only a little more than one-third as large as that for 1909, which was reported as 155,430,000 feet.

Montana and Idaho have been the leading two states for several years, Idaho occupying first place in 1918 and 1919. In 1919 these two states contributed 63.1 per cent of the total cut of larch lumber in the United States.

The average cut of larch lumber per mill in the United States for 1919 was 831,094 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$12.49; for 1917, \$16.21; for 1918, \$19.86; and for 1919, \$23.39.

TABLE 33.—PRODUCTION OF LARCH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	467	358,121	100.0	\$23.39
Idaho.....	50	143,055	39.9	22.15
Montana.....	42	101,714	28.2	22.61
Washington.....	67	63,870	16.5	21.70
Minnesota.....	110	35,765	9.2	23.48
Oregon.....	12	18,988	4.9	23.84
Wisconsin.....	94	14,733	3.8	20.71
All other states (see Table 56).....	92	10,016	2.6	31.60

<sup>1</sup> WESTERN LARCH (*Larix occidentalis*) is the species cut in the inland empire and the Pacific northwest.  
TAMARACK, OR LARCH (*Larix laricina*), is cut in the Lake states and New England states.

## BIRCH.

Several species of birch contributed to the lumber output, but two furnished most of the market supply. These are the yellow birch of the Lake states, New York, and New England and the sweet birch cut in Pennsylvania and southward. The wood of the two species is very similar.

A considerable quantity of birch is sawed directly into bars for spools and a variety of other small turned articles known to the trade as novelties. The wood takes a fine finish and is used extensively for furniture and interior finish. This wood is also used extensively in the manufacture of veneers, ranking third in quantity among the various woods used for that purpose in 1919.

Wisconsin has reported the largest cut of birch lumber for each year for which records are available since 1899, except in 1904, when Michigan led and

Wisconsin occupied second place. For the past several years Michigan has ranked second. The largest annual output for all states was 452,370,000 feet reported for 1909. Of this amount, Wisconsin furnished nearly 40 per cent. In 1919 the cut of these two states supplied 63.5 per cent of the total output for the United States, although 25 other states are represented in the statistics.

The average value at the mill per thousand feet of birch lumber for 1916 was \$19.59; for 1917, \$24.07; for 1918, \$29.94; and for 1919, \$35.79.

TABLE 34.—PRODUCTION OF BIRCH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1,922	375,079	100.0	\$35.79
Wisconsin.....	213	174,873	46.8	35.70
Michigan.....	141	63,533	16.9	39.29
New York.....	293	20,710	7.0	39.71
Vermont.....	328	26,394	7.0	33.31
Maine.....	131	21,533	5.7	33.77
New Hampshire.....	111	12,229	3.3	32.54
Pennsylvania.....	233	10,541	2.8	33.45
Minnesota.....	61	9,089	2.7	25.12
All other states (see Table 56).....	391	26,271	7.0	34.13

<sup>1</sup> YELLOW BIRCH (*Betula lutea*) is the principal species cut in the Lake states, New England, and New York.

PAPER BIRCH (*Betula papyrifera*) and WHITE (OR GRAY) BIRCH (*Betula populifolia*) are also cut to a limited extent in New England.

SWEET (OR CHERRY) BIRCH (*Betula lenta*) is cut in West Virginia and Pennsylvania.

RIVER (OR RED) BIRCH (*Betula nigra*) is cut in the Southern states.

## BEECH.

The production of beech lumber in 1919 was reported by 23 states, all of which are east of the Rocky Mountains. The total output reported for 1919 increased 40.6 per cent compared with the cut reported for 1918, but decreased 29.8 per cent compared with that for 1909, which was the largest of record.

For all years for which records are available from 1905 to 1918, inclusive, Michigan led in the production of this lumber. In 1919, however, Indiana reported a larger production and Michigan dropped to second place.

The average value at the mill per thousand feet of beech lumber for 1916 was \$16.20; for 1917, \$19.58; for 1918, \$25.06; and for 1919, \$29.98.

TABLE 35.—PRODUCTION OF BEECH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,761	358,985	100.0	\$29.98
Indiana.....	498	67,107	15.9	31.54
Michigan.....	102	49,125	13.7	31.21
Pennsylvania.....	394	30,247	10.9	30.03
New York.....	672	38,463	10.7	30.73
Ohio.....	403	37,907	10.6	28.85
Kentucky.....	457	37,459	10.4	25.38
West Virginia.....	237	30,073	8.4	33.04
Vermont.....	225	14,572	4.1	31.32
Tennessee.....	283	14,200	4.0	29.86
All other states (see Table 56).....	410	40,742	11.3	28.12

<sup>1</sup> BEECH (*Fagus atropurpurea*) is the only species that goes into beech lumber.

CEDAR.

Of the many species classed as cedar in the reports of the sawmill industry, the most important is the western red cedar, ranging from Idaho to the Pacific coast. Other important western species are yellow cedar, Port Orford cedar, and incense cedar, the last mentioned being found in the Sierra Nevada Mountains of California and southern Oregon.

The most important of the eastern cedars represented in the lumber statistics is red cedar, which grows from Maine to South Dakota and southward to Texas and Florida, although the commercial production is limited to Tennessee, Florida, and Alabama. It is in great demand for lead pencils.

The production of lumber does not represent the only drain on the cedar timber, since a large quantity of this wood is consumed in the manufacture of shingles, poles, posts, and ties. The greatest production of cedar lumber for any one year for which records are available was in 1914, the cut for that year being reported as 499,903,000 feet. Washington has been the greatest producer, furnishing in 1919 more than three-fifths of the total output in the United States.

The average cut per mill of cedar lumber in the United States for 1919 was 600,785 feet. In Washington the average cut per mill was 2,667,442 feet. The average value at the mill per thousand feet of cedar lumber for 1916 was \$15.24; for 1917, \$19.40; for 1918, \$24.86; and for 1919, \$33.80.

TABLE 36.—PRODUCTION OF CEDAR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	553	332,284	100.0	\$33.80
Washington.....	77	205,393	61.8	31.74
Oregon.....	32	32,763	9.9	31.67
Idaho.....	21	26,165	7.9	28.55
California.....	37	20,496	6.1	23.50
Tennessee.....	107	14,708	4.4	71.27
Maine.....	71	7,445	2.2	32.57
New Jersey.....	20	5,010	1.5	46.35
North Carolina.....	19	4,136	1.2	65.73
Michigan.....	34	4,014	1.2	30.06
Kentucky.....	10	2,513	0.8	71.95
All other states (see Table 56).....	116	9,681	2.9	36.11

<sup>1</sup> WESTERN RED CEDAR (*Thuja plicata*) is cut in Washington, Oregon, and Idaho. PORT ORFORD CEDAR (*Chamaecyparis lawsoniana*) is cut in Oregon. ALASKA OR YELLOW CEDAR (*Chamaecyparis Nootkatensis*) is cut in Washington. INCENSE CEDAR (*Libocedrus decurrens*) is cut in California. NORTHERN WHITE CEDAR (OR ARBORVITÆ) (*Thuja occidentalis*) is cut in the Lake states and the Northeastern states. SOUTHERN WHITE CEDAR (OR "JUNIPER") (*Chamaecyparis thyoides*) is cut in the Atlantic Coast states. RED CEDAR (*Juniperus virginiana*) and SOUTHERN RED JUNIPER (*Juniperus barbadensis*) are cut principally in Tennessee, Florida, and Alabama.

YELLOW POPLAR.

Yellow poplar, or tulip poplar, lumber is cut from only one species. This tree grows principally in the Appalachian Mountain region and is not found in solid stands but is mixed in with other hardwoods. The principal producing states are West Virginia, Tennessee, Kentucky, Virginia, and North Carolina,

although 23 other states reported yellow poplar lumber in 1919.

West Virginia has been the leading state for a number of years and in 1919 furnished nearly one-fifth of the total cut of the United States. The greatest cut for any one year for which figures are available was 862,849,000 feet for 1907. Of this amount, Kentucky reported 23.9 per cent.

The average value at the mill per thousand feet of yellow poplar lumber for 1916 was \$21.89; for 1917, \$27.17; for 1918, \$35.06; and for 1919, \$41.65.

TABLE 37.—PRODUCTION OF YELLOW POPLAR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,278	328,538	100.0	\$41.65
West Virginia.....	305	63,827	19.4	45.68
Tennessee.....	569	53,492	16.3	42.14
Kentucky.....	458	50,462	15.4	40.93
Virginia.....	429	44,205	13.5	39.03
North Carolina.....	283	25,298	7.7	37.14
Alabama.....	177	20,998	6.4	35.26
Georgia.....	78	18,575	5.7	39.77
Ohio.....	198	12,260	3.7	50.46
All other states (see Table 56).....	771	39,412	12.0	42.76

<sup>1</sup> YELLOW POPLAR (*Liriodendron tulipifera*) is the only species that goes into poplar lumber.

WHITE FIR.

The species sold as white fir are all western, and include, besides the true white fir (*Abies concolor*), several species cut in the Rocky Mountains and west coast regions of the United States.

Of the 10 States contributing to the total cut of white fir lumber in 1919, California was the principal producer, reporting 48.5 per cent of the total for the United States. Prior to 1905, the cut from this species was not reported separately, and the figures for 1919 show a larger production than any previous year of record.

The average cut of white fir lumber per mill in the United States for 1919 was 1,460,275 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$12.25; for 1917, \$17.16; for 1918, \$19.61; and for 1919, \$25.66.

TABLE 38.—PRODUCTION OF WHITE FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	153	223,422	100.0	\$25.66
California.....	49	108,374	48.5	27.50
Idaho.....	27	65,404	29.3	25.09
Oregon.....	20	22,731	10.2	23.53
Washington.....	23	17,979	8.0	19.66
All other states (see Table 56).....	34	8,934	4.0	24.93

<sup>1</sup> WHITE FIR (*Abies concolor*) is cut only in the West. Marketed as white fir are:

- GRAND FIR (*Abies grandis*), cut mostly in Idaho and Montana.
- SILVER FIR (*Abies amabilis*), cut chiefly in Washington.
- RED FIR (*Abies magnifica*), cut chiefly in California.
- ALPINE FIR (*Abies lasiocarpa*), cut chiefly in the northern Rocky Mountain and Cascade Mountain regions.

## ELM.

White elm is by far the most important of the many varieties of elm that enter into the statistics of the production of lumber. Elm grows in practically every state east of the Rocky Mountains, and lumber sawed from this wood was reported by 34 states for 1919. The timber is being depleted, however, and this is reflected in the production figures which show a large decrease for the past 20 years. In 1899 the total cut of elm lumber was 456,731,000 feet, which has not been equaled since that time.

Wisconsin and Michigan have been the leading states for the past several years, and in 1919 these two states, together with Indiana, produced 52.9 per cent of the total cut.

This is an important wood in the production of slack cooperage stock, and large quantities are used in the manufacture of staves, heading, and hoops each year.

The average value at the mill per thousand feet of elm lumber for 1916 was \$19.46; for 1917, \$23.89; for 1918, \$28.19; and for 1919, \$36.39.

TABLE 39.—PRODUCTION OF ELM<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,600	194,417	100.0	\$36.39
Wisconsin.....	242	51,242	26.4	36.79
Michigan.....	191	30,745	15.8	40.11
Indiana.....	333	20,333	10.7	41.77
Arkansas.....	113	13,742	9.6	35.95
Ohio.....	301	12,405	6.4	35.25
Tennessee.....	188	10,755	5.5	37.70
Missouri.....	192	10,236	5.3	30.86
Mississippi.....	53	7,778	4.0	36.76
Minnesota.....	90	5,831	3.0	26.89
New York.....	346	5,710	2.9	32.64
Louisiana.....	40	5,188	2.7	31.12
Illinois.....	97	4,762	2.4	33.77
All other states (see Table 56).....	414	10,190	5.2	30.11

<sup>1</sup> WHITE (or SOFT) ELM (*Ulmus americana*) is cut in all of the states east of the Rocky Mountains.

SNIPPERY (or RED, or SOFT) ELM (*Ulmus pubescens*) is cut in the same region as white elm.

CORK (or TRUE ROCK) ELM (*Ulmus racemosa*) is cut in the Lake states.

WING ELM (*Ulmus alata*) and CEDAR ELM (*Ulmus crassifolia*) are occasionally cut in the lower Mississippi Valley.

## BASSWOOD.

The basswood, or linn, which is most abundant in the Lake states, and the white basswood of the Appalachian Mountain region are the most important species cut into lumber. These woods are very similar and usually no distinction is made by the trade.

The leading states in the production of basswood lumber for the past 20 years have been Wisconsin and Michigan. In 1919 these two states reported 56.2 per cent of the total cut for the United States. The largest annual cut reported since 1899 was 399,151,000 feet in 1909. Of this amount, Wisconsin furnished one-third.

The average value at the mill per thousand feet of basswood lumber for 1916 was \$21.05; for 1917, \$25.96; for 1918, \$34.00; and for 1919, \$40.03.

TABLE 40.—PRODUCTION OF BASSWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,202	183,592	100.0	\$40.03
Wisconsin.....	251	69,545	37.9	39.78
Michigan.....	153	33,532	18.3	42.38
West Virginia.....	137	15,296	8.3	40.88
New York.....	532	10,983	6.0	40.38
Virginia.....	50	7,591	4.1	37.54
Ohio.....	141	7,363	4.0	49.17
All other states (see Table 56).....	927	39,252	21.4	36.81

<sup>1</sup> BASSWOOD (or LINN) (*Tilia americana*) is cut principally in the Lake states. WHITE BASSWOOD (*Tilia heterophylla*) is cut in the Appalachian Mountain region. DOWNY BASSWOOD (*Tilia pubescens*) is cut in limited quantity in the Southern states.

## HICKORY.

Hickory is well distributed throughout the Mississippi Valley and the eastern part of the United States. It does not grow in pure stands but is scattered through other hardwood forests.

Indiana, Arkansas, and Tennessee have at different times since 1899 led in the production of lumber from hickory, and for the past four years Arkansas has been the leading state. The production of lumber from this wood was reported by 29 states for 1919. Arkansas, Tennessee, and Kentucky, however, furnished 52.6 per cent of the total output.

A large quantity of hewn and split hickory stock goes directly into vehicle stock, tool handles, etc., and is therefore not included in the statistics of the lumber cut.

The average value at the mill per thousand feet of hickory lumber for 1916 was \$23.84; for 1917, \$29.48; for 1918, \$37.95; and for 1919, \$44.37.

TABLE 41.—PRODUCTION OF HICKORY<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,046	170,013	100.0	\$44.37
Arkansas.....	241	42,288	24.9	44.11
Tennessee.....	299	28,235	16.6	46.91
Kentucky.....	272	18,028	11.1	41.57
West Virginia.....	228	11,035	6.8	37.97
Indiana.....	330	11,594	6.8	51.79
Mississippi.....	59	11,265	6.6	45.73
Ohio.....	319	9,006	5.7	46.27
Louisiana.....	33	6,206	3.7	52.81
North Carolina.....	67	5,561	3.3	34.23
Pennsylvania.....	133	4,050	2.7	35.79
Alabama.....	60	4,452	2.6	45.79
All other states (see Table 56).....	555	15,593	9.2	43.46

<sup>1</sup> Several species of hickory are cut, the principal ones being SHAGBARK (*Hicoria ovata*), SHELLBARK (*Hicoria laetiflora*), PIGNUT (*Hicoria glabra*), BITTERNUT (*Hicoria nitida*), and MOCKERNUT (*Hicoria alba*).

ASH.

Ash timber grows scattered in with other woods and is not found in solid stands. Many varieties grow in the United States, the principal lumber-producing species being the white ash, black ash, and green ash.

In 1919, 36 states reported the production of ash lumber. For many years Michigan was the chief producer, but during the past several years Arkansas and Louisiana have been the leading states.

The largest production of record during the past 20 years was 291,209,000 feet in 1909. Large quantities of ash are consumed in the manufacture of cooperage stock, both tight and slack, which do not figure in the lumber production.

The average value at the mill per thousand feet of ash lumber for 1916 was \$23.85; for 1917, \$30.01; for 1918, \$38.70; and for 1919, \$52.69.

TABLE 42.—PRODUCTION OF ASH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,502	154,931	100.0	\$52.69
Arkansas.....	125	23,642	15.3	54.55
Louisiana.....	67	19,826	12.8	52.82
Indiana.....	239	14,619	9.4	74.10
Wisconsin.....	141	14,046	9.1	36.42
Tennessee.....	155	14,008	9.0	66.37
Mississippi.....	63	10,258	6.6	55.75
Ohio.....	248	8,332	5.4	61.52
Michigan.....	125	6,611	4.3	39.52
New York.....	395	5,106	3.3	43.30
Kentucky.....	90	4,870	3.1	42.16
West Virginia.....	85	4,052	2.6	55.47
Pennsylvania.....	209	3,798	2.5	45.60
Georgia.....	16	3,656	2.4	63.02
Missouri.....	52	3,484	2.2	47.07
All other states (see Table 56).....	546	18,623	12.0	39.59

<sup>1</sup> Lumber trade practice specifies white ash and brown ash. The former is cut from the white ash tree and the latter from the black ash tree.  
 WHITE ASH (*Fraxinus americana*) is cut principally in the Central states.  
 GREEN ASH (*Fraxinus lanceolata*) is cut principally in the Southern states.  
 BLACK ASH (*Fraxinus nigra*) is cut in the Lake states and Northeastern states.  
 RED ASH (*Fraxinus pennsylvanica*) is cut in limited quantity in the Eastern states.  
 OREGON ASH (*Fraxinus oregona*) is cut in the Pacific northwest.

COTTONWOOD.

The different species included under the common name "cottonwood" are widely distributed and the production of lumber from these species was reported by 37 states for 1919. Mississippi and Arkansas have been the leading states since 1899, and Missouri, Louisiana, and Minnesota, also, have been important producers of lumber from this wood during the two decades. The largest annual cut of cottonwood lumber reported during this period was 415,124,000 feet for 1899. Since that time the annual output has been decreasing.

Large quantities of cottonwood, particularly the aspen or popple, are cut for pulpwood, and no doubt this has considerable influence on the lumber output.

The average value at the mill per thousand feet of cottonwood lumber for 1916 was \$17.42; for 1917, \$23.19; for 1918, \$26.13; and for 1919, \$32.24.

TABLE 43.—PRODUCTION OF COTTONWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	787	144,155	100.0	\$32.24
Mississippi.....	41	37,094	25.7	30.16
Minnesota.....	110	30,135	20.9	23.45
Arkansas.....	66	26,426	18.3	39.02
Missouri.....	74	11,130	7.7	37.14
Louisiana.....	29	8,421	5.8	36.64
Tennessee.....	22	6,552	4.5	38.11
Iowa.....	50	4,797	3.3	43.91
Michigan.....	41	4,313	3.0	34.62
Oklahoma.....	13	1,761	1.2	22.80
Illinois.....	39	1,565	1.1	33.95
Indiana.....	70	1,372	1.0	33.00
Florida.....	3	1,370	1.0	36.41
Oregon.....	2	1,265	0.9	15.25
Wisconsin.....	43	1,197	0.8	33.55
All other states (see Table 56).....	184	6,757	4.7	31.25

<sup>1</sup> COMMON COTTONWOOD (*Populus deltoides*) is the species most commonly cut east of the Rocky Mountains and more particularly in the lower Mississippi Valley.  
 SWAMP COTTONWOOD (*Populus heterophylla*) is cut in the Mississippi Valley states.  
 ASPEN (or POPPLE) (*Populus tremuloides*) is cut in the Lake states and the Northeastern states, and to a limited extent in the Rocky Mountains and farther west.  
 LARGE-TOOTHED ASPEN (*Populus grandidentata*) is cut in the Lake states and Northeastern states.  
 BALM OF GILEAD (*Populus balsamifera*) is cut in the Lake states and Eastern states.  
 BLACK COTTONWOOD (*Populus trichocarpa*) is cut in the Pacific Coast states.

TUPELO.

Several species are included under the heading "Tupelo" in these statistics. The most important contributor to the supply of tupelo lumber is the true tupelo (*Nyssa aquatica*), a large tree growing in flat, swampy lands in the Southern and Gulf states. Black gum, which is found in the same section and farther north, also contributes a considerable proportion to the total.

The production of tupelo lumber was shown separately for the first time for 1905, and the greatest annual production of record was 249,992,000 feet, reported for 1917. Louisiana has been the chief producer of tupelo lumber for several years, and for 1919 reported more than three-fifths of the total cut.

A considerable quantity of tupelo is used in the manufacture of veneers, which does not enter into the production figures for lumber.

The average value at the mill per thousand feet of tupelo lumber for 1916 was \$13.00; for 1917 \$18.06; for 1918, \$22.73; and for 1919, \$28.42.

TABLE 44.—PRODUCTION OF TUPELO<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	469	143,730	100.0	\$28.42
Louisiana.....	61	87,634	61.0	27.21
North Carolina.....	42	11,469	8.0	28.37
Arkansas.....	48	9,056	6.3	33.06
South Carolina.....	11	6,893	4.8	34.56
Mississippi.....	33	6,522	4.5	26.75
Alabama.....	14	4,975	3.5	32.82
Missouri.....	23	3,962	2.8	27.79
Tennessee.....	62	3,310	2.3	37.84
All other states (see Table 56).....	175	9,909	6.9	26.60

<sup>1</sup> TUPELO (or COTTON GUM) (*Nyssa aquatica*) is cut in the Gulf states.  
 BLACK GUM (or PEPPERIDGE) (*Nyssa sylvatica*) is cut in the Atlantic and Central states and is sold both as tupelo and black gum.  
 WATER GUM (*Nyssa biflora*) is cut to a small extent in the South Atlantic states.

## SUGAR PINE.

Sugar-pine forests extend several hundred miles along the Sierra Nevada Mountains in California and cover a considerable area in southern Oregon. The tree is the largest American pine, and the wood resembles white pine.

The annual cut of lumber from this species has not varied greatly since 1905. The largest output, 169,247,000 feet, was reported for 1916.

In 1919 the average cut per mill of sugar-pine lumber in California was 3,490,676 feet and in Oregon, 750,500 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$16.77; for 1917, \$24.69; for 1918, \$28.26; and for 1919, \$35.99.

TABLE 45.—PRODUCTION OF SUGAR PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	43	133,658	100.0	\$35.99
California.....	37	129,155	96.6	36.35
Oregon.....	6	4,503	3.4	26.07

<sup>1</sup> SUGAR PINE (*Pinus lambertiana*) is the only species cut as such and is found commercially only in California and southern Oregon.

## BALSAM FIR.

Balsam fir is cut in the northern part of the United States as far west as Minnesota and in the Appalachian Mountain region as far south as North Carolina, nine states contributing to the total cut in 1919.

The cut of lumber from this species was first reported separately in 1905. Since that time, Maine has led in the production for each year for which records are available, the proportion of the total annual cut reported by this state ranging from 44.9 per cent in 1919 to 65.6 per cent in 1907.

The average value at the mill per thousand feet of balsam fir lumber for 1916 was \$16.49; for 1917, \$20.02; for 1918, \$27.27; and for 1919, \$32.23.

TABLE 46.—PRODUCTION OF BALSAM FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	413	68,030	100.0	\$32.23
Maine.....	175	30,512	44.9	31.73
New Hampshire.....	19	15,990	23.5	37.72
Minnesota.....	66	10,584	15.6	25.20
Vermont.....	74	4,415	6.5	31.39
New York.....	25	2,616	3.8	35.60
All other states (see Table 56).....	54	3,913	5.8	31.38

<sup>1</sup> BALSAM FIR (*Abies balsamea*) is the only species cut as such.

## WALNUT.

Walnut lumber was reported by 28 states for 1919. The production during the past 20 years has been fairly constant, the largest annual output reported being less than 90,000,000 feet.

Missouri, Indiana, and Ohio have been the leading states in the production of this lumber since 1899.

During the past four years, Missouri has occupied first place, reporting for 1919 more than one-fifth of the total output for the United States.

Besides the quantity of walnut sawed into lumber, a considerable amount was consumed in the manufacture of veneers each year. It is the most suitable wood for all varieties of gunstocks of the common grades.

This is the highest priced native wood cut into lumber to any considerable extent. The average value at the mill per thousand feet for 1916 was \$42.38; for 1917, \$72.99; for 1918, \$77.60; and for 1919, \$72.13.

TABLE 47.—PRODUCTION OF WALNUT<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	688	30,218	100.0	\$72.13
Missouri.....	47	8,508	21.7	39.05
Indiana.....	133	6,416	16.4	30.59
Ohio.....	107	5,097	13.0	76.54
Iowa.....	15	5,074	12.9	124.00
Illinois.....	22	3,690	9.4	71.39
Tennessee.....	80	2,746	7.0	57.37
Kansas.....	3	2,580	6.6	96.00
Kentucky.....	75	2,033	5.2	33.39
All other states (see Table 56).....	206	3,074	7.8	37.08

<sup>1</sup> BLACK WALNUT (*Juglans nigra*) is the only species cut as such.

## SYCAMORE.

Sycamore has not attained great prominence as a lumber timber. The trees are scattered, usually growing on the banks of rivers and smaller streams. It is what might be termed a waste-ground tree and resembles cottonwood in choice of location and habits of growth.

The production of sycamore lumber is well distributed and was reported from 23 states for 1919. The largest cut reported for any year for which records are available was 56,511,000 feet for 1909. The output during the past four years has been practically constant, the leading state during this period being Arkansas. Indiana has occupied second place, except for 1917, when Tennessee reported a greater production.

TABLE 48.—PRODUCTION OF SYCAMORE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	810	28,114	100.0	\$30.32
Arkansas.....	50	8,767	31.2	31.83
Indiana.....	191	4,589	16.3	31.77
Missouri.....	102	3,173	11.3	28.57
Tennessee.....	54	2,247	8.0	31.98
Kentucky.....	80	2,109	7.8	23.49
Illinois.....	48	1,474	5.2	31.00
Ohio.....	97	1,365	4.8	33.90
All other states (see Table 56).....	191	4,310	15.3	23.22

<sup>1</sup> SYCAMORE (*Platanus occidentalis*) is the only species cut as such.

The average value at the mill per thousand feet of sycamore lumber for 1916 was \$14.65; for 1917, \$18.68; for 1918, \$23.59; and for 1919, \$30.32.

LOGEPOLE PINE.

Lodgepole pine is most abundant in the western mountains. This wood grows very slowly and the trees do not reach saw-log size until about 100 years old. Although extensive areas are covered with young trees, the cut from lodgepole pine will probably not figure prominently in the lumber output for the United States.

The cut of this species was reported separately for the first time for 1909. It has not been very important as a lumber timber, the largest cut reported for any one year for which records are available being 33,014,000 feet for 1911.

For 1919 the lumber production from this wood was reported by six states, Colorado furnishing nearly 80 per cent of the total cut.

The average value at the mill per thousand feet of lodgepole pine lumber for 1916 was \$15.13; for 1917, \$18.34; for 1918, \$20.95; and for 1919, \$29.98.

TABLE 49.—PRODUCTION OF LOGEPOLE PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	75	16,281	100.0	\$29.98
Colorado.....	25	12,879	79.1	31.15
Utah.....	14	1,328	8.1	24.64
Wyoming.....	18	1,307	8.0	24.50
All other states (see Table 56).....	18	769	4.7	28.89

<sup>1</sup> LOGEPOLE PINE (*Pinus contorta*) is the only species cut as such.

MINOR SPECIES.

The production of lumber from 23 kinds of wood not cut into lumber in sufficient quantities to warrant separate statistics was included in the total output reported for 1919.

Many of these woods, particularly mahogany, dogwood, and Spanish cedar, are used for special purposes and their average values are considerably higher than those of the more common woods. The quantity figures for minor species are not to be accepted as complete, since many mills include the cut of such woods with that of better known species.

The increase in the average values reported for most of these species is very marked. For instance, the average value of mahogany was reported as \$107.47 in 1916, \$128.06 in 1917, \$160.62 in 1918, and \$205.47 in 1919. The average value of all minor species reported in 1916 was \$57.29; in 1917, \$75.11; in 1918, \$82.80; and in 1919, \$114.89.

TABLE 50.—PRODUCTION OF LUMBER FROM MINOR SPECIES: 1919.

KIND OF WOOD.	Quantity reported (M feet b. m.).	Average value per M feet, f.o.b. mill.	Principal states reporting.
Total.....	61,308	\$114.89	
Mahogany.....	26,659	205.47	Louisiana, Kentucky, New York, and Massachusetts.
Cherry.....	10,060	47.94	West Virginia, Pennsylvania, New York, Indiana, Michigan, and Ohio.
Willow.....	6,571	34.43	Louisiana, Mississippi, Arkansas, Iowa, and Indiana.
Buckeye.....	4,536	32.32	Tennessee, North Carolina, Virginia, West Virginia, and Kentucky.
Locust.....	3,027	42.40	West Virginia, Pennsylvania, Virginia, Indiana, Arkansas, and Tennessee.
Pecan.....	2,227	32.52	Arkansas, Mississippi, Louisiana, and Tennessee.
Magnolia.....	2,200	28.01	Louisiana, Mississippi, and Texas.
Dogwood.....	1,530	151.99	Tennessee, Texas, North Carolina, and Georgia.
Persimmon.....	1,201	33.22	Tennessee, Florida, and Arkansas.
Hackberry.....	1,142	33.82	Arkansas, Ohio, Illinois, Oklahoma, Tennessee, and Missouri.
Butternut.....	881	33.67	Wisconsin, West Virginia, Virginia, Pennsylvania, and Indiana.
Red Bay.....	469	24.67	Georgia, Alabama, and South Carolina.
Spanish cedar.....	359	220.64	Louisiana and Illinois.
Cucumber.....	222	37.45	Pennsylvania, West Virginia, and Ohio.
Silverbell.....	81	28.88	Tennessee.
Apple.....	53	50.00	New York and Illinois.
Sassafras.....	32	32.78	Arkansas, Illinois, and Pennsylvania.
Alder.....	18	34.67	Washington and Oregon.
Holly.....	16	43.88	Arkansas and Louisiana.
Box elder.....	14	33.79	North Carolina.
Koko.....	8	120.00	Illinois.
Sourwood.....	1	33.00	North Carolina.
Coffeetree.....	1	32.00	Indiana.

Leading states and species.—The following statement shows the states which, in 1919, led in the production of lumber from one or more of the 29 principal species for which detailed statistics are presented in the preceding tables.

Of the 16 states shown in the statement, 2—Arkansas and Wisconsin—each led in the production of lumber from four kinds of wood; 3—California, Louisiana, and Washington—each led in the production from three kinds; 1—West Virginia—from two kinds; and 10 states each from one kind.

STATEMENT "A."

STATE.	Kind or kinds of wood in the cut of which the specified state ranked first in 1919.
Arkansas.....	Red gum, hickory, ash, and sycamore.
California.....	Redwood, white fir, and sugar pine.
Colorado.....	Lodgepole pine.
Idaho.....	Larch.
Indiana.....	Beech.
Louisiana.....	Yellow pine, cypress, and tupelo.
Maine.....	Balsam fir.
Michigan.....	Maple.
Minnesota.....	White pine.
Mississippi.....	Cottonwood.
Missouri.....	Walnut.
Oregon.....	Western yellow pine.
Tennessee.....	Oak.
Washington.....	Douglas fir, spruce, and cedar.
West Virginia.....	Chestnut and yellow poplar.
Wisconsin.....	Hemlock, birch, elm, and basswood.

In 1919, 12 states each reported more than 1,000,-000,000 feet of lumber. In 10 of these states the output of a certain kind of lumber exceeded the combined output of all other kinds. In 8 of these states yellow pine contributed over one-half of the total cut, and in 2 states Douglas fir was the predominant wood. These states are shown in the following statement.

STATEMENT "B."

STATE.	Principal kind of wood cut in 1919.	Per cent that out of specified kind of wood forms of total out of state.
Alabama.....	Yellow pine.....	91.3
Arkansas.....	Yellow pine.....	59.2
California.....	Western yellow pine.....	35.3
Florida.....	Yellow pine.....	88.3
Louisiana.....	Yellow pine.....	78.1
Mississippi.....	Yellow pine.....	82.0
North Carolina.....	Yellow pine.....	75.0
Oregon.....	Douglas fir.....	69.7
Texas.....	Yellow pine.....	96.4
Virginia.....	Yellow pine.....	58.0
Washington.....	Douglas fir.....	78.1
Wisconsin.....	Hemlock.....	39.4

Average value of lumber, by kinds of wood (Table 51).—Comparative figures showing the average value per thousand feet of lumber at point of production for two decades are presented in Table 51. The average values shown in this table were based on returns from the majority of the merchant establishments reporting for each year. The values reported by establishments located in the various states and even by establishments located within certain districts naturally showed great differences, for the reason that the value at the mill depends largely on the local demand in the case of smaller mills, and the nearness of the market and shipping facilities in the case of larger plants.

During the period covered by these statistics a great change has taken place in the lumber industry in the United States. It is not expected that the average values at the mill will again reach as low a level as reported for the earlier years, and a decrease in the production of lumber may be looked for from year to year on account of the depletion of the timber supply.

TABLE 51.—AVERAGE VALUE OF LUMBER AT THE MILL PER M FEET B. M., BY KINDS OF WOOD, FOR SPECIFIED YEARS: 1899-1919.

KIND OF WOOD.	1919	1918	1917	1916	1915	1911	1910	1909	1907	1904	1899
All kinds.....	\$30.21	\$24.79	\$20.32	\$15.82	\$14.04	\$15.05	\$15.30	\$15.38	\$16.56	\$12.76	\$11.13
SOFTWOODS.											
Yellow pine.....	28.71	24.38	19.00	14.33	12.41	13.87	13.20	12.60	14.02	9.06	8.48
Douglas fir.....	24.62	18.77	16.28	10.78	10.59	11.05	13.09	12.44	14.12	9.51	8.67
Western yellow pine.....	27.75	20.87	19.59	14.52	14.32	13.62	14.25	15.39	15.67	11.30	9.70
Hemlock.....	29.16	23.97	20.78	15.95	13.14	13.59	13.85	13.95	15.53	11.91	9.38
White pine.....	32.83	30.84	24.81	19.16	17.44	18.54	18.93	18.16	19.41	14.93	12.69
Spruce.....	30.76	28.65	24.41	17.58	16.58	16.14	16.62	16.01	17.26	14.03	11.27
Cypress.....	38.38	30.50	23.02	20.85	20.85	20.54	20.51	20.40	22.12	17.50	13.32
Redwood.....	30.04	24.30	21.00	13.93	13.54	13.99	15.52	14.80	17.70	12.83	10.12
Larch (tamarack).....	28.39	19.89	16.21	12.49	10.78	11.87	12.33	12.08	13.99	11.39	8.73
Cedar.....	38.80	24.89	19.40	15.24	10.10	13.86	15.53	19.95	19.14	14.85	10.91
White fir.....	25.66	19.61	17.10	12.25	10.94	10.94	11.52	13.10	15.54	( <sup>1</sup> )	( <sup>1</sup> )
Sugar pine.....	35.99	28.29	24.69	16.77	17.40	17.52	18.08	18.14	19.84	( <sup>1</sup> )	12.30
Balsam fir.....	32.23	27.27	20.02	16.49	13.79	13.42	14.48	13.99	16.16	( <sup>1</sup> )	( <sup>1</sup> )
Lodgepole pine.....	29.98	20.95	18.34	15.13	13.57	12.41	14.88	16.25	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
HARDWOODS.											
Oak.....	37.87	31.11	24.49	20.09	18.73	19.14	18.70	20.50	21.23	17.51	13.78
Maple.....	35.56	29.05	23.16	18.24	15.21	15.49	18.16	15.77	16.84	14.94	11.83
Gum, red and sap.....	32.68	23.21	19.56	14.64	12.54	12.11	12.20	13.20	14.10	10.87	9.63
Chestnut.....	32.30	27.31	21.54	17.05	16.17	16.63	16.23	16.12	17.04	13.78	13.37
Birch.....	35.79	29.04	24.07	19.50	16.52	16.61	17.37	16.95	17.37	15.44	12.50
Beech.....	29.98	25.06	19.58	16.20	14.01	14.09	14.34	13.25	14.30	( <sup>1</sup> )	( <sup>1</sup> )
Yellow poplar.....	41.65	35.09	27.17	21.39	22.45	25.40	24.71	25.39	24.91	18.99	14.03
Elm.....	36.39	28.19	23.89	19.40	16.98	17.13	18.67	17.52	18.45	14.45	11.47
Basswood.....	40.03	34.00	25.96	21.05	18.89	19.20	20.04	19.50	20.03	16.86	12.84
Hickory.....	44.37	37.05	29.48	23.84	23.35	22.47	26.55	30.80	29.50	23.04	18.78
Ash.....	52.69	38.70	30.01	23.85	22.15	21.21	22.47	24.44	25.01	18.77	15.84
Cottonwood.....	32.24	26.13	23.19	17.42	17.36	18.12	17.78	18.05	18.43	14.92	10.37
Tupelo.....	28.42	22.78	18.06	13.00	12.25	12.46	12.14	11.87	14.45	( <sup>1</sup> )	( <sup>1</sup> )
Walnut.....	72.13	77.00	72.99	42.38	48.37	31.70	34.91	43.79	43.31	45.04	36.49
Sycamore.....	30.32	23.59	18.68	14.65	13.80	13.16	14.10	14.37	14.58	( <sup>1</sup> )	11.04

<sup>1</sup> Data not obtained.

LATH.

Comparative production (Table 52).—The output of lath fluctuates with the demand for building purposes and the slump in the building operations during 1918 and the increased demand for 1919 are reflected in the figures. The total number of mills reporting in 1918 was 909, the figures for 1919 being an increase of 24.6

per cent in the number of mills and 26.6 per cent in the total production. The largest cut of lath during the past 20 years was reported for 1906.

Production, by states (Table 53).—Lath is usually a by-product of sawmills. In 1919 only 18 establishments which did not saw lumber reported the production of lath, their combined output being 31,091,000 pieces, or 1.8 per cent of the total.

In 1919 Washington led in the production of lath. In 1918 Louisiana ranked first, Minnesota second, and Washington third.

TABLE 52.—PRODUCTION OF LATH FOR SPECIFIED YEARS: 1899-1919.

YEAR.	Quantity (thousands).	Average value per thousand.	YEAR.	Quantity (thousands).	Average value per thousand.
1919.....	1,724,078	\$4.81	1909.....	3,703,195	\$2.99
1918.....	1,362,187	(1)	1908.....	2,986,684	2.27
1917.....	2,281,738	(1)	1907.....	3,663,602	2.82
1916.....	2,754,683	(1)	1906.....	3,812,807	3.01
1915.....	2,746,134	(1)	1905.....	3,111,157	(1)
1912.....	2,719,163	(1)	1904.....	2,647,847	2.05
1911.....	2,971,110	2.61	1899.....	2,523,998	1.86
1910.....	3,494,718	2.31			

<sup>1</sup> Not available.

TABLE 53.—PRODUCTION OF LATH, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (thousands).	Per cent distribution.	Average value per thousand.
United States.....	1,133	1,724,078	100.0	\$4.81
Washington.....	72	330,058	19.7	4.19
Louisiana.....	59	199,018	11.5	5.02
Wisconsin.....	82	138,936	8.1	5.27
Oregon.....	37	122,848	7.1	4.24
Minnesota.....	44	115,741	6.7	5.24
Maine.....	71	104,223	6.0	5.21
Mississippi.....	28	96,204	5.6	5.20
Florida.....	34	76,402	4.4	4.97
Arkansas.....	25	72,827	4.2	4.24
Idaho.....	23	69,150	4.0	3.72
California.....	18	53,042	3.1	4.43
Michigan.....	53	51,469	3.0	5.01
Alabama.....	24	42,502	2.5	5.88
Texas.....	10	35,918	2.1	5.17
Virginia.....	46	27,073	1.6	6.38
All other states (see Table 56).....	507	179,689	10.4	5.34

SHINGLES.

Comparative production (Table 54).—The production of shingles reflects to a certain extent the activities in building lines, but the substitution of other materials for roofing has doubtless affected the output considerably.

The largest cut during the past 20 years was reported for 1905 and the smallest for 1918. The 1919 cut compared with that of 1918 increased 61.6 per cent.

Washington has been the leading shingle state for all years since 1899 for which records are available. Michigan, Louisiana, and Oregon have each in turn occupied second place.

Production, by states (Table 55).—By far the greater number of establishments which produced shingles were also engaged in the manufacture of lumber. In 1919, however, 449 establishments which did not manufacture lumber reported the production of 5,830,345,000 shingles, or 63.4 per cent of the total quantity for the United States. More than one-half of the exclusive shingle mills were located in the Pacific Coast states, which is the main shingle-producing region, largely because of the particular adaptability of the western cedar.

Cedar is the principal wood sawed into shingles and for those years for which records are available, it furnished about three-fourths of the total cut. Cypress is next in importance and contributed approximately one-tenth of the total output for the years for which such data were secured. The cut by kinds of wood was not ascertained for 1919.

TABLE 54.—PRODUCTION OF SHINGLES FOR SPECIFIED YEARS: 1899-1919.

YEAR.	Quantity (thousands).	Average value per thousand.	YEAR.	Quantity (thousands).	Average value per thousand.
1919.....	9,192,704	\$4.19	1909.....	14,907,371	\$2.03
1918.....	5,690,182	(1)	1908.....	12,106,483	2.00
1917.....	8,696,513	(1)	1907.....	11,824,475	2.55
1916.....	9,371,333	(1)	1906.....	11,838,260	2.04
1915.....	8,459,378	(1)	1905.....	15,340,909	(1)
1912.....	12,037,685	(1)	1904.....	14,546,551	1.65
1911.....	12,113,867	2.07	1899.....	12,102,017	1.56
1910.....	12,976,362	2.00			

<sup>1</sup> Not available.

TABLE 55.—PRODUCTION OF SHINGLES, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (thousands).	Per cent distribution.	Average value per thousand.
United States.....	1,726	9,192,704	100.0	\$4.19
Washington.....	292	7,095,122	77.2	4.16
Oregon.....	53	530,066	5.8	3.77
Louisiana.....	52	300,784	3.3	4.47
California.....	40	191,831	2.1	4.18
Maine.....	182	188,576	2.0	4.19
Michigan.....	63	144,173	1.6	3.89
Florida.....	71	128,286	1.4	4.41
Georgia.....	142	114,806	1.2	4.54
Arkansas.....	63	98,937	1.1	4.32
Wisconsin.....	58	96,928	1.1	4.13
North Carolina.....	74	92,139	1.0	6.58
Alabama.....	124	62,241	0.7	4.66
Mississippi.....	28	34,002	0.4	4.72
All other states (see Table 56).....	484	114,813	1.2	4.81

SUMMARY.

Table 56 shows in condensed form, for 1919, the number of mills reporting and the production of lumber from the principal hardwoods and softwoods, by kinds of wood and by states; also the production of lath and shingles, by states.

North Dakota did not report the manufacture of lumber, and therefore does not appear in these statistics.

A majority of the mills producing shingles and lath also reported the production of lumber. In the preceding tables for lumber, lath, and shingles, the number of mills reporting each class of product is given; consequently, duplication in the number of mills occurs in the case of those that reported more than one class. In Table 56 this duplication has been eliminated and the actual number of mills reporting one or more of these products is shown. In addition to the 29,534 mills reporting the production of lumber, there were 467 mills which did not saw lumber but reported the production of shingles or lath. Of these, 449 reported shingles and 18 lath.

TABLE 56.—ACTIVE SAWMILLS REPORTING, AND REPORTED PRODUCTION OF EACH KIND OF LUMBER, AND OF LATH AND SHINGLES, BY STATES: 1919.

1	STATE.	Number of active mills reporting.	LUMBER SAWED (M FEET B. M.).										
			Aggregate.	SOFTWOODS.									
				Total.	Yellow pine.	Douglas fir.	Western yellow pine.	Hemlock.	White pine.	Spruce.	Cypress.	Red-wood.	Larch.
1	United States....	30,001	34,552,076	27,407,130	13,062,938	5,902,169	1,755,015	1,754,998	1,723,642	979,908	660,212	410,442	388,121
2	Alabama.....	1,953	1,708,740	1,657,873	1,642,588					100	13,776		
3	Arizona.....	20	73,655	73,655		33	73,622						
4	Arkansas.....	1,465	1,772,157	1,003,055	1,049,340						43,335		
5	California.....	173	1,259,363	1,258,953		141,327	444,150	909		4,190		410,442	
6	Colorado.....	133	64,804	64,804		3,118	32,773			10,018			
7	Connecticut.....	231	86,708	15,170				3,946	11,194				
8	Delaware.....	80	27,437	21,318								13	
9	Florida.....	446	1,137,432	1,125,199	1,004,706						120,433		
10	Georgia.....	1,815	893,965	813,335	767,217			821	1,857		43,440		
11	Idaho.....	182	765,388	765,082		32,580	255,320	1,918	234,207	6,017			143,655
12	Illinois.....	252	64,028	2,792	7						2,228		
13	Indiana.....	708	232,487	496				2	5	253			3
14	Iowa.....	85	18,493	362					285				77
15	Kansas.....	6	2,840										
16	Kentucky.....	1,224	512,078	31,010	10,858			10,000	3,575		4,574		
17	Louisiana.....	488	3,163,871	2,778,546	2,470,407						308,139		
18	Maine.....	607	596,116	556,164				85,542	223,843	208,645			177
19	Maryland.....	507	113,362	56,788	53,445			1,582	805	216	649		
20	Massachusetts.....	272	166,841	121,711				12,825	104,200	4,603			
21	Michigan.....	380	875,891	349,216				267,824	57,501	8,417			9,634
22	Minnesota.....	305	699,039	637,296					560,544	29,208			35,765
23	Mississippi.....	1,452	2,390,135	1,997,696	1,980,395						17,291		
24	Missouri.....	798	321,383	87,238	45,299						41,466		16
25	Montana.....	125	287,378	286,518		40,676	108,548	29	371	34,064			101,714
26	Nebraska.....	5	505										
27	Nevada.....	3	20,335	20,335			13,420						
28	New Hampshire.....	355	338,777	299,229				31,404	170,012	75,811			10
29	New Jersey.....	166	39,888	13,239	7,809			354	66				
30	New Mexico.....	50	86,808	86,808		9,069	75,439			1,185			
31	New York.....	1,237	357,764	160,904	94			70,002	49,220	29,341			74
32	North Carolina.....	3,226	1,654,435	1,359,716	1,240,142			48,462	6,532	42,976	17,468		
33	Ohio.....	773	280,076	509	102			355	49	3			
34	Oklahoma.....	153	168,403	144,412	144,412								
35	Oregon.....	544	2,577,403	2,574,597		1,795,492	489,514	52,900	664	106,066			18,968
36	Pennsylvania.....	1,531	630,471	271,752	1,537			225,155	44,213	591			
37	Rhode Island.....	30	11,030	3,022				100	2,799				
38	South Carolina.....	812	621,079	573,001	544,475						27,482		
39	South Dakota.....	41	42,970	42,970			42,970						
40	Tennessee.....	1,858	792,132	170,351	95,979			40,221	12,519		6,924		
41	Texas.....	450	1,379,774	1,332,832	1,330,784						2,097		
42	Utah.....	82	11,917	11,847		909	6,688			2,001			
43	Vermont.....	499	218,479	124,763				31,554	30,344	58,059			23
44	Virginia.....	2,249	1,098,038	695,112	646,834			28,744	10,742	1,004	6,897		
45	Washington.....	798	4,961,220	4,960,926		3,876,031	217,839	286,854	63,214	229,145			63,870
46	West Virginia.....	736	793,103	163,109	5,190			104,582	2,832	50,414			
47	Wisconsin.....	492	1,116,338	594,125				439,757	125,059	10,646			14,723
48	Wyoming.....	54	8,674	8,674		2,335	3,752			915			

TABLE 56.—ACTIVE SAWMILLS REPORTING, AND REPORTED PRODUCTION OF EACH KIND OF LUMBER, AND OF LATH AND SHINGLES, BY STATES: 1919—Continued.

STATE.		LUMBER SAWED (M FEET B. M.)—Continued.											
		SOFTWOODS—continued.					HARDWOODS.						
		Cedar.	White fir.	Sugar pine.	Balsam fir.	Lodgepole pine.	Total.	Oak.	Maple.	Red gum.	Chestnut.	Birch.	Beech.
1	United States.....	332,234	223,422	133,658	68,030	16,281	7,144,946	2,708,280	857,489	851,431	545,696	375,079	358,985
2	Alabama.....	1,409					140,873	61,189	2,753	39,349	2,217	175	362
3	Arizona.....												
4	Arkansas.....	380					679,102	300,523	8,698	238,327		167	295
5	California.....	20,406	108,374	120,155			410	410					
6	Colorado.....		70			12,879							
7	Connecticut.....	30					71,638	18,727	3,054		44,644	1,761	475
8	Delaware.....	3					6,119	4,787	41	719	139		
9	Florida.....						12,233	1,232	224	4,294			
10	Georgia.....						80,630	34,537	400	15,510	2,413	8	235
11	Idaho.....	20,165	65,404			416	306						
12	Illinois.....	527					61,866	34,811	3,758	3,906	95	223	813
13	Indiana.....	233					281,991	109,583	33,396	6,435	301	156	57,107
14	Iowa.....						18,131	4,066	579			142	
15	Kansas.....						2,840	34					
16	Kentucky.....	2,513					480,468	282,963	6,998	31,692	24,850	1,247	37,459
17	Louisiana.....						385,325	85,105	209	147,260			6,740
18	Maine.....	7,445			30,512		39,952	4,138	5,572		589	21,533	5,388
19	Maryland.....	1					56,574	31,427	1,886	2,547	14,287	150	1,121
20	Massachusetts.....	72			11		45,130	6,099	2,795		30,222	2,916	1,355
21	Michigan.....	4,014			1,826		526,675	16,239	321,409		15	63,533	49,125
22	Minnesota.....	1,105			10,584		62,343	8,518	1,868			9,986	
23	Mississippi.....						392,449	132,804	5,479	168,226			1,020
24	Missouri.....	455					234,145	150,031	8,934	31,105		171	31
25	Montana.....	189	576			352	860						
26	Nebraska.....						505						
27	Nevada.....	1,056	5,859				39,548	4,780	9,562		2,678	12,229	8,953
28	New Hampshire.....	2			15,990		23,649	13,887	280	325	7,397	27	252
29	New Jersey.....	5,010											
30	New Mexico.....		1,115										
31	New York.....	497			2,616		196,880	24,051	56,884	5	14,863	29,719	38,463
32	North Carolina.....	4,130					294,719	136,129	11,977	21,507	69,507	2,169	1,590
33	Ohio.....						279,567	133,107	34,787	3,480	11,840	634	37,907
34	Oklahoma.....						23,991	19,750	20	640			150
35	Oregon.....	32,763	22,731	4,503			2,806		1,160				
36	Pennsylvania.....	81			175		358,719	145,421	48,610	2,263	85,777	10,541	39,247
37	Rhode Island.....	123					8,008	2,357	390		5,080	112	
38	South Carolina.....	1,044					48,678	11,321	1,416	21,917			5
39	South Dakota.....												
40	Tennessee.....	14,708					621,781	349,725	6,974	80,025	39,511	1,069	14,290
41	Texas.....	1					46,942	28,605	1,579	11,924		43	60
42	Utah.....		943			1,326	70						
43	Vermont.....	308			4,415		93,716	5,668	33,289		1,726	26,394	14,572
44	Virginia.....	891					402,926	240,707	7,053	16,888	69,458	6,677	3,894
45	Washington.....	205,393	17,979			1	294		83				
46	West Virginia.....	85					599,994	279,891	58,242	3,087	118,087	8,414	30,073
47	Wisconsin.....	1,120			1,901		522,213	25,578	177,125			174,873	8,003
48	Wyoming.....		385			1,807							



WOOD CONSUMED IN THE MANUFACTURE OF VENEERS.

In the early history of the industry, veneers were manufactured from the best grades of cabinet woods and used for covering or veneering inferior woods, the species generally used being those that possessed a pleasing grain and took a good finish. The tendency in the industry in more recent years, however, has been to produce veneers from the more common woods and to extend their use to cover a much wider field. Veneers are known as rotary cut, sliced, or sawed, according to the process by which they are made. The process chosen is determined largely by the kind of wood and the particular purpose for which the veneer is to be used.

The schedule used in collecting these statistics for 1919 called for the average cost of wood delivered at the mill per thousand feet log scale, in addition to the quantity consumed. The average cost was generally reported, but in a few instances it has been necessary to supply an average cost derived from other reports.

Comparative consumption of wood, by states (Table 57).—The veneer industry is widely distributed in the United States. In 1919 and 1909 reports were received from 34 states and in 1911 from 33 states, all of the principal timber sections in the United States being represented in the statistics. The data relate to 362 establishments in 1919, 522 in 1911, and 637 in 1909.

TABLE 57.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY STATES: 1919, 1911, AND 1909.

STATE.	QUANTITY OF WOOD (M FEET).			PER CENT DISTRIBUTION.		
	1919	1911	1909	1919	1911	1909
United States.....	576,581	444,886	435,981	100.0	100.0	100.0
Arkansas.....	77,096	39,073	26,116	13.4	8.8	6.0
Wisconsin.....	50,502	30,059	31,737	8.8	6.8	7.3
Florida.....	43,936	20,664	33,293	7.6	4.6	7.6
Alabama.....	42,342	15,438	14,565	7.3	3.5	3.3
Mississippi.....	39,061	17,339	7,563	6.8	3.9	1.7
Tennessee.....	38,895	23,425	30,574	6.7	5.3	7.0
New York.....	38,571	23,578	24,218	6.7	5.3	5.6
North Carolina.....	30,423	24,061	19,984	5.3	5.4	4.6
Illinois.....	24,367	29,339	35,646	4.2	6.6	8.2
Indiana.....	24,254	28,525	31,472	4.2	6.4	7.2
Kentucky.....	22,971	29,194	19,356	4.0	6.6	4.4
Missouri.....	18,103	25,806	27,365	3.1	5.8	6.3
Georgia.....	14,863	5,890	6,980	2.6	1.3	1.6
Washington.....	11,320	7,533	5,419	2.5	1.7	1.2
Michigan.....	12,647	32,677	33,455	2.2	7.3	7.7
Maine.....	11,562	5,000	3,637	2.0	1.1	0.8
Louisiana.....	11,407	4,726	3,164	2.0	1.1	0.7
South Carolina.....	11,151	2,874	2,944	1.9	0.6	0.7
Oregon.....	8,764	9,581	3,291	1.5	2.2	0.8
Virginia.....	7,521	18,959	21,609	1.3	4.3	5.0
Ohio.....	6,042	13,374	10,985	1.0	3.0	2.5
Texas.....	5,174	4,573	6,710	0.9	1.0	1.5
Maryland.....	5,103	12,632	8,796	0.9	2.8	2.0
Vermont.....	4,971	5,575	8,013	0.9	1.3	1.8
West Virginia.....	3,478	5,558	4,404	0.6	1.2	1.0
New Jersey.....	1,197	863	1,046	0.2	0.2	0.2
Pennsylvania.....	1,002	2,607	3,691	0.2	0.6	0.9
All other states <sup>1</sup> .....	6,849	5,966	9,948	1.2	1.3	2.3

<sup>1</sup> Includes California, Colorado, Delaware, Kansas, Massachusetts, Minnesota, and New Hampshire for 1919; California, Delaware, Iowa, Massachusetts, Minnesota, and New Hampshire for 1911; and California, Delaware, Iowa, Massachusetts, Minnesota, New Hampshire, and Oklahoma for 1909.

While the number of establishments shows a decrease for both of the periods covered, the quantity of wood used increased 2 per cent from 1909 to 1911, and 29.6 per cent from 1911 to 1919. The quantity of wood consumed in 1919 was greater than that for any other year for which records are available.

The center of production has shifted according to the available supply of timber, as for most other industries depending upon forest products. In 1909 Illinois was the leading state in the use of wood in the manufacture of veneers, while Arkansas led in 1911 and 1919. The principal reason for the prominence of Arkansas in this industry is no doubt its large supply of suitable timber, particularly red gum. In 1919 this wood contributed 82.2 per cent of the total quantity of wood used in the industry in the state.

Comparative consumption, by kinds of wood (Table 58).—In 1919, 37 different kinds of wood were reported as used in the manufacture of veneers.

TABLE 58.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY KINDS OF WOOD: 1919, 1911, AND 1909.

KIND OF WOOD.	QUANTITY OF WOOD (M FEET).			PER CENT DISTRIBUTION.		
	1919	1911	1909	1919	1911	1909
Total.....	576,581	444,886	435,981	100.0	100.0	100.0
Domestic:						
Red gum.....	198,641	136,542	129,930	34.5	30.7	29.8
Yellow pine.....	67,071	35,400	48,143	11.6	8.0	11.0
Birch.....	54,079	24,208	24,643	9.4	5.4	5.7
Cottonwood.....	36,739	34,911	30,842	6.4	7.8	7.1
Tupelo.....	34,175	20,976	18,476	5.9	4.7	4.2
Yellow poplar.....	32,653	25,835	28,826	5.7	5.8	6.6
White oak.....	30,654	41,742	28,742	5.3	9.4	6.6
Maple.....	15,723	29,762	35,444	2.7	6.7	8.1
Walnut.....	14,060	4,121	2,400	2.4	0.9	0.6
Spruce.....	11,355	9,108	4,111	2.0	2.0	0.9
Basswood.....	11,134	11,602	13,715	1.9	2.6	3.1
Douglas fir.....	10,604	6,262	1,111	1.8	1.4	0.3
Elm.....	9,578	18,340	16,254	1.7	4.1	3.7
Beech.....	3,922	12,023	9,950	0.7	2.7	2.3
Ash.....	3,254	2,491	2,703	0.6	0.6	0.6
Red oak.....	3,161	9,297	6,661	0.5	2.1	1.5
Cypress.....	1,924	202	202	0.3	( <sup>1</sup> )	( <sup>1</sup> )
Sycamore.....	1,802	2,316	4,404	0.3	0.5	1.0
Western pine.....	1,659			0.3		
Hemlock.....	916	4,603	207	0.2	1.0	( <sup>1</sup> )
Magnolia.....	268		252	0.1		0.1
All other.....	2783	3,652	4,415	0.1	0.8	1.0
Imported:						
Mahogany.....	27,628	4,790	16,057	4.8	1.1	3.7
Spanish cedar.....	4,771	5,345	5,140	0.8	1.2	1.2
All other <sup>2</sup> .....	27	1,557	3,353	( <sup>1</sup> )	0.4	0.8

<sup>1</sup> Less than one-tenth of 1 per cent.  
<sup>2</sup> Includes butternut, hackberry, redwood, wahoo, white pine, holly, cherry, willow, chestnut, Port Orford cedar, black gum, and sugar pine.  
<sup>3</sup> Includes Circassian walnut and English oak.

Of the 37 kinds of wood reported, 1 imported wood and 12 native woods each contributed more than 10,000,000 feet to the total. Red gum is used in the manufacture of veneers where inexpensive material is demanded, as well as for high-grade stock. It takes a fine finish and has a pleasing grain. For such years as data are available this wood has occupied first place, and yellow pine, maple, cottonwood,

and white oak have vied for second place when ranked according to the quantity consumed. In 1919 red gum, yellow pine, and birch contributed 55.5 per cent of the total for the United States.

Consumption and cost, by kinds of wood (Table 59).—In 1909 the total cost of wood consumed in the manufacture of veneers was \$8,977,516. Compared with the cost for 1909, the cost for 1919 increased \$16,126,648, or 179.6 per cent, the greatest increases being for imported woods. The average cost per thousand feet increased 126.2 per cent for mahogany and 61.2 per cent for Spanish cedar, while for walnut, the highest-priced native wood, the average cost increased 74.2 per cent, and for white oak, 71.7 per cent. The cost of wood was not reported for the year 1911.

TABLE 59.—QUANTITY AND COST OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY KINDS OF WOOD: 1919.

KIND OF WOOD.	Quantity of wood (M feet).	COST.	
		Total.	Average per M <sup>1</sup> feet.
Total.....	576,581	\$25,104,164	\$43.54
<b>Domestic:</b>			
Red gum.....	108,641	4,016,727	23.24
Yellow pine.....	67,071	1,208,095	18.32
Birch.....	54,079	2,577,924	47.67
Cottonwood.....	36,789	854,350	23.25
Tupelo.....	34,175	616,784	18.05
Yellow poplar.....	32,653	1,570,233	48.09
White oak.....	30,654	2,447,719	79.85
Maple.....	15,723	606,057	38.55
Walnut.....	14,060	1,098,837	120.83
Spruce.....	11,355	293,760	25.87
Basswood.....	11,134	530,082	47.61
Douglas fir.....	10,604	311,638	29.38
Elm.....	9,578	305,104	31.86
Beech.....	3,922	114,348	29.16
Ash.....	3,254	114,228	35.10
Red oak.....	3,161	146,677	46.37
Cypress.....	1,024	77,013	40.03
Sycamore.....	1,802	49,863	27.67
Western pine.....	1,659	26,380	15.90
Hemlock.....	916	32,122	35.07
Magnolia.....	208	2,754	10.28
All other <sup>1</sup> .....	783	28,067	36.00
<b>Imported:</b>			
Mahogany.....	27,628	6,092,375	220.51
Spanish cedar.....	4,771	708,031	148.50
All other <sup>2</sup> .....	27	12,700	470.37

<sup>1</sup> Includes butternut, hackberry, redwood, wahoo, white pine, holly, cherry, willow, chestnut, Port Orford cedar, black gum, and sugar pine.

<sup>2</sup> Includes Circassian walnut and English oak.

Consumption of wood, by method of manufacture (Table 60).—The rotary-cut method, by which a log or bolt mounted on a heavy lathe is turned against a stationary knife, is employed to a greater extent than any other in the manufacture of veneers. In 1919, 83.2 per cent of the wood consumed in the industry was cut by this method, which was used in all of the states reporting. The quantity of materials used for rotary-cut veneers formed the greater part of the total quantity cut into veneers for all states except Alabama, Illinois, Indiana, and New York. In Arkansas,

Oregon, South Carolina, Texas, Vermont, and Virginia this was the only method reported. In 1909, 89.7 per cent of the total quantity of wood consumed in the manufacture of veneers was rotary cut; in 1908, 85.2 per cent; and in 1907, 83.7 per cent.

In 1919 the quantity consumed by the slicing method of manufacturing veneers formed 11.7 per cent of the total quantity used in the industry. This method is somewhat similar to the rotary cut, except that the materials are usually in the form of fitches, which are placed in the veneer machine vertically and forced downward against a stationary knife. Slicing is less wasteful than either sawing or rotary cutting, there being no saw kerf or core.

In Alabama and New York more than one-half of the wood consumed in the manufacture of veneers was sliced. This method was also employed to a great extent in Illinois, Indiana, and Tennessee. Nearly three-fourths of the mahogany and more than one-half of the Spanish cedar and native walnut were sliced.

Sawed veneers are most desirable for certain uses, and more than two-fifths of the white-oak veneers were manufactured by sawing in 1919. This was the only native wood that showed a large percentage of sawed veneers, but a considerable part of the Spanish cedar and Circassian walnut was also cut by this process.

TABLE 60.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY STATES AND BY METHODS: 1919.

STATE.	QUANTITY OF WOOD (M FEET).			
	Total.	Rotary cut.	Sliced.	Sawed.
United States.....	576,581	479,556	67,278	29,747
Arkansas.....	77,096	77,096	.....	.....
Wisconsin.....	50,502	47,804	2,698	.....
Florida.....	43,036	40,631	.....	2,405
Alabama.....	42,342	19,338	21,540	1,464
Mississippi.....	39,061	38,783	.....	278
Tennessee.....	38,805	31,870	4,416	2,600
New York.....	38,571	15,072	21,857	1,642
North Carolina.....	30,423	29,427	853	843
Illinois.....	24,367	10,954	7,177	6,236
Indiana.....	24,254	10,431	3,532	10,291
Kentucky.....	22,071	20,069	1,821	1,081
Missouri.....	18,103	17,882	221	.....
Georgia.....	14,803	14,704	.....	99
Washington.....	14,329	14,304	.....	25
Michigan.....	12,047	12,589	18	90
Maine.....	11,562	11,539	8	15
Louisiana.....	11,407	11,249	.....	158
South Carolina.....	11,151	11,151	.....	.....
Oregon.....	8,704	8,704	.....	.....
Virginia.....	7,521	7,521	.....	.....
Ohio.....	6,042	3,144	1,656	1,242
Texas.....	5,174	5,174	.....	.....
Maryland.....	5,103	3,908	1,105	.....
Vermont.....	4,971	4,971	.....	.....
West Virginia.....	3,478	3,106	178	194
New Jersey.....	1,197	841	.....	356
Pennsylvania.....	1,002	780	10	212
All other states <sup>1</sup> .....	6,840	5,846	683	319

<sup>1</sup> Includes California, Colorado, Delaware, Kansas, Massachusetts, Minnesota, and New Hampshire.

## THE LUMBER INDUSTRY.

## PRODUCTION OF TIGHT AND SLACK COOPERAGE STOCK.

The terms "tight cooperage stock" and "slack cooperage stock" are applied by the trade to staves, heading, and hoops used by coopers in the manufacture or assembling of hogsheads, barrels, kegs, kits, and firkins. Tight cooperage stock pertains to containers for liquids and slack cooperage stock to containers for solids.

This report presents statistics covering the production of tight staves and heading and slack staves, heading, and hoops in the United States during the year 1919, and comparative data for other specified years.<sup>1</sup>

There were 449 establishments in 26 states that reported the manufacture of tight cooperage stock in 1919, while 745 establishments in 33 states reported the manufacture of slack cooperage stock. Frequently an establishment manufacturing staves also reported heading; but, as a rule, staves, heading, and hoops were not produced by the same concern.

## TIGHT COOPERAGE STOCK.

Comparative production of tight staves and heading (Tables 61 and 65).—The total output of the tight cooperage stock industry for 1919 shows an increase of 67,424,000 staves and 3,562,906 sets of heading over the production reported to the Forest Service in 1918, a decrease of 3,373,000 staves and 6,036,078 sets of heading compared with the quantities reported to the Bureau of the Census for 1911, and a decrease of 25,406,000 staves and an increase of 3,582,976 sets of heading when compared with the quantities reported for 1909.

Statistics for tight cooperage stock contain data for staves and heading only. Metal hoops are generally used by the manufacturers of tight containers, while the wooden hoops are, as a rule, used for slack containers.

The stock used in the manufacture of containers for whiskey, wine, beer, and ale is of high grade white oak. The production of this stock has decreased since the prohibition law went into effect, curtailing the domestic demand. On the other hand, oil and tierce, half barrel and keg, and other stock for non-alcoholic containers show considerable increases during the two decades covered by these statistics.

White oak is the principal wood used for the best grade of tight stock, and no substitute quite as valuable has been found. Chiefly on account of the de-

pletion of the supply of oak timber of late years, the use of Douglas fir, spruce, pine, gum, basswood, etc., for tight barrel and keg stock has increased.

Tight staves produced, by classes and by states (Table 62).—Sawed staves are by far the most important numerically of the four classes, forming 98.6 per cent of the total production. Each of the other classes reported less than 1 per cent of the total; but as the best grade of selected white oak is used in the manufacture of such staves, they are of much greater average value per unit.

The total quantity of tight staves reported for 1919 shows an increase of 23.5 per cent over the production of 1918, but a decrease of 0.9 per cent when compared with 1911 and of 6.7 per cent when compared with 1909.

The greatest annual production of tight staves for which records are available was in 1907. The total for that year was 385,232,000 staves, comprising 325,653,000 sawed, 12,737,000 hewed, 25,082,000 bucked and split, and 21,760,000 beer and ale. In 1907, 9 states reported hewed and bucked and split staves and 12 states beer and ale stock. A comparison of these data with the figures presented in Table 62 shows a falling off in the manufacture of tight staves.

Texas led in the production of hewed staves in 1919, Mississippi in 1918, and Louisiana in 1911 and 1909. Mississippi reported the greatest production of bucked and split staves in 1919, and Arkansas in 1918, 1911, and 1909. In the production of beer and ale staves, Arkansas led in 1919, 1918, and 1911, and Kentucky in 1909.

Sawed tight staves produced, by classes and by states (Table 63).—Twenty-six states reported production of sawed tight staves in 1919, 20 in 1918, 27 in 1911, and 31 in 1909. Of the 26 states in 1919, Arkansas alone reported 31.1 per cent of the total production. This state led in the production of all classes of sawed tight staves in 1918 and in most of them in 1919. In 1919, Oregon, however, reported the largest production of half barrel and keg staves and "All other," and Tennessee the largest production of lead staves.

Sawed tight staves produced, by kinds of wood and by classes (Table 64).—White and red oak were the two principal species of wood used in the manufacture of sawed tight staves in both 1918 and 1919. The use of Douglas fir increased greatly in 1919, this wood contributing 14.3 per cent of the total for that year as against 9 per cent in 1918. In 1919, white oak was used exclusively for bourbon staves, but red oak, Douglas fir, and gum were used extensively in the production of oil and tierce and half barrel and keg staves. Nearly one-half of the pork staves were ash.

<sup>1</sup> Similar statistics were compiled by the Forest Service for 1905; by the Bureau of the Census in cooperation with the Forest Service for the years 1906 to 1911, inclusive; and by the Forest Service in cooperation with the Associated Cooperage Industries of America for 1918.

**Tight heading produced, by classes and by states** (Table 66).—Arkansas has led in the production of tight heading for all years for which information is available, contributing 45.6 per cent of the total quantity in 1919. Tennessee ranked second in 1919 and fourth in 1918, producing 14.7 per cent and 11.5 per cent, respectively, of the total output in the United States for those years. In 1918 Louisiana ranked second and Mississippi third.

**Tight heading produced, by kinds of wood and by classes** (Table 67).—White oak is the principal wood used in the manufacture of tight heading. This wood furnished 37.5 per cent of the total tight heading in 1919 and 40.9 per cent in 1918. Red oak ranked second in importance, contributing 24.1 per cent in 1919 and 26.4 per cent in 1918. Douglas fir, which was first mentioned in the annual statistics for 1910, contributed 9.5 per cent of the total output in 1919 and 4.9 per cent in 1918. This wood was used principally for half barrel and keg and oil and tierce heading.

#### SLACK COOPERAGE STOCK.

**Comparative production of slack staves, heading, and hoops** (Table 68).—A comparison of the output of slack cooperage stock in 1919 with that in 1918 shows an increase of 111,353,000 staves and 26,630,000 sets of heading, but a decrease of 191,912,000 hoops. All three classes show decreases when compared with the figures for 1911 and 1909. The banner year for slack staves and heading for which data are available was 1909; while the output for wooden hoops was greatest in 1907, the number reported for that year being 490,570,000 pieces.

Many woods can be used for slack stock which would not be valuable for any other purpose; consequently, considerable timber, not suitable for lumber or tight stock, is utilized by this branch of the industry.

In the production of slack staves, red gum has been the leading species since 1907, with pine ranking second. In 1906, elm held first place, furnishing 248,118,000 staves, while only 61,100,000 elm staves were produced in 1919.

In the case of slack heading, pine has held first place for all years for which records are available, furnishing 48.5 per cent of the total output in 1919; while beech held the second place in 1909, red gum ranked second for the last three years shown in Table 68. In 1919, larch, or tamarack, for the first time, was reported in quantities sufficient to show separately. The decrease in tupelo staves and heading in 1919 as compared with previous years may be partially due to the inclusion of the cut from this wood with that of red gum.

Figures for 1919 show a marked decrease in the output of wooden hoops. This decrease was largely due to conditions affecting timber supply during that year. Elm, because of its tensile qualities, is the wood chiefly used in the manufacture of hoops, but

weather conditions adversely affecting logging operations and competition in other lines made it difficult for hoop manufacturers to secure elm timber.

**Slack staves produced, by kinds of wood and by states** (Table 69).—Arkansas was the leading state in the production of slack staves in 1919, reporting 24.2 per cent of the total. Four other states—Virginia, Missouri, Pennsylvania, and Alabama—each reported more than 50,000,000 staves; and their total output, together with that of Alabama, equaled 703,441,000 staves, or 62.7 per cent of the total for the United States. Statistics for previous years show that Pennsylvania was the leading state in 1906 and 1907; Arkansas in 1908, 1911, and 1918; Michigan in 1909; and Missouri in 1910.

Of the 27 kinds of wood used in the manufacture of slack staves in 1919, red gum furnished 32 per cent and was reported from 11 states; pine furnished 29.2 per cent and was reported from 18 states. Although white oak was reported from 22 states, it furnished only 3.5 per cent of the total. Douglas fir is becoming more important in the manufacture of both tight and slack staves, and an increased production from this kind of wood may be looked for in the future.

**Slack heading produced, by kinds of wood and by states** (Table 70).—The same kinds of wood are largely used in the manufacture of slack staves and heading, practically the same states reporting the two classes of products. The order of their prominence, however, has been somewhat different.

In 1906 Virginia led in the production of slack heading; Michigan in 1907 to 1909, inclusive; Arkansas in 1911; and Alabama in 1918 and 1919. Alabama, Michigan, and Georgia reported 38,536,000 sets of slack heading, or 44.1 per cent of the total in 1919.

**Quantity of hoops produced, by kinds of wood and by states** (Table 71).—Although 21 states reported the manufacture of hoops in 1919, Arkansas, Mississippi, Ohio, Tennessee, Indiana, Michigan, and Missouri furnished more than 92 per cent of the total output. These states have been among the leaders in the production of hoops for many years. Ohio led from 1905 to 1918, furnishing as much as 34.6 per cent of the total in 1907. Arkansas ranked first in 1919, contributing 17.9 per cent of the total. This state held fifth place in 1909 and second in 1918. Mississippi ranked seventh in 1906, third in 1918, and second in 1919.

#### EXPORTS.

The exports of staves and heading are shown in Table 72 for the calendar years 1909 to 1919, inclusive.

The value of staves and heading exported during 1919 was greater than for any previous year. The quantity of staves exported in 1913, however, exceeded the quantity for 1919 by nearly 10,000,000 pieces.

During 1919 the exports to Canada were 26,841,432 staves, valued at \$710,570, an average value of \$26.47 per thousand; to the United Kingdom 13,775,149 staves, valued at \$2,450,085, an average value of \$177.94 per thousand; and to France 10,458,388 staves, valued at \$3,859,664, an average value of \$369.06 per thousand. The exportation to Portugal was 2,337,262 staves and to Netherlands 828,662 staves. The average value of staves exported to

Portugal—\$665.55 per thousand—was the highest for any foreign country.

The class of staves exported is not shown in the statistics. From the average values per thousand it may be inferred, however, that a considerable quantity of staves exported to Canada were slack stock and that the bulk of those exported to Europe were high-grade tight staves.

TABLE 61.—QUANTITY OF TIGHT STAVES PRODUCED, BY CLASSES: 1919, 1918, 1911, AND 1909.

CLASS	TIGHT STAVES PRODUCED (THOUSANDS).				CLASS	TIGHT STAVES PRODUCED (THOUSANDS).			
	1919	1918	1911	1909		1919	1918	1911	1909
Aggregate.....	353,825	286,401	357,198	379,231	Bucked and split, total.....	1,193	1,391	20,020	15,104
Sawed, total.....	348,812	280,171	312,172	341,259	West Indian.....		741	2,381	2,517
Oil and tierce.....	208,776	191,002	140,519	158,457	Spirit and wine.....	295	176	3,076	1,949
Half barrel and keg.....	68,786	28,159	20,030	19,356	Bourbon.....	210	85	9,860	8,332
Spirit and wine.....	20,211	15,690	36,318	38,933	All other.....	688	389	4,703	2,306
Cut-offs.....	9,557	11,145	(1)	14,239	Beer and ale, total.....	551	544	17,819	16,547
Pork.....	10,246	9,366	11,629	13,457	Beer, barrel.....	280		1,679	1,560
Bourbon.....	5,040	950	24,398	11,991	Beer, half barrel.....	85	188	5,599	8,217
All other.....	26,190	23,259	79,278	84,826	Beer, quarter barrel.....	60	124	7,336	5,399
Hewed, total.....	3,269	4,295	7,187	6,321	Beer, sixth barrel.....			256	1,056
Pipe.....	75	2,235	388	825	Beer, eighth barrel.....		82	2,651	2,058
French claret.....	3,143	1,766	5,223	5,320	Ale, hogshead.....	51	150	177	145
All other.....	51	293	1,571	176	All other.....	75		121	112

<sup>1</sup> Included in the figures for "All other."

TABLE 62.—QUANTITY OF TIGHT STAVES PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	TIGHT STAVES PRODUCED (THOUSANDS).					STATE.	TIGHT STAVES PRODUCED (THOUSANDS).				
	Total.	Sawed.	Hewed.	Bucked and split.	Beer and ale.		Total.	Sawed.	Hewed.	Bucked and split.	Beer and ale.
United States.....	353,825	348,812	3,269	1,193	551	New Hampshire.....	19,359	19,359			
Alabama.....	16,183	15,530	653			North Carolina.....	2,764	2,764			
Arkansas.....	109,467	108,551	916	290	295	Ohio.....	2,825	2,825			
California.....	15,026	15,026				Oregon.....	39,132	39,132			
Florida.....	1,238	1,233	5			Tennessee.....	38,854	38,849	5		
Georgia.....	4,368	4,368				Texas.....	4,366	2,891	1,197	152	126
Kentucky.....	21,672	21,842			130	Virginia.....	7,087	7,087			
Louisiana.....	15,693	14,622	1,071			Washington.....	3,448	3,448			
Mississippi.....	23,791	23,033	12	746		West Virginia.....	6,128	6,128			
Missouri.....	15,497	15,497				Wisconsin.....	4,395	4,395			
						All other states <sup>1</sup> .....	2,232	2,232			

<sup>1</sup> Includes Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, South Carolina, and Vermont.

TABLE 63.—QUANTITY OF SAWED TIGHT STAVES PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	SAWED TIGHT STAVES PRODUCED (THOUSANDS).								
	Total.	Oil and tierce.	Half barrel and keg.	Spirit and wine.	Pork.	Cut-offs.	Bourbon.	Lead.	All other.
United States.....	348,812	208,776	68,786	20,211	10,246	9,557	5,040	728	25,468
Alabama.....	15,530	11,985	1,540	485	518	377	325	50	250
Arkansas.....	108,551	75,826	11,692	9,362	2,696	4,443	1,710	250	2,572
California.....	15,026	1,378	12,347	436	728				137
Florida.....	1,233	1,227							6
Georgia.....	4,368	3,909	153	306					
Kentucky.....	21,842	19,843		130		239	1,570		60
Louisiana.....	14,622	12,299	608	707		234			596
Mississippi.....	23,033	21,174	993	162		422			48
Missouri.....	15,497	6,831	5,680	832	1,275	374		100	405
New Hampshire.....	19,359		10,043		1,600				7,816
North Carolina.....	2,764	2,614				15	135		
Ohio.....	2,825	875				1,750			200
Oregon.....	39,132	8,582	20,800		350				9,400
Tennessee.....	38,849	23,150	4,346	5,581	1,945	1,037	1,300	328	1,162
Texas.....	2,801	2,320			562				
Virginia.....	7,087	6,929		30	65	63			
Washington.....	3,448	1,364	40	1,825	185				34
West Virginia.....	6,128	5,943	25	25		105			30
Wisconsin.....	4,395	1,718	400						2,277
All other states <sup>1</sup> .....	2,232	800	119	330		498			485

<sup>1</sup> Includes Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, South Carolina, and Vermont.

TABLE 64.—QUANTITY OF SAWED TIGHT STAVES PRODUCED, BY KINDS OF WOOD AND BY CLASSES: 1919.

CLASS.	SAWED TIGHT STAVES PRODUCED (THOUSANDS).												
	Total.	White oak.	Red oak.	Douglas fir.	Gum.	Pine.	Ash.	Spruce.	Birch.	Bass-wood.	Chest-nut oak.	Maple.	All other. <sup>1</sup>
United States.....	348,812	130,208	80,216	49,045	37,703	10,380	7,408	7,284	3,320	2,600	1,700	1,404	1,398
Oil and tierce.....	208,778	87,000	70,739	10,820	27,006	.....	1,220	.....	1,718	.....	1,602	151	918
Half barrel and keg.....	68,786	11,534	5,800	26,788	6,960	10,050	840	0,309	.....	400	.....	.....	.....
Spirit and wine.....	20,211	16,408	1,050	1,825	.....	.....	430	330	.....	.....	.....	.....	.....
Cut-offs.....	9,557	4,921	2,153	.....	153	.....	33	.....	.....	2,000	49	115	162
Pork.....	10,246	2,022	410	1,078	69	1,500	4,082	.....	.....	.....	.....	.....	185
Bourbon.....	5,040	5,040	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lead.....	728	707	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other.....	25,468	2,000	34	9,434	2,060	7,836	327	449	1,272	200	49	1,138	.....

<sup>1</sup> Includes hemlock, beech, chestnut, cedar, and cypress.

TABLE 65.—QUANTITY OF TIGHT HEADING PRODUCED, BY CLASSES: 1919, 1918, 1911, AND 1909.

CLASS.	TIGHT HEADING PRODUCED (SETS).				CLASS.	TIGHT HEADING PRODUCED (SETS).			
	1919	1918	1911	1909		1919	1918	1911	1909
Aggregate.....	24,274,177	20,711,271	30,310,255	20,691,201	Beer and ale, total.....	8,630	618,017	1,993,703	955,508
Sawed, total.....	24,265,547	20,093,254	28,316,552	19,735,693	Barrel.....	8,630	616,430	311,033	91,050
Oil and tierce.....	13,033,826	13,972,100	11,408,064	9,172,099	Quarter barrel.....	.....	1,108	752,192	(1)
Half barrel and keg.....	6,842,439	3,574,863	4,866,100	1,680,004	Half barrel.....	.....	419	624,390	342,735
Spirit and wine.....	1,214,910	692,527	3,250,891	2,207,596	All other.....	.....	.....	306,088	521,723
Pork.....	500,121	.....	309,759	398,319	.....	.....	.....	.....	.....
Bourbon.....	107,170	469,031	4,487,159	1,289,713	.....	.....	.....	.....	.....
All other.....	2,567,081	1,354,673	3,993,979	4,692,962	.....	.....	.....	.....	.....

<sup>1</sup> Included with "All other."

TABLE 66.—QUANTITY OF TIGHT HEADING PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	TIGHT HEADING PRODUCED (SETS).								
	Total.	Oil and tierce.	Half barrel and keg.	Spirit and wine.	Cut-offs.	Pork.	Bourbon.	All other sawed.	Beer and ale.
United States.....	24,274,177	13,033,826	6,842,439	1,214,910	1,046,675	500,121	107,170	1,520,406	8,630
Alabama.....	72,800	37,800	.....	25,000	10,000	.....	.....	.....	.....
Arkansas.....	11,064,731	5,800,572	4,100,301	541,333	15,000	343,237	80,000	115,288	.....
California.....	1,164,115	240,498	851,857	17,100	.....	47,100	.....	7,500	.....
Georgia.....	595,606	565,980	.....	29,526	.....	.....	.....	.....	.....
Kentucky.....	166,060	66,666	.....	100,000	.....	.....	.....	.....	.....
Louisiana.....	2,034,021	1,412,070	505,000	100,042	4,800	10,900	.....	.....	.....
Maine.....	344,000	.....	.....	.....	.....	.....	.....	344,000	.....
Massachusetts.....	6,000	.....	.....	.....	.....	.....	.....	6,000	.....
Mississippi.....	1,312,425	1,054,455	150,000	25,000	11,875	10,597	.....	60,498	.....
Missouri.....	30,040	40	30,000	.....	.....	.....	.....	.....	.....
New Hampshire.....	1,527,038	.....	.....	.....	1,005,000	.....	.....	522,038	.....
North Carolina.....	117,000	117,000	.....	.....	.....	.....	.....	.....	.....
Oregon.....	1,567,000	420,000	917,000	.....	.....	20,000	.....	210,000	.....
Tennessee.....	3,578,041	3,067,796	181,278	216,174	.....	55,708	18,170	39,915	.....
Texas.....	142,916	123,766	.....	.....	.....	10,510	.....	.....	8,630
Vermont.....	62,408	.....	.....	.....	.....	.....	.....	62,408	.....
Virginia.....	7,669	5,000	.....	.....	.....	2,000	.....	.....	.....
Washington.....	220,318	43,419	19,005	161,135	.....	.....	.....	2,759	.....
West Virginia.....	15,500	.....	.....	.....	.....	.....	.....	.....	.....
Wisconsin.....	246,584	78,080	18,498	.....	.....	.....	.....	150,000	.....

TABLE 67.—QUANTITY OF TIGHT HEADING PRODUCED, BY KINDS OF WOOD AND BY CLASSES: 1919.

CLASS.	TIGHT HEADING PRODUCED (SETS).										
	Total.	White oak.	Red oak.	Gum.	Douglas fir.	Pine.	Spruce.	Ash.	Maple.	Birch.	All other. <sup>1</sup>
United States.....	24,274,177	9,105,577	5,840,447	3,378,792	2,296,339	1,881,066	698,171	586,069	278,700	153,086	54,130
Oil and tierce.....	13,033,826	5,524,701	4,022,734	1,538,632	684,586	4,928	.....	49,128	203,700	78,086	27,331
Spirit and wine.....	1,214,910	942,475	70,000	.....	161,135	.....	17,100	24,200	.....	.....	.....
Bourbon.....	107,170	107,170	.....	.....	.....	.....	.....	.....	.....	.....	.....
Half barrel and keg.....	6,842,439	2,315,081	818,838	1,840,160	1,170,699	.....	611,103	68,000	.....	.....	18,498
Pork.....	500,121	31,408	17,000	.....	67,100	.....	.....	334,553	.....	.....	.....
Cut-offs.....	1,046,675	29,800	11,875	.....	.....	1,005,000	.....	.....	.....	.....	.....
All other sawed.....	1,520,406	96,312	.....	.....	212,759	872,638	60,908	111,088	75,000	75,000	8,301
Beer and ale.....	8,630	8,630	.....	.....	.....	.....	.....	.....	.....	.....	.....

<sup>1</sup> Includes hemlock, 10,331 sets; basswood, 18,498 sets; dogwood, 8,301 sets; and chestnut, 8,000 sets.

TABLE 68.—QUANTITY OF SLACK STAVES, HEADING, AND HOOPS PRODUCED, BY KINDS OF WOOD: 1919, 1918, 1911, AND 1909.

KIND OF WOOD.	SLACK STAVES PRODUCED (THOUSANDS).				SLACK HEADING PRODUCED (THOUSAND SETS).				SLACK HOOPS PRODUCED (THOUSANDS).			
	1919	1918	1911	1909	1919	1918	1911	1909	1919	1918	1911	1909
Total.....	1,121,324	1,009,971	1,328,968	2,029,548	87,381	60,751	106,407	140,234	140,772	332,684	353,215	375,793
Red gum.....	353,405	405,339	338,582	416,570	13,003	12,656	12,558	16,700				
Pine.....	327,875	109,349	229,220	306,621	42,401	26,735	25,513	38,928	(1)			
Elm.....	61,100	83,188	92,614	245,172	1,872	199	2,492	6,535	133,983	330,353	333,297	339,477
Ash.....	53,058	83,022	66,716	71,705	2,318	1,947	7,302	5,245	4,000	54	(1)	(1)
Maple.....	50,446	22,457	66,647	133,255	7,319	2,493	10,794	13,663	(1)			
Oak.....	38,920	15,951	50,043	66,675	1,886	620	5,578	1,963	(1)			
Beech.....	36,460	47,228	121,727	268,237	4,942	5,930	11,915	19,289	(1)			
Chestnut.....	36,303	13,075	71,273	93,290		360	1,177	876	(1)			
Birch.....	35,091	31,758	57,929	78,897	3,490	2,485	4,940	4,328	(1)			
Spruce.....	29,683	3,224	70,189	72,219	2,508	533	3,647	1,861	(1)			
Douglas fir.....	23,822	13,931	(1)	(1)	841	451	(1)	(1)	(1)			
Cottonwood.....	17,511	28,714	37,382	66,260		1,005	2,535	6,742				
Larch, or tamarack.....	14,505											
Tupelo.....	9,206	28,751	37,501	22,500	1,031	2,184	3,891	3,296	(1)			
All other.....	28,339	33,934	89,145	188,147	5,670	3,138	14,065	20,330	2,789	2,277	19,918	36,316

<sup>1</sup> Included with "All other."

TABLE 69.—QUANTITY OF SLACK STAVES PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	SLACK STAVES PRODUCED (THOUSANDS).															
	Total.	Red gum.	Pine.	Elm.	Ash.	Maple.	Oak.	Beech.	Chestnut.	Birch.	Spruce.	Douglas fir.	Cottonwood.	Larch, or tamarack.	Tupelo.	All other. <sup>1</sup>
United States.....	1,121,324	353,405	327,875	61,100	53,058	50,446	38,920	36,460	36,303	35,091	29,683	23,822	17,511	14,505	9,206	28,339
Alabama.....	67,298	300	64,746				2,252									
Arkansas.....	271,060	186,243	2	35,181	36,578	802	513	912				4,891			625	5,312
Florida.....	19,369		19,369													92
Georgia.....	5,645		5,645													1,800
Illinois.....	10,000	7,000		1,000									200			
Louisiana.....	23,607	10,275	3,144	2,140	600		2,891									2,307
Maine.....	39,103		2,995	33	684	1,206	1,465	1,150	20	2,346	22,306		2,250			6,313
Maryland.....	22,391		15,187			250	4,957		1,997							
Massachusetts.....	20,400		16,574			300	1,000	858	457	150	18		1,008			37
Michigan.....	27,862		3,051	4,472	141	9,050	294	1,603		534				7,605		1,112
Minnesota.....	16,109			1,589			1,589							6,900		6,031
Mississippi.....	37,595	24,505	1,320	1,234	491								45			
Missouri.....	101,355	71,521		10,182	12,516	1,400	3,415						1,459		862	
New Hampshire.....	18,896		18,218			15	400		203	20	20					20
New York.....	41,483		183	159	3	18,419	153	6,129		16,225			20			192
North Carolina.....	40,020	23,968	8,962				20		2						7,668	
Ohio.....	5,135			150	1,620		1,737	1,570								8
Oregon.....	13,850					64										
Pennsylvania.....	70,403		1,784	300	25	15,395	3,023	23,945	12,094	13,592	3,128	10,660				235
South Carolina.....	7,522	7,522														
Tennessee.....	30,732	11,561		2,501	100	1,601	5,071	43	83				7,493			2,279
Virginia.....	193,235	5,459	165,932				2,859	18,152							50	786
West Virginia.....	6,033		92	100	300	107	4,804	200	680							300
Wisconsin.....	5,881			1,089		1,639	501			2,224						408
All other states <sup>2</sup> .....	25,033	51	776	970		262	1,865	52	2,615	4,113	13,162	60				1,107

<sup>1</sup> Includes hemlock, basswood, sycamore, hackberry, yellow poplar, cypress, walnut, redwood, cedar, butternut, willow, hickory, and balsam fir.  
<sup>2</sup> Includes California, Delaware, Indiana, Iowa, Kentucky, New Jersey, Texas, Vermont, and Washington.

TABLE 70.—QUANTITY OF SLACK HEADING PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	SLACK HEADING PRODUCED (THOUSAND SETS).													All other. <sup>1</sup>
	Total.	Pine.	Red gum.	Maple.	Beech.	Birch.	Bass-wood.	Spruce.	Ash.	Oak.	Elm.	Tupelo.	Douglas fir.	
United States.....	87,381	42,401	13,003	7,319	4,942	3,490	3,078	2,508	2,318	1,986	1,872	1,031	841	2,592
Alabama.....	23,903	22,217	1,613											
Arkansas.....	3,719	100	2,638						544	190	18	133		
Georgia.....	6,309	6,304										220		
Kentucky.....	976		861				4			85				
Louisiana.....	1,559	161	626									360		
Maine.....	2,749	846			73	21	244	3	1,318	100	11			
Massachusetts.....	1,500	1,404			17	52	62							
Michigan.....	8,204	130		4,074	1,494	1,087	295		4	20	302			
Minnesota.....	2,415	175		200		20	1,001		44	227	227			
Missouri.....	4,360		3,863						507					
New Hampshire.....	2,037	2,012		2				1						
New York.....	2,403	100	44	826	478	643	71	17	20	56	97			
North Carolina.....	4,837	2,052	1,876						500	538	116	309		
Ohio.....	1,100				6									
Oregon.....	804							100		3			701	
Pennsylvania.....	2,848	16		856	1,368	487	16		16	16	16		16	
South Carolina.....	903	903												
Tennessee.....	1,352		823	32	113	40			29	277	10			
Virginia.....	4,854	3,827	441							153		9		
West Virginia.....	1,485	4	2		1,400					3				
Wisconsin.....	4,936			515		905	1,546		486	305	900			
All other states <sup>2</sup> .....	3,138	944	226	124	10	2	82	1,012	59	93	96		124	39

<sup>1</sup> Includes chestnut, cottonwood, hemlock, sycamore, yellow poplar, cypress, redwood, tamarack, willow, cherry, and balsam fir.  
<sup>2</sup> Includes California, Florida, Illinois, Indiana, Maryland, Mississippi, Texas, Vermont, and Washington.

TABLE 71.—QUANTITY OF HOOPS PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	HOOPS PRODUCED (THOUSANDS).		
	Total.	Elm.	All other.
United States.....	140,772	133,983	6,789
Arkansas.....	25,167	24,006	501
Indiana.....	14,847	14,347	
Michigan.....	11,226	11,226	
Mississippi.....	23,853	23,853	
Missouri.....	11,138	11,138	
Ohio.....	23,593	23,593	
Tennessee.....	20,223	20,199	24
All other states <sup>1</sup> .....	11,225	5,021	6,204

<sup>1</sup> Includes Alabama, Florida, Illinois, Kentucky, Maine, Massachusetts, Minnesota, New Hampshire, New York, North Carolina, Oregon, Pennsylvania, Virginia, and Wisconsin.

TABLE 72.—EXPORTS OF STAVES AND HEADING: 1909-1919.  
(Compiled from "Monthly Summary of Foreign Commerce of the United States," Bureau of Foreign and Domestic Commerce, Department of Commerce.)

YEAR.	STAVES.			HEADING.
	Quantity.	Total value.	Average value per thousand.	Value.
1910.....	81,057,792	\$13,100,377	\$161.16	\$591.02
1918.....	53,373,526	3,605,332	67.55	563.56
1917.....	60,005,002	3,688,084	61.47	294.24
1916.....	58,058,710	3,565,142	61.41	239.51
1915.....	51,825,017	3,339,026	65.06	387.48
1914.....	54,048,147	3,835,170	70.96	246.50
1913.....	91,869,115	7,231,934	79.15	325.64
1912.....	73,909,719	6,144,896	83.14	340.98
1911.....	66,097,987	6,005,915	90.96	421.32
1910.....	58,651,374	5,297,466	90.32	291.26
1909.....	47,554,880	4,478,532	94.18	155.57

## GENERAL TABLES.

Comparative statistics, by states.—The number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products, as reported for 1919, 1914, and 1909 for the three branches of the lumber industry combined, are shown in Table 73.

Detailed statement, by states.—The principal gen-

eral statistics secured by the census inquiry for 1911 for the lumber industry are presented by states in Table 74. The table gives statistics for the industry as a whole and for each of the three branches separately.

Custom sawmills.—Table 75 presents detailed statistics for custom sawmills, by states.

TABLE 73.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horse-power.	Expressed in thousands.			STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horse-power.	Expressed in thousands.		
					Wages.	Cost of materials.	Value of products.						Wages.	Cost of materials.	Value of products.
UNITED STATES.															
All branches.....	1919	32,568	610,346	2,922,656	618,207	873,172	2,065,728	Minnesota.....	1919	366	15,485	47,971	12,973	25,889	52,580
	1914	34,244	614,548	2,734,014	320,132	519,019	1,108,550		1914	443	20,719	59,481	10,720	22,380	43,664
	1909	40,671	695,019	2,840,082	318,739	508,118	1,156,129		1909	525	20,704	67,839	10,918	20,865	42,353
LUMBER AND TIMBER PRODUCTS.	1919	26,119	480,945	2,358,937	489,419	470,960	1,387,471	Mississippi.....	1919	1,504	37,435	139,851	32,431	30,450	94,501
	1914	27,229	479,790	2,192,392	61,949	184,227	307,673		1914	1,296	29,640	125,371	12,414	14,856	38,538
	1909	33,090	547,178	2,310,634	238,867	205,560	753,388		1909	1,647	33,397	149,715	12,583	14,207	42,793
LUMBER, PLANING-MILL PRODUCTS.	1919	5,309	86,956	419,671	91,977	299,266	500,433	Missouri.....	1919	697	10,095	39,465	8,409	15,896	33,655
	1914	5,841	90,214	414,817	61,949	184,227	307,673		1914	943	9,097	43,827	4,679	8,321	18,166
	1909	6,402	112,392	410,950	64,536	196,080	327,398		1909	1,098	13,522	49,506	5,897	10,614	23,261
BOXES, WOODEN PACKING.	1919	1,140	42,445	144,048	36,811	102,946	177,819	Montana.....	1919 <sup>2</sup>	183	3,869	17,220	4,930	3,957	12,197
	1914	1,174	38,548	126,805	18,206	52,840	86,567		1914	164	2,965	20,978	2,270	2,356	6,720
	1909	1,179	35,449	112,498	15,336	46,478	75,343		1909	155	3,106	14,337	2,155	1,865	6,334
STATES.															
Alabama.....	1919	1,774	27,097	116,724	20,992	20,028	61,817	New Hampshire.....	1919	392	7,131	37,437	6,949	11,654	24,210
	1914	1,421	22,750	91,384	7,816	9,400	24,314		1914	513	7,264	45,273	3,842	8,417	16,519
	1909	1,819	22,409	102,527	7,269	9,145	26,058		1909	589	8,494	44,593	3,924	7,263	15,284
Arizona.....	1919	26	1,039	3,609	1,246	844	2,679	New Jersey.....	1919	368	4,105	16,800	4,615	13,407	22,002
	1914	28	1,155	3,126	826	542	1,634		1914	378	4,872	17,432	2,851	7,374	12,433
	1909	23	839	2,963	639	337	1,419		1909	416	4,857	15,760	2,631	8,010	13,611
Arkansas.....	1919	1,562	31,884	135,463	28,787	32,449	91,852	New Mexico.....	1919	56	1,268	4,413	1,167	758	2,971
	1914	1,249	29,560	123,796	14,010	13,061	42,844		1914	60	842	3,109	379	491	1,644
	1909	1,697	32,932	122,387	13,060	14,300	40,640		1909	76	1,475	4,835	714	578	2,162
California.....	1919	566	24,829	109,817	32,432	44,512	99,052	New York.....	1919	1,526	16,721	99,878	17,777	44,076	82,508
	1914	616	22,352	105,516	17,091	25,618	52,812		1914	1,763	21,037	114,540	12,535	32,478	58,795
	1909	644	22,935	94,914	15,651	18,369	45,000		1909	2,263	27,471	131,462	15,101	41,705	72,530
Colorado.....	1919	181	1,294	7,983	1,616	1,509	4,197	North Carolina.....	1919	2,957	25,847	128,241	22,021	25,011	69,554
	1914	218	1,327	8,234	971	939	2,489		1914	2,952	34,374	140,388	12,555	16,320	33,631
	1909	263	2,190	11,177	1,458	1,396	4,185		1909	2,544	34,001	115,542	9,707	12,534	33,525
Connecticut.....	1919	292	1,773	12,235	1,967	5,451	10,144	Ohio.....	1919	990	9,504	55,849	10,041	30,901	53,397
	1914	292	2,338	12,450	1,448	3,749	8,917		1914	1,169	11,711	60,650	6,950	17,808	31,292
	1909	303	3,495	15,153	1,907	3,918	7,846		1909	1,390	13,456	69,255	6,701	19,972	34,597
Delaware.....	1919	90	701	3,393	477	731	1,716	Oklahoma.....	1919 <sup>1</sup>	201	2,493	10,682	2,543	2,914	8,054
	1914	102	786	3,237	253	345	828		1914	284	3,151	12,799	1,309	1,686	4,113
	1909	116	1,174	3,787	330	608	1,312		1909	342	3,775	12,397	1,269	1,487	4,439
Dist. Columbia.....	1919	9	244	643	295	382	860	Oregon.....	1919	706	24,578	173,178	34,427	37,524	95,284
	1914	10	249	679	162	194	441		1914	524	13,888	101,824	9,942	14,397	30,916
	1909	10	309	501	189	254	609		1909	713	15,066	95,213	10,172	12,413	30,200
Florida.....	1919	552	23,850	75,228	18,427	17,776	50,409	Pennsylvania.....	1919	1,935	16,295	86,128	16,947	31,539	67,713
	1914	507	18,358	65,073	8,076	9,728	21,458		1914	2,333	21,153	97,994	11,534	24,009	49,499
	1909	515	19,227	65,097	7,551	6,239	20,863		1909	2,667	26,873	113,412	13,558	27,314	57,454
Georgia.....	1919	1,656	16,341	73,970	12,632	18,372	43,051	Rhode Island.....	1919	63	706	3,918	753	1,457	2,977
	1914	1,588	18,196	74,640	6,740	9,312	22,115		1914	52	772	3,038	485	1,082	2,081
	1909	1,826	22,257	83,464	7,305	8,505	24,632		1909	57	748	2,328	437	1,064	1,907
Idaho.....	1919	213	8,431	47,892	11,786	8,908	30,785	South Carolina.....	1919	670	12,732	51,905	10,387	9,268	26,694
	1914	159	6,019	34,936	4,912	6,103	13,326		1914	793	11,308	49,531	4,121	3,853	11,658
	1909	256	5,212	32,342	3,382	3,346	10,689		1909	851	14,604	49,400	4,378	3,981	13,141
Illinois.....	1919	495	11,237	42,286	12,349	34,016	69,775	South Dakota.....	1919	73	820	3,732	883	1,006	2,632
	1914	594	14,734	45,479	9,552	23,907	41,503		1914	51	281	2,358	211	455	860
	1909	814	16,567	52,015	9,110	27,264	44,952		1909	58	451	2,260	301	349	945
Indiana.....	1919	736	7,300	44,667	6,615	18,800	35,043	Tennessee.....	1919	1,570	16,314	74,267	12,269	22,773	52,788
	1914	903	7,618	45,153	4,001	11,590	20,995		1914	1,968	18,084	83,133	6,750	14,391	30,692
	1909	1,277	10,317	57,243	4,492	12,382	23,135		1909	1,977	22,389	83,382	6,986	13,641	30,457
Iowa.....	1919	144	3,549	11,680	3,149	9,593	17,893	Texas.....	1919	606	20,239	87,528	20,391	22,570	61,105
	1914	141	3,302	10,147	2,101	6,713	11,426		1914	576	19,906	73,634	10,573	11,581	28,608
	1909	229	4,668	16,564	2,366	7,141	12,659		1909	799	23,518	88,031	11,602	11,004	32,201
Kansas.....	1919	59	799	2,920	775	2,267	3,933	Utah.....	1919 <sup>1</sup>	113	366	4,184	466	481	1,338
	1914	60	758	2,939	490	1,375	2,429		1914	129	745	3,835	582	561	1,503
	1909	73	982	2,947	540	2,072	3,244		1909	104	431	2,922	306	435	977
Kentucky.....	1919	1,045	9,980	44,583	8,131	15,999	33,836	Vermont.....	1919	457	3,948	34,118	3,355	5,915	13,142
	1914	1,295	13,127	54,597	4,662	10,041	20,074		1914	509	4,098	38,956	2,096	3,956	8,711
	1909	1,592	13,042	60,653	4,382	10,456	21,381		1909	593	4,790	41,937	2,013	4,131	8,598
Louisiana.....	1919	879	44,526	161,111	44,524	42,895	130,640	Virginia.....	1919	2,110	20,533	81,751	17,121	24,228	56,393
	1914	513	44,413	164,381	23,643	27,716	66,647		1914	2,216	26,305	85,747	9,621	13,362	32,443
	1909	702	46,072	150,286	20,033	23,156	62,838		1909	2,617	33,287	99,474	9,962	13,892	35,855
Maine.....	1919	712	11,492	68,942	10,943	15,128	36,389	Washington.....	1919	1,232	56,018	436,365	83,673	93,103	234,825
	1914	940	14,906	81,509	7,543	12,679	26,282		1914	933	38,072	265,797	29,331	38,467	83,515
	1909	1,065	15,080	95,963	7,103	10,930	26,125		1909	1,263	43,749	224,455	31,327	36,879	89,155
Maryland.....	1919	497	4,905	24,347	3,947	9,704	18,636	West Virginia.....	1919	773	13,665	48,441	15,374	16,931	40,314
	1914	490	6,016	22,724	2,683	6,066	11,723		1914	955	17,417	68,045	9,703	9,583	28,995
	1909	561	7,003	23,553	2,457</										

TABLE 74.—DETAILED STATEMENT FOR THE

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.							WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Capital.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			10 and over.		Under 16.		
					Male.	Female.	Average number.	Number, 15th day of—		Male.	Female.	Male.	Female.	
								Maximum month.	Minimum month.					

ALL BRANCHES.

																	Dollars.
1	United States.....	32,568	692,166	36,027	22,197	16,395	6,601	610,340	De 690,451	Fe 543,875	770,530	756,545	12,025	1,816	153		1,828,772,648
2	Alabama.....	1,774	30,928	2,330	982	400	119	27,097	De 33,878	My 23,753	36,447	36,183	206	53	5		47,200,859
3	Arizona.....	26	1,121	23	29	19	11	1,039	Au 1,291	Ma 621	1,119	1,114	5				3,195,957
4	Arkansas.....	1,562	35,826	1,854	1,097	782	209	31,884	Se 37,827	Mh 27,114	41,434	40,953	441	34	6		80,518,740
5	California.....	566	27,410	408	715	1,017	381	24,829	Jy 29,292	Fe 17,673	28,490	27,686	750	50	4		108,993,898
6	Colorado.....	181	1,621	178	82	55	12	1,294	Jy 1,600	Mh 851	1,750	1,723	34	2			3,903,053
7	Connecticut.....	292	2,353	306	124	81	69	1,773	De 2,061	Fe 1,493	2,360	2,353	9	4			6,920,910
8	Delaware.....	90	845	100	27	12	5	701	Se 874	Se 578	995	988	4	3			1,035,570
9	District of Columbia.....	9	279	5	19	8	3	244	Jy 263	Ja 227	258	253	4	1			571,787
10	Florida.....	552	25,117	598	698	416	85	23,350	Oc 25,614	Fe 21,102	26,008	26,089	468	51			46,760,804
11	Georgia.....	1,650	19,928	2,034	663	325	65	16,841	De 22,288	Fe 13,695	25,101	24,726	322	50	3		28,976,963
12	Idaho.....	213	9,141	227	101	260	62	8,431	Se 9,987	Ja 6,330	9,767	9,668	87	12			49,824,847
13	Illinois.....	495	13,189	408	653	575	266	11,287	De 12,475	Jy 10,150	12,783	11,900	747	74	2		38,490,284
14	Indiana.....	736	9,135	770	505	262	178	7,300	De 8,930	Ja 6,239	9,136	8,742	305	82	7		24,463,504
15	Iowa.....	144	4,362	122	195	350	146	3,549	No 3,588	Ja 2,770	4,032	3,855	147	20	1		13,820,221
16	Kansas.....	50	935	60	28	35	13	790	Oc 894	Fe 685	852	804	48				1,942,741
17	Kentucky.....	1,045	12,094	1,243	432	298	141	9,980	No 11,995	Ja 8,680	11,259	10,920	293	40	0		23,758,794
18	Louisiana.....	579	47,775	430	1,195	1,229	395	44,526	Au 48,478	Ja 39,810	50,506	50,138	318	50			137,249,904
19	Maine.....	712	13,017	772	366	254	133	11,492	No 13,603	Ap 9,909	15,684	15,477	197	8	2		35,923,331
20	Maryland.....	497	6,026	553	251	171	56	4,995	Se 5,954	Se 4,681	6,755	6,470	241	44			12,161,731
21	Massachusetts.....	465	8,191	415	300	175	182	7,059	De 7,787	Je 6,527	8,128	7,500	403	102	24		21,767,431
22	Michigan.....	618	24,223	607	821	709	426	21,600	De 24,087	Ap 19,051	25,744	24,921	733	90			77,656,791
23	Minnesota.....	366	16,890	366	388	474	147	15,485	De 18,642	Jy 12,497	21,209	20,940	207	61	1		49,493,411
24	Mississippi.....	1,504	41,344	1,926	1,061	695	227	37,435	De 42,991	Ap 32,797	47,714	47,288	318	99	9		91,980,311
25	Missouri.....	697	11,899	812	481	382	129	10,005	De 11,754	Fe 8,418	12,663	12,203	349	105	9		24,820,339
26	Montana.....	183	4,340	214	88	148	21	3,869	No 4,263	Ap 3,279	5,193	5,174	18	1			14,516,653
27	Nebraska.....	39	630	26	38	22	18	526	No 592	Mh 463	581	579	2				1,697,361
28	New Hampshire.....	363	7,911	439	186	90	74	7,131	No 8,547	Jy 5,148	9,574	9,375	180	13			20,961,484
29	New Jersey.....	368	4,948	352	234	147	110	4,105	No 4,454	Fe 3,804	4,805	4,449	116	27	13		14,435,559
30	New Mexico.....	56	1,426	47	48	40	6	1,286	No 1,493	Ja 944	1,798	1,785	9	4			2,879,311
31	New York.....	1,526	20,073	1,601	1,107	814	430	16,721	De 18,949	Ja 14,878	20,675	20,358	262	54	1		72,773,161
32	North Carolina.....	2,957	31,081	3,629	1,994	371	140	25,847	De 35,490	Fe 20,336	39,806	39,542	156	105	3		73,309,066
33	Ohio.....	990	12,649	1,640	720	493	262	9,504	De 16,563	Ja 8,520	11,634	11,431	192	11			32,746,777
34	Oklahoma.....	201	2,941	218	123	82	25	2,493	De 2,925	Fe 2,166	3,146	3,142	1	3			5,550,491
35	Oregon.....	796	26,843	766	624	650	225	24,578	Au 29,834	Ja 17,164	29,113	28,465	623	24	1		88,870,116
36	Pennsylvania.....	1,935	20,473	2,401	912	553	312	16,295	De 18,294	Ap 14,070	20,205	19,904	209	90	2		59,379,781
37	Rhode Island.....	63	842	58	38	24	16	706	De 805	Fe 590	854	842		12			2,094,031
38	South Carolina.....	670	14,200	780	428	194	66	12,732	De 16,026	My 9,731	18,425	18,342	58	25			29,485,221
39	South Dakota.....	73	945	66	24	24	11	820	De 1,009	Ap 693	1,071	1,064	6	1			1,044,861
40	Tennessee.....	1,570	19,672	2,019	704	480	155	16,314	De 20,407	Fe 13,045	23,160	22,568	530	68	4		69,795,541
41	Texas.....	606	22,428	602	670	771	186	20,239	De 23,007	Ja 17,842	24,286	24,024	230	31			56,437,421
42	Utah.....	113	579	175	21	17		366	Se 486	Fe 250	741	728	9	4			813,221
43	Vermont.....	457	4,684	532	123	47	34	3,948	De 4,423	Jy 3,249	5,441	5,270	143	28			11,029,281
44	Virginia.....	2,110	24,299	2,562	647	405	162	20,593	De 25,957	Fe 17,399	30,366	29,689	598	75	7		40,856,251
45	Washington.....	1,232	60,088	1,119	1,508	1,057	386	56,018	Oc 64,975	Ja 40,388	66,228	65,379	825	20	4		167,809,241
46	West Virginia.....	773	15,313	883	453	190	122	13,665	De 14,870	Fe 11,973	16,413	16,317	72	24			40,789,681
47	Wisconsin.....	605	31,363	475	963	749	354	28,822	De 33,814	My 26,313	35,361	34,016	1,145	161	39		87,297,731
48	Wyoming.....	83	475	84	20	7	3	361	Jy 396	Ja 312	537	537					1,239,711
49	All other states <sup>1</sup> .....	21	434	11	31	36	4	352	Se 523	Ja 180	518	515	2	1			1,150,501

<sup>1</sup>Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).  
<sup>2</sup>Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).



TABLE 74.—DETAILED STATEMENT FOR THE

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.							WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Capital.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number, 15th day of—			Male.	Female.	Male.		Female.
								Maximum month.	Minimum month.						

LUMBER AND TIMBER PRODUCTS.

1	United States.....	26, 119	538, 788	31, 348	13, 300	9, 800	3, 200	480, 045	Do 548,055	Ja 427, 802	620, 472	620, 267	5, 280	864	61	Dollars.
2	Alabama.....	1, 085	29, 344	2, 235	874	354	103	25, 778	Do 32, 439	My 22, 461	34, 020	34, 711	103	50	5	44, 307, 851
3	Arizona.....	18	1, 039	17	23	17	10	972	Au 1, 205	Mh 568	1, 047	1, 042	5	.....	.....	2, 947, 503
4	Arkansas.....	1, 606	34, 154	1, 706	1, 011	734	184	30, 429	So 36, 289	Mh 25, 798	39, 757	39, 815	403	28	6	75, 974, 346
5	California.....	195	18, 150	169	338	493	193	16, 957	Jy 20, 097	Ja 11, 023	19, 445	18, 042	471	32	.....	75, 530, 087
6	Colorado.....	136	1, 059	152	48	29	7	823	Jy 1, 008	Mh 439	1, 237	1, 212	24	1	.....	2, 885, 858
7	Connecticut.....	189	948	214	22	9	9	694	Do 858	Jy 495	1, 158	1, 152	4	2	.....	1, 199, 802
8	Delaware.....	75	530	94	8	6	2	420	Do 573	Jo 317	691	688	.....	.....	.....	531, 161
9	Florida.....	409	22, 632	603	547	359	65	21, 058	So 23, 193	Fe 18, 872	24, 092	23, 792	284	46	.....	41, 636, 709
10	Georgia.....	1, 512	15, 021	1, 803	430	170	34	13, 375	Do 18, 554	Fe 10, 094	21, 390	21, 210	120	48	8	18, 918, 831
11	Idaho.....	194	8, 964	210	153	252	68	8, 201	So 9, 822	Ja 6, 237	9, 620	9, 534	86	9	.....	49, 347, 384
12	Illinois.....	163	1, 049	187	78	45	23	1, 610	Do 2, 100	Ap 1, 240	2, 457	2, 315	141	1	.....	5, 428, 864
13	Indiana.....	486	6, 170	594	227	107	69	4, 173	Do 4, 905	Ja 3, 541	5, 494	5, 417	65	12	.....	12, 006, 744
14	Iowa.....	32	200	31	13	10	3	203	So 234	Au 1, 479	2, 258	2, 257	.....	.....	.....	558, 218
15	Kentucky.....	931	9, 340	1, 159	233	156	76	7, 710	No 9, 025	Ja 6, 402	8, 892	8, 688	178	20	.....	16, 655, 212
16	Louisiana.....	511	45, 107	390	1, 058	1, 109	350	42, 194	Au 40, 041	Ja 37, 502	47, 006	47, 487	91	28	.....	130, 463, 617
17	Maine.....	927	11, 066	694	280	206	92	9, 704	No 11, 423	Jy 8, 278	13, 665	13, 548	112	4	1	29, 743, 391
18	Maryland.....	393	2, 402	474	50	25	9	1, 844	Do 2, 714	Au 1, 450	3, 390	3, 335	3	22	.....	3, 205, 763
19	Massachusetts.....	244	1, 013	260	49	12	10	1, 582	Mh 1, 837	Jy 1, 332	1, 998	1, 979	.....	.....	.....	4, 068, 302
20	Michigan.....	380	16, 139	410	363	317	129	14, 923	Fe 16, 575	Ja 13, 649	18, 170	17, 927	221	22	.....	49, 093, 440
21	Minnesota.....	244	13, 384	261	182	278	61	12, 602	Fe 15, 810	My 9, 753	17, 877	17, 713	152	11	1	38, 601, 513
22	Mississippi.....	1, 435	39, 131	1, 854	937	641	137	35, 512	Do 40, 842	Ap 31, 042	45, 533	45, 204	226	94	9	87, 841, 016
23	Missouri.....	557	6, 393	725	191	133	31	5, 283	Do 6, 802	Ja 4, 119	7, 715	7, 638	51	24	2	9, 737, 292
24	Montana.....	153	4, 107	182	75	141	16	3, 693	No 4, 071	Ap 3, 128	5, 000	4, 983	16	1	.....	12, 983, 377
25	Nebraska.....	4	9	.....	.....	.....	.....	5	No 12	Ja 3	20	20	.....	.....	.....	5, 790
26	New Hampshire.....	327	5, 527	377	100	37	31	4, 970	No 6, 174	Jy 3, 091	7, 110	7, 088	14	8	.....	13, 898, 556
27	New Jersey.....	164	1, 197	189	25	15	10	958	Do 1, 122	Ja 875	1, 241	1, 149	76	0	10	2, 201, 247
28	New Mexico.....	47	1, 367	40	44	40	3	1, 240	No 1, 441	Ja 907	1, 742	1, 729	9	4	.....	2, 737, 337
29	New York.....	849	6, 894	1, 023	194	133	50	5, 404	Do 6, 800	Jy 4, 060	7, 884	7, 843	38	3	.....	22, 075, 821
30	North Carolina.....	2, 762	27, 403	3, 465	805	298	107	22, 728	Do 32, 184	Ja 17, 228	30, 419	30, 289	81	49	.....	64, 786, 349
31	Ohio.....	514	4, 039	663	149	54	48	3, 135	Do 3, 543	Ja 2, 850	4, 120	4, 109	14	6	.....	6, 697, 051
32	Oklahoma.....	145	2, 224	174	61	33	9	1, 047	Do 2, 309	Jo 1, 566	2, 504	2, 501	.....	.....	.....	3, 068, 782
33	Oregon.....	625	24, 876	701	524	370	197	22, 884	Au 27, 097	Ja 15, 787	27, 294	26, 780	403	21	.....	83, 482, 424
34	Pennsylvania.....	1, 334	9, 928	1, 778	211	161	75	7, 703	Do 8, 807	Jy 6, 097	10, 807	10, 752	40	15	.....	20, 263, 681
35	Rhode Island.....	23	97	26	.....	.....	.....	71	Mh 100	Jy 34	144	144	.....	.....	.....	156, 127
36	South Carolina.....	610	12, 973	729	328	155	48	11, 713	Do 15, 594	My 8, 717	17, 405	17, 337	44	24	.....	27, 207, 614
37	South Dakota.....	45	748	44	12	13	6	673	Do 855	Ap 520	914	910	.....	.....	.....	1, 276, 731
38	Tennessee.....	1, 450	15, 699	1, 929	480	343	100	12, 847	Do 16, 590	Fe 9, 997	19, 278	19, 113	122	43	.....	59, 885, 298
39	Texas.....	457	19, 041	430	502	606	144	17, 359	Do 20, 023	Ja 15, 285	21, 135	21, 078	37	20	.....	47, 282, 312
40	Utah.....	80	316	148	1	.....	.....	106	Jy 200	Fe 95	489	470	9	4	.....	369, 822
41	Vermont.....	409	3, 619	473	86	25	15	3, 020	Do 3, 403	Jy 2, 295	4, 460	4, 359	72	28	.....	6, 997, 765
42	Virginia.....	1, 931	19, 131	2, 431	886	261	93	15, 960	Do 21, 081	Fe 13, 165	25, 364	25, 215	100	49	.....	25, 576, 816
43	Washington.....	1, 130	57, 115	1, 055	1, 868	903	336	53, 393	Do 61, 910	Ja 38, 318	63, 293	62, 541	689	12	1	159, 411, 073
44	West Virginia.....	643	13, 090	775	313	90	85	12, 427	Do 13, 499	Fe 10, 880	15, 935	14, 967	58	10	.....	33, 446, 412
45	Wisconsin.....	372	23, 264	318	539	422	190	21, 795	Do 26, 195	Jy 18, 827	27, 701	26, 994	608	70	23	60, 683, 631
46	Wyoming.....	58	410	64	17	4	8	322	Jy 351	Ja 285	485	485	.....	.....	.....	1, 119, 494
47	All other states.....	5	246	2	16	33	1	197	Au 367	Ja 49	320	320	.....	.....	.....	728, 828

1 Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).  
 2 Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).  
 3 None reported for one or more other months.



TABLE 74.—DETAILED STATEMENT, FOR THE

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.							WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Capital.	
		Total.	Pre- pri- tors and firm mem- bers.	Salar- ied offi- cers, super- in- tend- ents, and man- agers.	Clerks, etc.		Wage earners.		Total.	16 and over.		Under 16.			
					Male.	Fe- male.	Aver- age num- ber.	Number, 15th day of—		Male.	Fe- male.	Male.	Fe- male.		
								Maximum month.							Minimum month.

LUMBER, PLANING-MILL PRODUCTS.

	5,309	100,481	4,430	6,705	5,611	2,689	86,956	No 97,035	Fe 74,362	97,740	95,008	2,163	459	20	Dollars. 861,848,079
1 United States.....															
2 Alabama.....	82	1,272	94	92	42	16	1,028	No 1,231	Fe 829	1,232	1,214	15	3		2,430,795
3 Arizona.....	8	82	6	6	2	1	67	No 86	Fe 51	72	72				248,454
4 Arkansas.....	50	1,431	50	74	47	21	1,233	De 1,425	Jy 977	1,444	1,410	20	5		4,242,438
5 California.....	325	7,380	271	290	450	160	6,215	De 7,121	Fe 5,262	7,175	7,059	104	11	1	25,726,580
6 Colorado.....	41	489	24	27	23	4	411	No 400	Fe 346	405	404				867,085
7 Connecticut.....	91	1,342	79	90	72	58	1,037	De 1,161	Fe 889	1,104	1,158	5	1		5,565,761
8 Delaware.....	8	61	4	4	1	1	51	No 80	Fe 26	57	57				109,120
9 District of Columbia.....	0	279	5	19	8	3	244	Jy 263	Ja 227	258	258	4	1		571,767
10 Florida.....	63	1,472	51	94	42	18	1,267	No 1,462	Ap 1,085	1,431	1,427	3	1		3,374,359
11 Georgia.....	131	3,176	125	189	140	28	2,688	De 2,880	Fe 2,300	2,840	2,806	43			8,917,601
12 Idaho.....	16	152	10	0	8	3	110	Au 155	Ja 84	112	108	1	3		415,852
13 Illinois.....	269	6,320	170	414	408	175	5,147	No 5,786	Fe 4,216	5,063	5,518	90	49		24,059,331
14 Indiana.....	222	2,961	158	298	120	80	2,238	No 2,523	Ja 1,777	2,525	2,427	60	33		10,522,784
15 Iowa.....	97	3,934	70	171	330	140	3,211	No 3,633	Ja 2,451	3,039	3,471	144	23	1	12,968,813
16 Kansas.....	56	550	57	24	27	12	436	Oc 482	Ja 388	465	460	5			1,160,352
17 Kentucky.....	106	2,209	84	175	130	56	1,704	So 1,943	Ja 1,433	1,871	1,828	44	3	1	6,246,851
18 Louisiana.....	51	1,270	24	87	80	32	1,050	Oc 1,108	Ja 911	1,139	1,131	1	7		4,362,736
19 Maine.....	50	918	58	40	25	15	780	No 909	Mh 566	806	777	27	1	1	3,555,153
20 Maryland.....	65	1,493	50	109	117	38	1,170	No 1,270	Ja 1,050	1,283	1,219	53	11		5,336,640
21 Massachusetts.....	146	2,728	107	177	111	88	2,245	De 2,614	Ja 1,900	2,613	2,576	8	20		8,410,880
22 Michigan.....	192	6,434	153	380	372	273	5,256	De 5,953	Ja 4,251	5,833	5,454	332	47		24,835,940
23 Minnesota.....	94	2,689	78	165	180	78	2,188	De 2,590	Ja 1,556	2,578	2,537	20	21		8,994,879
24 Mississippi.....	65	1,341	72	92	40	29	1,102	De 1,213	Ja 970	1,245	1,238	2	5		2,746,400
25 Missouri.....	111	3,435	73	188	206	73	2,895	No 3,115	Ja 2,512	3,114	2,972	80	51	5	10,629,103
26 Montana.....	30	233	32	18	7	5	170	Au 213	Mh 120	193	191	2			1,532,620
27 Nebraska.....	20	510	19	33	19	17	422	No 475	Mh 363	455	453	2			1,325,202
28 New Hampshire.....	33	602	34	15	15	14	524	De 631	Ap 451	620	621	4	4		1,573,972
29 New Jersey.....	168	2,416	129	165	99	73	1,950	No 2,147	Fe 1,665	2,151	2,119	27	2	3	8,484,086
30 New Mexico.....	9	59	7	4		2	46	De 56	Ja 37	50	56				141,980
31 New York.....	515	10,505	412	744	570	318	8,455	De 9,659	Ja 7,096	9,753	9,664	84	5		41,284,718
32 North Carolina.....	108	2,654	149	223	64	21	2,197	De 2,360	Ja 2,061	2,370	2,374	1	4		6,736,100
33 Ohio.....	378	5,862	288	472	390	217	4,405	De 5,021	Ja 3,730	5,497	5,430	50	2		21,702,084
34 Oklahoma.....	56	717	44	62	49	16	540	So 605	Ja 394	642	641	1			1,981,625
35 Oregon.....	61	1,305	51	76	68	26	1,084	Au 1,311	Ja 794	1,220	1,157	70	1	1	3,908,674
36 Pennsylvania.....	538	8,927	595	590	365	210	7,191	No 7,984	Mh 6,275	7,830	7,657	144	33	2	33,691,033
37 Rhode Island.....	27	470	22	28	21	11	388	So 437	Fe 328	435	424		11		1,159,705
38 South Carolina.....	54	1,053	49	86	37	16	865	Au 914	Fe 702	856	853	2	1		2,041,790
39 South Dakota.....	28	197	22	12	11	5	147	Jc 150	Fe 127	157	154	2	1		666,136
40 Tennessee.....	109	3,178	82	188	124	47	2,737	De 3,050	Fe 2,370	3,076	2,700	340	13	4	8,706,959
41 Texas.....	130	2,205	120	128	149	34	1,770	Oc 2,030	Fe 1,524	1,958	1,948	4	6		6,906,979
42 Utah.....	33	263	27	20	10		200	De 252	Ja 153	252	252				508,400
43 Vermont.....	35	445	47	17	21	11	349	Jy 386	Ja 288	373	373				2,005,939
44 Virginia.....	145	2,470	123	170	109	30	2,030	No 2,269	Ja 1,736	2,272	2,263	16	3		7,357,741
45 Washington.....	86	2,244	90	115	81	42	1,946	No 2,340	Fe 1,445	2,332	2,229	103			6,377,101
46 West Virginia.....	121	1,419	102	130	97	30	1,054	De 1,162	Fe 941	1,167	1,150	3	14		6,866,515
47 Wisconsin.....	107	5,220	121	288	278	117	4,422	No 4,907	Ja 3,838	4,898	4,630	213	54	1	19,826,912
48 Wyoming.....	25	65	20	8	8		36	Oc 51	Fe 26	52	52				120,308
49 All other states <sup>1</sup> .....	11	71	8	6	2	1	54	So 64	Fe 44	50	50				235,716

<sup>1</sup> Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).  
<sup>2</sup> Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

LUMBER INDUSTRY, BY STATES: 1919—Continued.

EXPENSES.										Value of products.	Value added by manufacture.	POWER.					
Salaries and wages.			For contract work.	Rent and taxes.		For materials.		Total.	Primary horsepower.								
Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.		Owned.			Electric horsepower generated in establishments reporting.					

LUMBER, PLANING-MILL PRODUCTS.

Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	419,671	222,953	12,006	15,283	4,633	164,796	37,499	
233,003	69,331	859,976	33,668	13,446	30,560	3,847,288	13,867	5,702,022	1,840,867	5,313	4,500	175	35	55	548	563	1	
11,911	3,160	88,116	.....	496	2,557	211,899	4,118	364,301	148,284	246	.....	.....	.....	.....	216	.....	2	
258,075	90,974	1,090,271	6,225	9,850	110,335	4,620,034	23,251	7,064,791	2,421,500	4,358	3,289	18	177	.....	874	308	3	
819,007	693,074	7,935,119	22,721	138,434	309,995	27,894,366	321,823	42,832,201	14,616,012	34,246	13,184	590	227	45	20,200	4,090	4	
50,327	31,500	512,066	600	8,130	17,108	734,021	19,076	1,572,132	819,035	1,734	681	40	.....	.....	1,013	.....	5	
262,866	136,928	1,208,023	2,304	44,000	146,851	4,469,873	101,861	7,478,358	2,906,624	6,279	3,242	.....	127	70	2,840	27	7	
16,500	1,765	41,368	.....	440	915	94,564	5,319	183,624	83,741	301	145	.....	20	.....	136	.....	8	
34,587	14,699	295,365	2,000	11,140	8,220	369,313	12,958	860,389	478,118	643	340	.....	25	.....	278	.....	9	
210,835	70,538	1,096,494	245	16,032	74,611	3,090,569	26,621	5,270,931	2,153,741	5,155	3,705	.....	107	.....	1,343	60	10	
489,069	223,379	2,210,342	91,305	26,810	178,352	8,361,802	110,657	14,029,180	5,557,221	12,500	9,445	65	273	105	2,612	25	11	
16,570	11,725	133,235	.....	2,725	4,400	331,692	5,657	555,343	217,994	557	315	.....	.....	.....	242	175	12	
1,250,892	751,906	6,035,929	20,344	225,189	529,032	20,393,106	286,371	34,588,576	13,909,099	23,741	12,755	1,440	485	60	9,001	3,922	13	
625,690	227,176	2,176,988	8,727	27,182	325,940	8,648,012	196,340	14,102,002	5,257,650	14,202	4,672	60	467	150	8,553	129	14	
485,783	683,900	2,780,381	74	18,031	263,565	8,646,970	138,826	16,387,832	7,602,036	9,604	5,643	900	64	.....	2,977	3,329	15	
49,818	41,543	447,772	798	12,489	18,560	1,229,870	27,390	2,107,070	852,950	1,976	385	.....	170	.....	1,420	.....	16	
433,018	183,436	1,517,501	400	10,102	112,397	5,175,817	98,709	8,855,944	3,581,418	7,317	3,255	.....	511	40	3,511	48	17	
215,270	102,643	963,171	14,485	12,866	66,644	3,373,441	27,552	5,570,041	2,169,048	4,006	2,821	40	122	.....	1,023	.....	18	
112,849	39,122	760,664	1,342	23,304	52,108	2,072,918	35,617	3,329,713	1,221,178	4,826	2,560	.....	51	253	1,962	491	19	
355,731	193,011	1,121,020	18,461	38,561	164,004	4,356,631	69,567	7,509,347	3,093,149	6,203	3,270	.....	230	.....	2,703	15	20	
447,493	230,679	2,780,707	30,443	117,920	213,308	7,078,198	135,603	12,629,323	5,411,522	11,515	6,925	15	84	305	4,186	555	21	
1,334,351	782,237	5,821,510	141,616	54,293	719,063	23,643,702	365,706	37,869,230	13,859,822	27,070	14,968	1,752	237	.....	10,113	2,802	22	
399,412	514,549	2,413,479	4,335	24,139	197,323	6,414,926	113,231	11,804,330	5,276,173	8,968	5,587	.....	163	50	3,168	543	23	
231,433	78,768	811,333	20,192	6,077	93,280	3,473,739	14,677	5,933,133	2,444,717	6,003	5,205	280	20	.....	618	48	24	
477,962	323,072	2,841,490	25,061	105,592	172,523	6,676,618	119,366	12,317,666	5,522,632	10,981	5,753	75	259	.....	4,053	570	25	
34,637	15,606	803,420	437	4,420	6,091	766,001	8,843	1,205,349	425,505	1,153	134	.....	17	.....	1,002	.....	26	
76,622	34,217	540,849	18,550	4,455	43,507	1,191,457	20,637	2,131,836	969,692	1,728	435	.....	48	.....	1,195	.....	27	
90,760	40,049	481,602	.....	8,740	36,929	1,246,712	7,793	2,136,905	852,490	2,139	1,715	.....	23	102	299	.....	28	
535,947	175,567	2,100,981	46,944	68,883	201,090	6,082,762	176,432	10,758,566	4,499,382	9,345	4,733	725	544	6	3,337	2,109	29	
8,550	242	44,454	800	1,205	3,093	98,881	5,965	192,665	87,819	410	165	.....	42	.....	203	.....	28	
2,103,249	1,110,880	8,449,335	201,000	498,100	596,971	27,751,288	604,316	49,440,846	21,085,242	41,516	23,525	887	2,000	1,518	13,586	3,912	30	
439,079	88,303	1,715,240	35,480	13,642	247,038	7,088,812	50,181	11,430,082	4,300,089	11,895	9,782	300	110	50	1,653	8	31	
1,093,057	650,105	5,213,136	58,085	135,003	435,391	19,900,630	361,513	32,428,847	12,076,704	28,302	10,268	200	3,389	35	14,410	1,501	32	
157,350	95,955	604,604	43	8,227	74,509	1,570,987	30,830	3,149,868	1,548,051	1,853	470	.....	81	.....	1,302	290	33	
228,898	127,074	1,389,375	17,270	30,918	85,977	3,226,034	52,252	5,804,349	2,526,063	5,901	2,643	65	.....	75	3,118	200	34	
1,578,299	639,644	8,034,355	50,207	205,411	635,193	18,622,481	472,011	35,124,866	16,030,374	36,290	16,348	1,495	2,507	718	15,222	5,549	35	
104,190	33,271	433,394	12,000	20,867	21,412	795,035	26,317	1,712,328	890,976	1,698	880	.....	20	.....	798	15	37	
214,114	68,903	633,800	5,320	15,270	42,986	3,051,129	22,896	4,559,924	1,485,899	3,345	2,220	120	.....	6	1,000	.....	38	
16,311	21,251	180,973	.....	3,392	20,016	427,428	13,629	813,372	372,318	890	.....	.....	.....	.....	834	.....	39	
511,598	202,019	2,019,502	97,100	22,238	186,092	7,456,332	75,529	12,370,082	4,838,221	11,404	7,245	315	108	30	3,706	193	40	
294,908	247,404	1,863,068	24,492	27,208	153,616	5,220,173	69,009	9,792,439	4,506,257	5,821	2,674	100	408	.....	2,639	80	41	
27,487	15,906	280,147	797	1,740	8,420	400,623	14,447	950,303	526,233	2,141	10	.....	4	79	2,048	.....	42	
49,069	44,051	265,377	378	20,799	23,697	1,850,292	5,190	2,846,073	991,191	2,167	1,660	.....	43	258	206	67	43	
475,410	194,617	1,983,039	26,259	22,958	296,298	7,582,698	61,120	11,773,016	4,129,196	9,506	6,658	.....	249	75	2,524	225	44	
331,498	151,551	2,442,734	2,500	40,183	239,629	5,976,182	84,145	10,931,701	4,871,374	11,787	4,110	2,112	39	.....	5,526	458	45	
281,434	187,517	1,186,808	6,073	7,777	99,820	7,628,551	65,118	10,909,224	3,215,555	15,957	11,360	251	1,264	276	2,034	455	46	
806,219	579,918	4,420,192	26,721	20,097	473,701	11,098,124	216,397	20,546,990	9,232,469	833	.....	.....	31	.....	3,656	4,730	47	
4,950	1,824	77,102	.....	2,609	1,129	80,107	4,622	203,776	119,046	443	.....	.....	.....	.....	302	.....	48	
17,058	3,540	50,783	.....	1,330	2,826	123,432	7,380	251,773	120,961	.....	.....	.....	.....	.....	406	.....	49	

\* Same number reported for one or more other months.

† Includes establishments distributed as follows: Nevada, 1; and North Dakota, 10.

TABLE 74.—DETAILED STATEMENT FOR THE

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.							WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Capital.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number, 15th day of—			Male.	Female.	Male.		Female.
								Maximum month.	Minimum month.						

BOXES, WOODEN PACKING.

1	United States.....	1,140	40,807	849	2,036	924	643	42,445	Do 44,881	Ap 40,682	46,327	41,180	4,582	493	72	Dollars. 108,932,998
2	Alabama.....	7	312	1	16	4	.....	291	Jy 338	Do 226	280	258	28	.....	.....	872,213
3	Arkansas.....	6	241	2	12	1	.....	222	Se <sup>a</sup> 241	Jy 204	233	219	13	.....	.....	301,956
4	California.....	46	1,874	28	87	74	28	1,657	Au 1,887	Fe 1,369	1,870	1,685	175	7	.....	7,784,141
5	Colorado.....	4	73	2	7	3	.....	60	My 68	So 54	57	47	9	.....	.....	150,110
6	Connecticut.....	12	63	13	6	.....	.....	42	Mh 50	Je 35	44	43	.....	.....	.....	155,317
7	Delaware.....	7	254	2	15	5	2	230	Ap 254	So 194	247	243	4	.....	.....	345,289
8	Florida.....	20	1,113	14	57	15	2	1,025	Ap 1,136	Au 856	1,085	900	181	4	.....	1,749,788
9	Georgia.....	13	831	6	35	9	3	778	No 872	Ja 700	862	701	159	2	.....	1,140,831
10	Idaho.....	3	25	1	2	.....	.....	21	Jy 34	My 10	26	20	.....	.....	.....	61,611
11	Illinois.....	63	4,920	45	161	122	68	4,524	Ja 5,024	Jy 2,965	4,603	4,127	510	24	2	9,002,089
12	Indiana.....	28	1,064	18	45	29	23	940	So 1,079	Mh 846	1,110	868	174	37	7	1,933,978
13	Iowa.....	15	168	15	11	4	3	135	Ja 143	Jy 127	135	127	2	6	.....	295,195
14	Kansas.....	4	379	3	4	8	1	363	No 414	Fe 396	337	344	43	.....	.....	732,397
15	Kentucky.....	8	545	.....	24	12	9	500	Au 516	Fe <sup>a</sup> 484	490	409	71	.....	.....	856,739
16	Louisiana.....	17	1,339	10	50	34	13	1,282	Do 1,705	Oc 812	1,761	1,520	226	15	5	2,423,551
17	Maine.....	29	1,033	20	40	23	20	918	Do 1,198	My 724	1,213	1,152	58	3	.....	2,624,794
18	Maryland.....	39	2,131	29	92	29	9	1,972	Jy 2,157	So 1,862	2,112	1,616	185	11	.....	3,616,335
19	Massachusetts.....	75	3,550	48	134	52	84	3,232	Do 3,496	My 3,048	3,517	3,044	395	54	24	9,238,276
20	Michigan.....	40	1,650	44	78	20	27	1,481	Au 1,670	Mh 1,285	1,741	1,540	180	21	.....	3,727,416
21	Minnesota.....	28	787	27	41	16	8	695	Au 773	Ja 621	754	600	35	29	.....	1,897,027
22	Mississippi.....	4	872	.....	32	8	11	821	Do 936	Mh 651	930	846	90	.....	.....	1,392,903
23	Missouri.....	20	2,011	14	102	43	25	1,827	Ja 1,971	Je 1,717	1,934	1,593	200	30	2	4,563,985
24	Nebraska.....	6	111	3	5	.....	.....	99	Au 113	Fe 87	100	100	.....	.....	.....	266,413
25	New Hampshire.....	33	1,782	10	65	38	20	1,631	Do 1,833	Jy 1,541	1,835	1,060	168	1	.....	5,488,957
26	New Jersey.....	36	1,335	34	44	33	27	1,107	Fe 1,233	Je 1,153	1,213	1,181	13	19	.....	3,750,217
27	New York.....	162	3,274	160	169	105	62	2,772	No 3,010	So 2,585	3,038	2,851	140	46	1	9,412,627
28	North Carolina.....	27	1,024	15	66	9	12	922	Jy 988	Mh 871	1,008	879	74	52	3	1,786,614
29	Ohio.....	68	2,148	99	99	49	27	1,874	Do 1,999	Ap 1,746	2,008	1,883	122	3	.....	4,346,740
30	Oregon.....	20	662	14	24	12	2	610	Au 826	Fe 437	620	528	90	2	.....	1,479,665
31	Pennsylvania.....	63	1,618	58	111	27	21	1,401	Do 1,573	My 1,227	1,562	1,466	25	42	.....	5,420,664
32	Rhode Island.....	13	275	10	10	3	5	247	Do 275	Mh 219	275	274	.....	.....	.....	778,206
33	South Carolina.....	6	174	2	14	2	2	154	Jy 192	Mh 104	164	162	12	.....	.....	235,824
34	Tennessee.....	11	795	8	36	13	8	730	Jy 824	Ap 623	807	746	59	2	.....	1,223,287
35	Texas.....	19	1,182	12	45	13	8	1,101	Au 1,189	Ja 995	1,192	998	189	5	.....	2,249,136
36	Vermont.....	13	620	12	20	1	8	579	Fe 632	Au 529	609	538	71	.....	.....	2,025,582
37	Virginia.....	34	2,692	8	91	36	23	2,534	Oc 2,719	Au 2,253	2,730	2,218	482	23	7	6,622,701
38	Washington.....	16	729	4	25	13	8	679	Au 781	Fe 598	673	600	53	8	3	2,021,071
39	West Virginia.....	9	204	0	10	3	1	184	Au 218	Fe 152	211	200	11	.....	.....	469,754
40	Wisconsin.....	66	2,873	36	136	49	47	2,605	Au 2,961	Ap 2,304	2,762	2,392	324	31	15	6,767,188
41	All other <sup>4</sup> .....	5	114	1	9	1	2	101	Jy 127	Oc 74	139	136	2	1	.....	185,964

<sup>1</sup> Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).

<sup>2</sup> Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

LUMBER INDUSTRY, BY STATES: 1919—Continued.

EXPENSES.									Value of products.	Value added by manufacture.	POWER.				
Salaries and wages.			For contract work.	Rent and taxes.		For materials.		Total.			Primary horsepower.				Electric horsepower generated in establishments reporting.
Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.				Owned.				
								Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power. <sup>1</sup>	Rent- <sup>2</sup>			

BOXES, WOODEN PACKING.

Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.									
6,631,685	2,022,948	36,811,185	633,898	840,668	4,177,522	101,905,193	1,041,042	177,818,454	74,872,219	144,048	95,021	4,999	1,903	2,495	39,630	12,515	1	
27,380	3,940	163,835	.....	300	7,710	207,719	936	475,180	266,525	800	775	.....	.....	.....	25	5	2	
33,505	4,888	205,088	.....	411	12,826	468,564	4,427	778,767	305,776	419	178	.....	140	.....	101	.....	3	
250,231	94,612	1,648,502	11,520	56,063	106,490	5,695,376	61,325	8,908,686	3,151,985	6,229	1,955	.....	.....	20	4,244	726	4	
10,719	2,948	50,442	10,731	2,765	413	74,542	2,732	174,225	96,951	222	.....	.....	.....	.....	.....	.....	5	
16,901	1,300	43,050	.....	4,276	1,291	281,314	2,405	398,633	114,914	243	70	.....	3	.....	170	.....	6	
43,380	6,000	131,615	.....	.....	4,961	163,884	440	440,794	276,470	538	538	.....	.....	.....	.....	.....	7	
109,295	20,433	610,111	.....	4,215	36,036	1,120,781	4,769	2,739,767	1,414,182	2,390	2,344	.....	2	.....	44	117	8	
125,343	24,348	492,670	.....	6,265	63,090	1,106,745	2,718	2,185,591	986,128	1,928	1,780	.....	28	.....	142	80	9	
5,900	480	17,880	.....	385	226	90,362	2,573	141,881	48,946	173	.....	.....	10	.....	163	.....	10	
586,700	242,454	4,039,741	72,677	145,664	520,408	10,297,194	67,611	18,850,685	8,491,880	10,234	7,432	1,000	17	.....	1,785	1,481	11	
136,475	60,847	687,602	.....	13,331	139,140	1,722,080	18,874	3,164,646	1,423,692	2,481	1,732	.....	33	.....	716	10	12	
29,179	4,135	105,388	.....	2,400	2,112	349,892	7,448	634,832	184,292	621	425	.....	4	.....	192	7	13	
48,900	17,420	320,781	.....	3,320	36,365	998,080	16,430	1,826,807	813,097	945	850	.....	15	.....	80	75	14	
86,626	28,667	314,507	.....	3,000	21,698	904,226	18,740	1,696,985	772,929	1,404	615	.....	50	.....	739	.....	15	
210,472	45,181	792,798	1,001	7,167	116,200	2,379,853	11,399	4,173,296	1,782,044	3,660	3,275	.....	82	.....	303	25	16	
144,457	64,483	708,172	410,824	6,950	82,586	2,535,667	14,049	4,543,880	1,994,164	4,305	3,395	.....	6	64	840	267	17	
303,324	61,953	1,344,552	5,229	39,658	86,501	3,682,352	16,491	6,593,613	2,854,470	6,549	5,615	250	20	.....	664	1,075	18	
545,752	155,016	3,183,412	33,108	61,161	519,635	8,280,165	91,667	15,050,531	6,678,699	12,450	10,005	250	78	513	1,604	1,128	19	
197,020	54,359	1,331,974	7,512	21,702	65,855	2,695,958	50,134	4,677,560	2,231,488	6,772	4,871	85	12	.....	1,804	360	20	
131,515	29,383	691,745	.....	8,854	45,721	2,161,031	29,346	3,454,239	1,263,862	2,525	1,556	.....	.....	.....	969	108	21	
45,677	19,575	624,388	.....	1,200	3,724	509,287	6,782	1,059,191	543,122	1,340	1,340	.....	.....	.....	.....	900	22	
396,090	104,920	1,540,851	.....	50,417	322,108	4,118,714	57,422	7,311,774	3,135,638	5,882	3,249	.....	5	.....	2,628	567	23	
15,278	6,133	108,027	.....	2,659	13,702	299,329	5,249	556,201	251,123	372	125	.....	.....	.....	247	.....	24	
194,690	88,173	1,404,444	6,435	10,051	280,651	4,261,950	22,881	7,080,559	2,795,778	7,514	5,474	.....	27	539	1,474	1,767	25	
204,141	90,497	1,512,937	2,873	5,385	140,126	6,252,467	24,706	8,756,166	2,478,993	1,501	792	.....	15	16	678	251	26	
608,304	217,270	2,076,824	14,959	265,458	264,549	8,112,995	140,328	14,652,338	6,399,065	11,372	6,439	.....	493	820	3,620	626	27	
141,580	32,037	661,127	750	223	66,570	1,967,255	16,141	3,186,720	1,203,324	3,663	2,307	.....	10	.....	1,346	35	28	
336,416	86,661	1,773,927	3,727	38,246	166,954	5,287,965	65,011	8,936,595	3,583,819	6,738	3,712	15	377	.....	2,634	149	29	
92,855	30,309	600,391	7,440	6,850	79,816	2,084,192	27,156	4,112,237	2,000,889	3,540	820	.....	5	.....	2,715	110	30	
345,314	62,133	1,531,934	4,864	17,011	82,054	4,540,555	60,850	7,556,989	2,955,584	5,826	4,168	100	135	40	1,383	153	31	
34,596	7,012	242,932	.....	7,026	26,612	586,970	4,940	1,022,016	430,106	957	810	50	.....	.....	97	7	32	
28,561	3,040	115,031	.....	1,585	1,156	191,264	7,321	371,663	173,078	558	455	.....	.....	.....	103	.....	33	
102,669	28,007	468,164	.....	3,590	14,180	954,634	23,455	1,922,079	943,990	1,770	1,395	.....	.....	.....	375	25	34	
120,656	28,089	627,427	3,615	5,520	29,121	1,580,928	9,332	3,428,162	1,837,902	5,882	1,671	2,000	4	.....	2,007	72	35	
114,643	11,870	405,394	.....	785	94,665	1,080,118	5,831	1,934,066	848,117	1,362	515	.....	25	448	374	20	36	
323,655	99,104	1,775,426	35,104	13,279	153,546	5,894,889	24,584	9,231,697	3,312,224	7,744	5,941	49	34	.....	1,720	5	37	
92,487	28,595	747,571	.....	12,135	60,241	1,706,241	29,889	3,380,997	1,644,867	4,060	1,670	1,000	.....	35	1,355	1,000	38	
25,390	7,817	163,780	.....	1,260	8,219	681,543	3,694	985,260	300,023	1,042	550	.....	250	.....	242	25	39	
352,435	136,057	2,216,772	1,529	4,705	524,349	6,300,441	75,667	11,114,459	4,738,351	7,967	6,159	200	25	.....	1,583	1,344	40	
13,168	2,325	78,304	.....	455	2,609	245,871	4,339	394,162	143,952	270	28	.....	.....	.....	242	.....	41	

<sup>1</sup> Same number reported for one or more other months.  
<sup>2</sup> Includes establishments distributed as follows: Montana, 1; Oklahoma, 2; and Utah, 2.

TABLE 75.—CUSTOM SAWMILLS—STATISTICS, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Paid for contract work.	Rent and taxes.	Cost of materials.	Value of products.	Value added by manufacture.
		Total.	Proprietors and firm members.	Salaries employed.	Wage earners (average number).									
United States:														
1919.....	5,396	10,389	7,177	39	3,173	130,916	\$7,254,316	\$10,616	\$2,053,009	\$7,746	\$72,687	\$736,549	\$5,562,484	\$4,825,935
1900.....	4,133	12,836	5,702	44	7,000	93,280	6,055,145	8,000	1,687,252	(1)	(1)	97,574	4,515,881	4,418,307
Alabama.....	317	591	437	.....	154	8,800	326,515	.....	83,556	.....	4,495	36,537	247,557	211,020
Arkansas.....	106	227	148	.....	79	3,111	129,754	.....	45,510	300	1,278	13,605	121,059	107,364
Colorado.....	3	7	5	.....	2	101	7,400	.....	2,100	.....	48	285	4,125	5,840
Connecticut.....	53	77	61	.....	16	1,385	68,717	.....	13,206	.....	730	6,683	53,971	47,288
Delaware.....	6	20	6	.....	14	165	5,450	.....	10,540	1,200	128	525	230,231	19,706
Florida.....	12	26	15	.....	11	270	25,535	.....	5,496	.....	199	1,514	13,607	12,093
Georgia.....	339	803	569	0	228	7,759	480,714	1,210	131,062	15	3,596	34,455	319,407	285,012
Idaho.....	7	16	14	.....	2	292	10,080	.....	2,224	.....	475	388	5,071	5,583
Illinois.....	98	164	125	.....	38	1,841	127,332	383	26,485	0	1,106	18,042	82,266	64,288
Indiana.....	227	403	277	1	125	5,293	333,795	150	82,371	120	3,700	13,411	230,549	217,138
Iowa.....	53	91	64	.....	27	1,465	91,313	.....	19,120	675	493	6,412	58,450	52,038
Kansas.....	4	7	6	.....	1	118	4,795	.....	625	.....	42	106	2,510	2,314
Kentucky.....	362	765	479	3	283	7,011	351,640	540	169,109	.....	2,970	126,977	531,117	404,140
Louisiana.....	4	12	10	.....	2	106	7,625	.....	966	.....	130	144	5,015	4,871
Maine.....	98	214	112	.....	102	4,595	256,073	.....	77,216	250	4,164	10,386	161,564	145,178
Maryland.....	131	222	147	.....	75	2,353	142,579	.....	51,725	.....	980	12,278	130,586	118,308
Massachusetts.....	27	45	34	.....	11	1,002	53,705	.....	9,906	410	786	1,502	26,099	25,197
Michigan.....	103	199	128	.....	71	2,570	148,240	.....	44,080	250	1,665	8,665	94,317	85,652
Minnesota.....	189	385	262	1	122	5,054	250,253	312	92,658	.....	2,514	13,230	214,223	200,993
Mississippi.....	72	155	97	.....	58	2,187	88,495	.....	31,243	300	991	13,729	80,191	66,462
Missouri.....	285	517	388	.....	129	5,648	343,578	.....	88,938	.....	3,206	28,659	278,210	249,551
Montana.....	7	15	10	.....	5	269	19,400	.....	4,254	50	141	485	10,792	10,307
New Hampshire.....	36	59	40	.....	19	1,640	97,909	.....	15,560	.....	766	2,564	30,818	28,254
New Jersey.....	13	23	17	.....	6	268	37,901	.....	4,979	.....	469	1,078	14,881	13,803
New York.....	407	603	489	4	110	12,129	687,749	130	83,202	175	7,629	43,342	290,016	246,674
North Carolina.....	464	1,030	664	11	355	10,765	618,522	3,505	245,080	1,406	5,780	85,022	585,418	499,496
Ohio.....	262	478	337	.....	141	5,898	325,159	.....	107,026	553	3,292	31,608	290,022	258,354
Oklahoma.....	7	11	8	.....	3	218	13,868	.....	2,454	.....	91	61	6,833	8,023
Pennsylvania.....	277	485	339	.....	146	6,096	407,209	.....	101,437	275	3,538	40,998	295,127	254,459
Rhode Island.....	6	9	6	.....	3	230	9,035	.....	2,800	22	83	646	5,557	4,911
South Carolina.....	196	429	275	8	146	4,685	229,767	3,370	81,524	200	1,786	31,783	216,824	185,041
Tennessee.....	437	807	613	.....	284	8,511	450,801	.....	157,815	.....	4,328	40,797	377,889	337,092
Texas.....	9	16	13	.....	3	400	13,280	.....	1,078	.....	129	480	4,225	3,736
Utah.....	3	5	4	.....	1	78	1,900	.....	482	.....	25	142	1,114	972
Vermont.....	85	157	95	.....	62	3,621	221,393	.....	43,121	166	2,523	12,210	105,026	92,807
Virginia.....	400	696	511	2	183	6,665	435,850	675	165,850	617	3,891	28,008	305,336	276,728
West Virginia.....	101	172	128	.....	44	1,813	85,511	.....	26,251	.....	678	5,131	82,551	77,420
Wisconsin.....	185	346	234	2	110	6,197	353,074	341	75,627	147	4,047	56,078	249,787	193,709
All other states <sup>2</sup> .....	5	12	10	.....	2	241	9,800	.....	2,068	.....	46	306	5,553	5,247

<sup>1</sup> Figures not available.<sup>2</sup> Includes establishments distributed as follows: Nebraska, 1; Oregon, 1; Washington, 1; and Wyoming, 2.

ALASKA.

The preceding statistics for the lumber industry do not include figures for Alaska. Detailed statistics, however, for the lumber and timber products branch of this industry are shown in the following tables.

A wooden-box factory was reported, but figures pertaining thereto were omitted in order to avoid disclosure of individual operations.

Importance and growth of the industry.—Lumbering was second in importance in this territory in 1919, the principal manufacturing industry being the canning and preserving of fish. In Table 76 are shown comparable statistics for lumber and timber products for five censuses. Statistics prior to 1889 are not available.

TABLE 76.—COMPARATIVE SUMMARY: 1919, 1909, 1904, 1899, AND 1889.

	1919	1909	1904	1899	1889	PER CENT OF INCREASE. <sup>1</sup>			
						1909-1919	1904-1909	1899-1904	1889-1899
Number of establishments.....	22	22	6	10	10	.....	266.7	-40.0	.....
Persons engaged.....	273	178	72	( <sup>2</sup> )	( <sup>2</sup> )	53.4	147.2	( <sup>2</sup> )	( <sup>2</sup> )
Proprietors and firm members.....	27	28	5	( <sup>2</sup> )	( <sup>2</sup> )	-3.6	460.0	( <sup>2</sup> )	( <sup>2</sup> )
Salaried employees.....	24	19	4	13	8	26.3	375.0	-69.2	62.5
Wage earners (average number).....	222	131	63	78	78	69.5	107.9	-19.2	.....
Primary horsepower.....	2,019	1,391	335	( <sup>2</sup> )	( <sup>2</sup> )	45.1	315.2	( <sup>2</sup> )	( <sup>2</sup> )
Capital.....	\$865,460	\$658,458	\$205,238	\$150,245	\$105,727	31.4	220.8	36.6	42.1
Salaries and wages.....	373,718	144,284	79,870	63,209	22,173	159.0	80.6	26.4	185.1
Salaries.....	46,426	36,083	8,000	7,250	3,548	28.7	351.0	10.3	104.3
Wages.....	327,292	108,201	71,870	55,959	18,625	202.5	50.6	28.4	200.4
Paid for contract work.....	15,524	1,757	.....	.....	( <sup>2</sup> )	783.6	.....	.....	( <sup>2</sup> )
Rent and taxes.....	11,672	2,821	1,603	( <sup>2</sup> )	( <sup>2</sup> )	313.8	76.0	( <sup>2</sup> )	( <sup>2</sup> )
Cost of materials.....	311,439	168,504	77,914	67,400	30,198	84.8	116.2	15.4	123.4
Value of products.....	950,256	400,272	245,380	154,666	58,440	137.4	63.1	58.6	174.6
Value added by manufacture.....	638,817	231,768	167,466	87,176	28,242	175.6	38.4	92.1	298.7

<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Figures not available.

<sup>3</sup> Value of products less cost of materials.

Wage earners, by months.—Table 77 shows the number of wage earners employed during each month in 1919. The largest number of wage earners in this industry was employed during the summer months, the climatic conditions necessitating the curtailment of operations during the winter.

TABLE 77.—WAGE EARNERS, BY MONTHS: 1919.

MONTH.	Number.	MONTH.	Number.
January.....	59	July.....	278
February.....	133	August.....	291
March.....	181	September.....	273
April.....	310	October.....	285
May.....	312	November.....	161
June.....	302	December.....	79

Size of establishments, by value of products.—The size of establishments, classified by value of products for 1919, are shown in Table 78. Comparable figures for previous censuses are not available.

TABLE 78.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS: 1919.

VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
All classes.....	22	222	\$950,256	\$638,817
Less than \$5,000.....	7	6	20,155	14,075
\$5,000 to \$20,000.....	8	27	95,596	76,227
\$20,000 to \$100,000.....	3	50	153,235	101,916
\$100,000 and over.....	4	139	681,280	446,596

Character of ownership.—Table 79 shows the importance of establishments operated by corporations.

TABLE 79.—CHARACTER OF OWNERSHIP: 1919.

OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
Lumber industry.....	22	222	\$950,256	\$638,817
Individual.....	6	10	37,870	29,631
Corporation.....	7	143	569,215	349,088
All other.....	9	60	343,141	260,098

Stumpage value.—The average stumpage value reported for Alaska in 1919 was \$1.73 per thousand feet b. m., as compared with 50 cents per thousand for 1904, and 97 cents per thousand for 1899.

Production of lumber and shingles.—Table 80 shows the production of lumber and shingles for 1919, 1904, and 1899.

TABLE 80.—PRODUCTION OF LUMBER AND SHINGLES: 1919, 1904, AND 1899.

PRODUCT.	1919	1904	1899
Lumber:			
Total.....M feet b. m.	1 21,673	7,974	6,571
Spruce.....M feet b. m.	21,182	7,933	6,056
Hemlock.....M feet b. m.	491		15
Other.....M feet b. m.		41	500
Shingles.....thousands.		926	

<sup>1</sup> Includes the cut of 1 custom mill.

Detailed statement.—Comparable general statistics are presented in Table 81 for 1919 and 1909.

TABLE 81.—DETAILED STATEMENT: 1919 AND 1909.

	1919	1909
Number of establishments.....	22	22
Persons engaged.....	273	178
Proprietors and firm members.....	27	28
Salaried officers, superintendents and managers.....	10	17
Clerks, male.....	8	2
Wage earners (average number).....	222	131
Number employed 15th day of maximum month.....	May 312	July 264
Number employed 15th day of minimum month.....	Jan. 59	Jan. 15
Wage earners Dec. 15, or nearest representative day 16 years and over.....	339	230
Male.....	337	239
Female.....	2	
Capital.....	\$865,400	\$658,458
Salaries.....	46,426	36,683
Officials.....	34,707	33,683
Clerks, etc.....	11,609	2,400
Wages.....	327,202	108,201
Paid for contract work.....	15,524	1,757
Rent of factory.....	60	1,885
Taxes, Federal, state, county, and local.....	11,612	936
Cost of materials.....	308,220	165,219
Fuel and rent of power.....	3,210	3,285
Value of products.....	950,256	400,272
Value added by manufacture.....	638,817	231,768
Primary horsepower.....	2,019	1,391
Owned.....	1,979	(1)
Steam engines (not turbines).....	1,715	(1)
Internal-combustion engines.....	264	(1)
Water power <sup>2</sup> .....	60	(1)
Rented <sup>3</sup> .....	40	(1)
Electric horsepower generated in establishments reporting.....	17	(1)

<sup>1</sup> Figures not available.

<sup>2</sup> Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).

<sup>3</sup> Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

## CHAPTER II.—PULP-WOOD CONSUMPTION AND WOOD-PULP PRODUCTION.

### INTRODUCTION.

In this report are presented statistics of the consumption of wood in the manufacture of wood pulp and the production of wood pulp in the United States during the year 1919 and comparative data for other years.<sup>1</sup>

The pulp and paper industry was particularly active in 1919 on account of the extraordinary demand and the high prices commanded for all grades of paper during the last half of the year.

While the cost of all materials increased, the scarcity and high cost of labor, and the inadequate transportation facilities greatly affected the production of pulp wood. Some mills were undoubtedly forced to draw on their reserve stock of wood to meet the requirements for wood pulp.

The data are shown in 14 tables. Tables 1 to 9, inclusive, show the consumption of pulp wood by kinds of wood, and the production of wood pulp by processes, and by states. Tables 10 to 14, inclusive, give quantities and values of imports and exports of pulp wood, wood pulp, and paper, as such data are essential for the proper presentation of statistics for the industry.

### PULP-WOOD CONSUMPTION.

**Comparative consumption of pulp wood (Table 1).—**Apparently no great changes in the kinds of wood consumed in this industry have taken place in the past few years, but considerable fluctuations are shown in the quantities reported for some of the species. The consumption of hemlock, domestic poplar, balsam fir, and some of the less important woods decreased in 1919, compared with 1918. However, these decreases were more than offset by increases in other species of wood, notably domestic spruce, imported spruce and poplar, and yellow pine, resulting in a total increase of 227,038 cords of 128 cubic feet, or 4.3 per cent, over the total consumption in 1918.

The items shown for jack pine in 1918 include data for miscellaneous woods not reported separately and locally designated as jack pines but probably include some red gum and various species of yellow pine such as scrub, pitch, and shortleaf among other kinds. For 1919 these woods were distributed and shown

<sup>1</sup> Similar statistics were published by the Forest Service for 1905; by the Bureau of the Census in cooperation with the Forest Service for 1906 to 1911, inclusive; by the Bureau of the Census for 1914; and by the Forest Service in cooperation with the News Print Service Bureau for 1916 to 1918, inclusive.

under their proper classification as nearly as could be ascertained.

**Cost and consumption of pulp wood (Table 2).—**The quantity of pulp wood used shows a large increase for the two decades. Of greater significance, however, is the cost of such wood, the average per cord having increased more than three times during the twenty years, from \$4.95 per cord in 1899 to \$15.95 per cord in 1919.

**Number and location of establishments (Table 3).—**Maine, New York, and Wisconsin reported 64 per cent of the number of establishments and 58 per cent of the total quantity of wood consumed in the 25 states operating pulp mills in 1919.

A great many woods are being manufactured into pulp, and no doubt the use of woods at present not considered especially suitable will increase from time to time because of the depletion of the supply of the more desirable species. During 1919 spruce, hemlock, poplar, balsam fir, and yellow pine contributed 88.4 per cent of the total for the United States.

**Processes of manufacture (Table 4).—**The greater part of the wood consumed in this industry in 1919 was utilized in the manufacture of sulphite pulp, 52.3 per cent being converted by this process; 28 per cent was utilized in the production of ground wood pulp; 14.6 per cent in soda pulp; and 5 per cent in sulphate pulp.

The softwoods or conifers, except yellow pine, were used largely in the manufacture of mechanical, sulphite, and sulphate pulp, while the so-called hardwoods were reduced primarily by the soda process. Most of the yellow pine, unlike other conifers, was used in making soda pulp. Gum, Douglas fir, willow, and sycamore are the only woods which are shown as being converted into pulp by the soda process exclusively.

**Condition in which purchased, by states (Table 5).—**New York and New Hampshire reported the highest average cost per cord of pulp wood, with Maine and Massachusetts showing but slightly lower averages. The high average cost shown for these states was doubtless due, primarily, to the fact that a large portion of the wood used in each was spruce and poplar, which are two of the most valuable woods utilized in the industry, and also to the large percentage of peeled and rossed wood reported. The average value per cord differed considerably, according to the condition in which purchased, the extra labor being, as a rule, reflected in the cost of peeled and rossed wood.

In 1919, 47 per cent of the wood was purchased rough, 46.3 per cent peeled, and 6.7 per cent rossed.

The condition of the wood used in various mills differed somewhat according to location. In New England and the Eastern states generally, a large part of the wood was purchased peeled or rossed, while in the lake states—Michigan, Minnesota, and Wisconsin—more than 93 per cent of the wood was purchased rough. Rough wood formed 78.8 per cent of the total consumption in the Pacific coast states.

**Condition in which purchased, by kinds of wood (Table 6).—**The greater percentage of domestic spruce, hemlock, balsam fir, larch or tamarack, jack pine, and white fir was purchased rough; while imported spruce, domestic and imported poplar, yellow pine, yellow poplar, and other less important species were generally peeled. Spruce and balsam fir contributed most of the rossed wood, and only comparatively small quantities of other species were reported as purchased in that condition.

#### WOOD-PULP PRODUCTION.

**Consumption of wood and production of wood pulp (Table 7).—**Except for the steadily mounting cost of wood it is not apparent that any startling change has taken place in this industry. The number of establishments reporting has remained fairly constant and the growth in the industry confined largely to the increased output of each plant rather than to the increased number of mills.

The three leading states for all the years shown have been Maine, New York, and Wisconsin, mentioned in the order of their importance for the past three years. In 1909 New York led with Maine in second place and Wisconsin third. These three states consumed 58.2 per cent of the total quantity of pulp wood in 1919, 59 per cent in 1918, 57.9 per cent in 1917, and 60 per cent in 1909.

**Production of wood pulp, by processes (Table 8).—**The form of Table 8 has been changed from the style adopted by the Forest Service for previous years to avoid disclosing the operations of individual establishments. The figures compiled by the Forest Service for 1917 and 1918 did not show separate data for screenings. Otherwise, it is believed the statistics are fairly comparable for these years.

Of the mechanical pulp produced, 18.5 per cent was reported steamed, as compared with 10 per cent in

1918 and 13 per cent in 1917. Bleached sulphite pulp decreased 9 per cent since 1918, but increased 12.8 per cent and 32.3 per cent, respectively, since 1917 and 1914. The table shows that by far the greater per cent of sulphite and sulphate pulp was unbleached, but that more than 90 per cent of the soda pulp was bleached.

**Comparative production of wood pulp (Table 9).—**The total production of wood pulp was greater in 1919 than that reported for any other year for which records are available. The increase from 1918 was 204,091 short tons, or 6.2 per cent. The production, by processes, however, has fluctuated to such an extent that the output for each class has been exceeded in some previous year.

#### IMPORTS AND EXPORTS.

The data shown in Tables 10 to 14, inclusive, were compiled from "The Monthly Summary of Imports and Exports of the United States" published by the Bureau of Foreign and Domestic Commerce and are included in this bulletin for ready reference.

The published figures of quantities of imports and exports were given in long tons for wood pulp and in pounds for paper. For convenience in making comparisons, these data have been reduced to short tons in this bulletin.

Not all of the imported woods are shown separately in the tables giving the consumption of pulp wood. Separate figures are given for only two kinds—imported spruce and imported poplar. Table 10 includes data for other imported woods. The statistics of pulp-wood consumption pertain to the quantity used during the particular year and may include some imported stock of prior years. Consequently the figures for imports and imported woods used are not comparable.

The foreign trade in pulp wood, wood pulp, and paper was brisk during 1919. This was particularly noticeable for paper, the figures for importations and exportations setting new high records. The imports of pulp wood and wood pulp, while not exceeding those of previous years, maintained a high level. The exports of wood pulp exceeded those shown for any previous year by a small margin.

TABLE 1.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD, WITH PER CENT DISTRIBUTION: 1919, 1918, 1917, AND 1909.

KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).				PER CENT DISTRIBUTION.			
	1919	1918	1917	1909	1919	1918	1917	1909
Total.....	5,477,832	5,250,794	5,480,075	4,001,607	100.0	100.0	100.0	100.0
Spruce:								
Domestic.....	2,313,419	2,204,143	2,385,966	1,653,249	42.2	42.0	43.5	41.3
Imported.....	873,795	666,164	681,450	768,332	16.0	12.7	12.4	19.2
Hemlock.....	795,184	830,406	775,003	559,657	14.5	15.9	14.1	14.0
Poplar:								
Domestic.....	180,160	210,849	313,955	302,876	3.3	4.0	5.7	7.6
Imported.....	158,220	78,384	92,298	25,622	2.9	1.5	1.7	0.6
Balsam fir.....	288,814	368,117	382,036	95,366	5.3	7.0	7.0	2.4
Yellow pine.....	234,463	133,774	142,094	90,885	4.3	2.5	2.6	2.3
Yellow poplar.....	72,605	61,247	41,155	(2)	1.3	1.2	0.7	.....
Jack pine.....	51,581	182,124	75,382	(3)	0.9	2.9	1.4	.....
Larch, or tamarack.....	44,042	52,031	58,732	(4)	0.8	1.0	1.1	.....
White fir.....	31,138	35,119	33,181	37,176	0.6	0.7	0.6	0.9
Gum.....	30,355	47,145	32,513	(4)	0.6	0.9	0.6	.....
Cottonwood.....	20,830	18,685	32,993	36,898	0.4	0.4	0.6	0.9
Basswood.....	9,799	12,110	8,807	(4)	0.2	0.2	0.1	.....
White pine.....	7,566	10,183	3,562	(4)	0.1	0.2	0.1	.....
Beech, birch, maple, and chestnut.....	183,426	202,930	183,317	(4)	3.3	3.9	3.3	.....
All other species.....	7,384	6,810	8,649	182,569	0.1	0.1	0.2	4.6
Slabs.....	175,081	184,603	233,982	248,977	3.2	2.9	4.3	6.2

<sup>1</sup> Forest Service figures.    <sup>2</sup> Included in "Domestic poplar" previous to 1916.    <sup>3</sup> Included in "Yellow pine."    <sup>4</sup> Included in "All other species."

TABLE 2.—QUANTITY AND COST OF PULP WOOD CONSUMED ANNUALLY FOR SPECIFIED YEARS: 1899-1919.

YEAR.	Consumption (cords).	COST (F. O. B. MILL).		YEAR.	Consumption (cords).	COST (F. O. B. MILL).	
		Total.	Average per cord.			Total.	Average per cord.
1919.....	5,477,832	\$87,386,083	\$15.95	1909.....	4,001,607	\$34,477,540	\$8.62
1918.....	5,250,794	78,167,118	13.93	1908.....	3,346,953	28,047,473	8.38
1917.....	5,480,075	60,815,057	11.10	1907.....	3,962,660	32,360,276	8.17
1916.....	5,228,568	45,785,082	8.76	1906.....	3,661,176	26,411,887	7.21
1914.....	4,470,763	39,408,463	8.81	1905.....	3,192,123	17,735,665	5.56
1911.....	4,328,052	.....	.....	1899.....	1,986,310	9,837,516	4.96
1910.....	4,094,306	.....	.....				

<sup>1</sup> Not including cost of slabs and other mill waste in Louisiana, Massachusetts, North Carolina, and Virginia.

TABLE 3.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	Number of establishments.	PULP WOOD CONSUMED (CORDS).								
		Total.	Spruce.		Hemlock.	Poplar.		Balsam fir.	Yellow pine.	Yellow poplar.
			Domestic.	Imported.		Domestic.	Imported.			
United States.....	258	5,477,832	2,313,419	873,795	795,154	180,160	158,220	288,814	234,463	72,605
Maine.....	84	1,279,852	893,378	141,164	10,129	113,812	59,124	41,939	.....	.....
New York.....	84	1,055,145	349,978	519,906	55,722	32,178	71,475	16,532	8	.....
Wisconsin.....	47	854,186	244,710	37,660	417,863	2,643	.....	79,772	.....	.....
Pennsylvania.....	14	423,822	44,829	76,824	8,737	18,439	27,194	10,000	86,840	.....
New Hampshire.....	10	375,597	183,235	79,570	1,172	66	2	92,347	.....	.....
Michigan.....	12	207,234	64,393	17,293	42,047	1,555	.....	38,120	.....	.....
Minnesota.....	6	203,862	203,862	.....	.....	.....	.....	.....	.....	.....
Washington.....	4	139,865	38,085	.....	66,598	.....	.....	.....	.....	.....
Vermont.....	9	111,679	102,200	4,305	477	181	153	4,412	.....	.....
West Virginia.....	5	83,590	46,567	.....	18,211	.....	.....	.....	2,700	1,183
Massachusetts.....	4	51,981	35,830	5,983	.....	4,205	272	5,691	.....	.....
California and Oregon.....	6	171,765	81,700	.....	119,517	.....	.....	.....	144,915	71,422
All other states <sup>1</sup> .....	23	519,755	74,656	.....	54,676	7,181	.....	.....	.....	.....

<sup>1</sup> Includes establishments distributed as follows: Delaware, 1; District of Columbia, 1; Georgia, 2; Louisiana, 3; Maryland, 2; Mississippi, 1; North Carolina, 3; Ohio, 3; South Carolina, 1; Tennessee, 1; Texas, 1; and Virginia, 4.

TABLE 3.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY STATES: 1919—Continued.

STATE.	PULP WOOD CONSUMED (CORDS)—continued.									
	Jack pine.	Larch, or tamarack.	White fir.	Gum.	Cotton-wood.	Bass-wood.	White pine.	Beech, birch, maple, and chestnut.	All other.	Slabs and other mill waste.
United States.....	51,581	44,042	31,138	30,355	20,830	9,799	7,596	183,426	7,384	175,081
Maine.....						734	1,771	13,757		4,046
New York.....						4,029	516			13,113
Wisconsin.....	38,370	27,174					114			5,858
Pennsylvania.....				22,931			3,893	60,183		54,952
New Hampshire.....										19,205
Michigan.....	13,205	10,808					800	235		12,658
Minnesota.....										
Washington.....			12,737		15,216				6,699	
Vermont.....										
West Virginia.....							412			14,517
Massachusetts.....										
California and Oregon.....			18,401		164					1,983
All other states <sup>1</sup> .....				7,424	5,420	4,430		100,251	685	48,739

<sup>1</sup> Includes establishments distributed as follows: Delaware, 1; District of Columbia, 1; Georgia, 2; Louisiana, 3; Maryland, 2; Mississippi, 1; North Carolina, 3; Ohio, 3; South Carolina, 1; Tennessee, 1; Texas, 1; and Virginia, 4.

TABLE 4.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY PROCESSES OF MANUFACTURE: 1919.

KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).					KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).							
	Total.	Reduced by—					Total.	Reduced by—						
		Mechanical process.	Sulphite process.	Soda process.	Sulphate process.			Mechanical process.	Sulphite process.	Soda process.	Sulphate process.			
Total.....	5,477,832	1,536,447	2,860,603	802,186	272,596	White fir.....	31,138	0,950	21,183	30,355				
Spruce:						Gum.....	30,355			20,666				
Domestic.....	2,313,419	1,040,000	1,237,019	1,546	34,764	Cottonwood.....	20,830	164		9,201				
Imported.....	873,795	327,082	640,647	2,059	3,507	Basswood.....	9,799	479	119					
Hemlock.....	795,154	71,215	697,017	4,221	22,701	White pine.....	7,596	2,807	0	3,893	80			
Poplar:						Beech, birch, maple, and chestnut.....	183,426		235	183,191				
Domestic.....	180,160	10,781	3,087	100,203	89	All other species <sup>1</sup> .....	7,384			7,384				
Imported.....	158,220	620	402	167,198		Slabs.....	175,081	7,836	143,011	8,656	15,577			
Balsam fir.....	288,314	35,487	210,692	1,100	41,535									
Yellow pine.....	234,463	4,863	2,070	134,491	92,130									
Yellow poplar.....	72,005	1,183		71,422										
Jack pine.....	51,581	23,737			27,844									
Larch, or tamarack.....	44,042	153	10,301		33,588									

<sup>1</sup> Includes Douglas fir, willow, and sycamore.

TABLE 5.—PULP-WOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD OF WOOD CONSUMED, BY CONDITION PURCHASED AND BY STATES: 1919.

STATE.	TOTAL.		ROUGH.		PEELED.		ROSSSED.	
	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).
United States.....	5,477,832	\$15.05	2,575,937	\$12.95	2,530,168	\$18.09	365,727	\$22.11
Maine.....	1,270,852	10.37	438,802	18.04	682,855	10.37	158,185	21.11
New York.....	1,055,145	10.43	170,308	16.10	998,335	10.31	180,442	23.30
Wisconsin.....	354,185	11.09	809,804	12.12	44,381	12.27		
Pennsylvania.....	423,822	16.22	110,541	12.00	296,014	17.20	17,267	17.41
New Hampshire.....	375,597	19.43	61,085	15.06	313,837	20.64	75	23.00
Michigan.....	207,234	12.48	171,372	12.39	35,862	11.86		
Minnesota.....	203,802	11.80	203,802	11.86				
Washington.....	130,365	10.00	117,420	10.42	21,045	7.84		
Vermont.....	111,079	15.07	65,918	13.70	41,562	16.31	4,199	25.11
West Virginia.....	83,500	11.02	40,140	9.50	43,450	13.50		
Massachusetts.....	51,081	10.33	10,463	15.77	35,909	10.16	5,609	26.80
California and Oregon.....	171,765	9.02	127,896	9.70	43,969	12.52		
All other states <sup>1</sup> .....	519,765	11.48	241,696	8.59	278,069	14.21		

<sup>1</sup> Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia.

PULP WOOD AND WOOD PULP.

TABLE 6.—PULP-WOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD, BY CONDITION PURCHASED AND BY KINDS OF WOOD: 1919.

KIND OF WOOD.	TOTAL.		ROUGH.		PEELED.		ROSSED.	
	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).
Total.....	5,477,832	\$15.95	2,575,937	\$12.95	2,536,168	\$18.09	365,727	\$22.19
Spruce:								
Domestic.....	2,313,419	17.20	1,285,579	15.05	976,040	19.51	71,800	22.25
Imported.....	873,795	20.85	137,690	19.00	459,345	20.40	276,760	22.14
Hemlock.....	795,154	11.02	616,076	10.45	176,899	14.12	2,179	16.22
Poplar:								
Domestic.....	180,160	17.84	25,657	12.42	154,490	17.58	13	15.23
Imported.....	158,220	13.02			158,202	18.16	18	26.44
Balsam fir.....	288,814	15.65	148,110	11.76	128,947	20.02	11,757	24.09
Yellow pine.....	234,463	11.71	87,576	7.19	146,887	14.49		
Yellow poplar.....	72,605	15.02	1,183	9.50	71,422	15.11		
Jack pine.....	51,581	9.88	50,934	9.80	647	14.00		
Larch, or tamarack.....	44,042	9.78	43,395	10.08	647	14.00		
White fir.....	31,138	9.49	23,578	9.53	7,560	8.79		
Gum.....	30,355	13.20			30,355	18.20		
Cottonwood.....	20,830	8.42	164	11.18	20,666	9.39		
Basswood.....	9,799	16.13	250	8.00	9,549	16.23		
White pine.....	7,566	14.64	1,894	8.83	5,672	16.00		
Beech, birch, maple, and chestnut.....	183,428	12.11	80,874	8.66	99,352	14.76	3,200	17.00
All other species <sup>1</sup> .....	7,384	7.28			7,384	7.28		
Slabs.....	175,081	9.66	92,977	7.43	82,104	12.04		

<sup>1</sup> Includes Douglas fir, willow, and sycamore.

TABLE 7.—PULP-WOOD CONSUMPTION—NUMBER OF MILLS REPORTING, QUANTITY AND COST OF WOOD CONSUMED, AND QUANTITY OF WOOD PULP PRODUCED, BY STATES: 1919, 1918, 1917, AND 1909.

STATE.	Year.	Number of mills reporting.	WOOD CONSUMED.			Wood pulp produced (tons).	STATE.	Year.	Number of mills reporting.	WOOD CONSUMED.			Wood pulp produced (tons).	
			Quantity (cords).	Cost (f. o. b. mill).						Quantity (cords).	Cost (f. o. b. mill).			
				Average per cord.	Total.						Average per cord.	Total.		
United States.....	1919	258	5,477,832	\$15.95	\$87,386,083	Minnesota.....	1919	6	206,862	\$11.86	\$2,416,847	129,500		
	1918	250	5,250,794	13.93	73,167,118		1918	6	182,002	11.79	2,145,170		121,444	
	1917	246	5,480,075	11.10	60,815,057		1917	6	205,026	11.31	2,319,833		140,353	
	1909	253	4,001,607	8.02	34,477,540		1909	7	47,373	7.02	332,548		87,295	
Maine.....	1919	34	1,270,852	19.37	24,795,623	Washington.....	1919	4	139,365	10.00	1,393,636	83,575		
	1918	33	1,234,969	15.57	19,226,644		1918	3	108,187	9.02	975,905		68,018	
	1917	33	1,309,239	11.31	14,813,887		1917	3	99,585	7.09	706,313		93,576	
	1909	37	903,962	9.15	8,207,958		1909							
New York.....	1919	84	1,055,145	19.43	20,498,405	Vermont.....	1919	9	111,679	15.07	1,682,864	85,945		
	1918	75	1,003,742	17.89	17,954,934		1918	9	99,687	15.47	1,542,652		83,548	
	1917	79	1,056,556	14.45	15,270,142		1917	10	109,616	12.33	1,351,825		94,975	
	1909	90	921,882	10.45	9,630,575		1909	11	70,977	10.18	722,777		59,366	
Wisconsin.....	1919	47	854,185	11.99	10,242,909	West Virginia.....	1919	5	83,590	11.62	971,376	39,195		
	1918	46	800,857	9.93	8,551,564		1918	5	109,885	11.22	1,233,252		48,261	
	1917	43	805,490	8.79	7,083,173		1917	5	119,913	8.61	1,032,045		54,813	
	1909	37	576,019	7.46	4,294,229		1909	5	109,166	5.43	532,935		48,797	
Pennsylvania.....	1919	14	423,822	16.22	6,873,612	Massachusetts.....	1919	4	51,981	19.33	1,004,840	22,611		
	1918	14	383,690	15.48	5,941,382		1918	4	45,754	17.53	792,233		30,674	
	1917	14	415,778	11.23	4,669,165		1917	4	55,867	12.53	703,369		30,802	
	1909	15	295,038	7.25	2,139,087		1909	5	45,899	8.80	408,778		25,804	
New Hampshire.....	1919	10	375,597	19.43	7,297,625	California and Oregon	1919	6	171,765	9.62	1,652,452	122,990		
	1918	11	345,272	18.10	6,248,764		1918	6	131,587	8.90	1,171,073		100,036	
	1917	11	416,553	13.78	5,738,883		1917	5	162,709	6.03	981,357		120,237	
	1909	11	349,997	9.36	3,276,620		1909	5	104,021	7.66	797,267		83,692	
Michigan.....	1919	12	207,234	12.48	2,586,808	All other states.....	1919	23	519,755	11.48	5,999,076	233,791		
	1918	12	208,516	10.57	2,150,354		1918	26	541,637	9.66	5,233,461		235,174	
	1917	11	187,117	9.30	1,740,530		1917	22	536,593	8.21	4,404,685		243,312	
	1909	8	132,846	6.29	835,861		1909	122	444,427	7.19	3,193,855		209,285	

<sup>1</sup> Not reported separately in 1909.  
<sup>2</sup> Data for California included with "All other states." Figures shown are for Oregon only.  
<sup>3</sup> Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia.  
<sup>4</sup> Includes California, Delaware, Maryland, North Carolina, Ohio, South Carolina, Texas, Virginia, and Washington.

TABLE 8.—PRODUCTION OF STEAMED, NOT STEAMED, BLEACHED, AND UNBLEACHED WOOD PULP IN THE UNITED STATES, BY PROCESSES: 1919, 1918, 1917, 1914, AND 1909.

PROCESS.	WOOD PULP PRODUCED (TONS).					PROCESS.	WOOD PULP PRODUCED (TONS).				
	1919	1918	1917	1914	1909		1919	1918	1917	1914	1909
Total.....	3,517,952	3,313,861	3,509,939	2,893,150	2,495,523	Sulphates.....	120,378	142,362	84,799	52,641	(1)
Mechanical.....	1,518,829	1,364,504	1,535,953	1,203,061	1,179,260	Unbleached.....	92,375	124,177	69,098	(1)	(1)
Not steamed.....	1,237,194	1,228,274	1,335,268	(1)	(1)	Bleached.....	28,003	18,185	14,801	(1)	(1)
Steamed.....	281,635	136,230	199,685	(1)	(1)	Screenings.....	47,223	(1)	(1)	47,593	(1)
Sulphite.....	1,419,829	1,456,933	1,451,757	1,151,327	1,017,631	Mechanical.....	12,220	(1)	(1)	11,769	(1)
Unbleached.....	910,001	896,657	999,909	765,978	(1)	Chemical.....	35,003	(1)	(1)	35,824	(1)
Bleached.....	509,738	559,976	451,848	385,349	(1)						
Soda.....	411,693	350,362	437,430	347,928	298,626						
Unbleached.....	27,608	29,499	34,509	(1)	(1)						
Bleached.....	384,085	320,863	402,921	(1)	(1)						

1 Not reported.

TABLE 9.—PRODUCTION OF WOOD PULP, BY PROCESSES, FOR SPECIFIED YEARS: 1899-1919.

YEAR.	WOOD PULP PRODUCED (TONS).					YEAR.	WOOD PULP PRODUCED (TONS).				
	Total.	Mechanical.	Sulphite.	Soda.	Sulphate.		Total.	Mechanical.	Sulphite.	Soda.	Sulphate.
1919.....	3,517,952	1,518,829	1,419,829	411,693	120,378	1910.....	2,533,970	(8)	(8)	(8)	(8)
1918.....	3,313,861	1,364,504	1,456,933	350,362	142,362	1909.....	2,495,523	1,179,260	1,017,631	298,626	(8)
1917.....	3,509,939	1,535,953	1,451,757	437,430	84,799	1908.....	2,118,947	(8)	(8)	(8)	(8)
1916.....	3,435,001	1,608,139	1,466,402	387,021	73,439	1907.....	2,547,879	(8)	(8)	(8)	(8)
1915.....	2,893,150	1,293,061	1,151,327	347,928	52,641	1906.....	1,921,768	908,976	756,022	196,770	(8)
1914.....	2,686,134	(8)	(8)	(8)	(8)	1905.....	1,179,525	580,374	416,037	177,114	(8)

1 Includes screenings, mechanical 12,220 tons, and chemical, not shown by process, 35,003 tons.

2 Includes screenings, mechanical 11,769 tons, and chemical, not shown by process, 35,824 tons.

3 Not reported separately.

TABLE 10.—IMPORTS OF PULP WOOD: 1910-1919.

CALENDAR YEAR.	TOTAL.			ROUGH.			PEELED.			ROSSED.		
	Quantity (cords).	Value.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.
Total (10 years).....	10,311,898	\$77,066,470	\$7.53	2,127,761	20.6	\$9.81	6,266,052	60.8	\$7.37	1,018,085	18.6	\$8.84
1919.....	1,047,260	10,458,753	9.99	241,420	23.1	9.59	698,785	66.7	9.70	107,094	10.2	12.75
1918.....	1,370,627	13,392,590	9.75	276,644	20.2	9.11	964,804	70.4	9.65	128,579	9.4	12.04
1917.....	1,031,934	8,593,458	8.30	203,081	20.0	7.29	678,235	65.2	8.07	152,618	14.8	10.73
1916.....	1,007,677	7,292,570	6.56	100,921	17.4	5.93	742,337	67.6	6.43	104,519	15.0	7.90
1915.....	975,974	6,278,948	6.43	258,620	26.5	5.82	544,189	55.8	6.28	173,215	17.7	7.83
1914.....	960,649	6,773,198	6.78	108,414	19.8	6.04	599,299	60.0	6.40	201,936	20.2	8.61
1913.....	1,034,885	7,007,350	6.77	105,906	18.9	5.66	581,755	56.2	6.47	257,223	24.9	8.50
1912.....	933,505	6,227,346	6.67	139,002	14.9	6.03	528,000	56.7	6.06	265,603	28.4	8.23
1911.....	880,257	5,682,710	6.39	101,062	21.5	5.44	473,116	53.2	5.98	225,079	25.8	8.06
1910.....	931,731	6,100,574	6.56	229,691	24.7	5.83	469,681	49.8	6.28	242,359	26.0	7.77

TABLE 11.—IMPORTS OF WOOD PULP: 1909-1919.

CALENDAR YEAR.	TOTAL.			CHEMICAL, UNBLEACHED.					
	Quantity (short tons).	Value.	Average value per ton.	Unclassified.		Sulphite.		Sulphate.	
				Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.
Total (11 years).....	6,338,231	\$243,653,407	\$38.44	1,941,128	\$63,590,773	913,931	\$65,066,376	433,511	\$30,199,194
1919.....	636,017	37,048,381	58.25	.....	.....	239,952	17,979,170	145,911	9,084,537
1918.....	578,209	31,477,175	54.44	.....	.....	253,454	16,973,540	118,761	7,971,067
1917.....	677,841	41,979,330	61.93	.....	.....	248,173	19,291,410	107,933	6,993,170
1916.....	683,705	26,985,693	39.47	1 135,044	1 5,255,237	2 172,352	2 10,822,256	2 60,906	2 3,150,420
1915.....	568,379	16,907,026	29.75	321,700	10,954,182	.....	.....	.....	.....
1914.....	675,565	20,411,225	30.21	330,270	11,180,232	.....	.....	.....	.....
1913.....	541,455	15,935,517	29.43	296,255	9,676,380	.....	.....	.....	.....
1912.....	540,150	14,903,218	27.59	277,201	8,477,766	.....	.....	.....	.....
1911.....	562,425	14,394,263	25.59	213,241	6,482,360	.....	.....	.....	.....
1910.....	506,775	13,296,600	26.24	205,745	6,374,762	.....	.....	.....	.....
1909.....	367,650	10,315,089	28.06	161,672	5,189,794	.....	.....	.....	.....

CALENDAR YEAR.	CHEMICAL, BLEACHED.						MECHANICALLY GROUND.	
	Unclassified.		Sulphite.		Sulphate.		Quantity (short tons).	Value.
	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.		
Total (11 years).....	610,740	\$27,708,513	119,599	\$11,745,679	15,141	\$1,192,478	2,304,180	\$44,150,394
1919.....	.....	.....	42,755	4,472,593	5,145	394,765	202,263	5,117,316
1918.....	.....	.....	16,757	1,512,742	3,759	299,790	185,478	4,720,036
1917.....	.....	.....	41,037	4,508,368	1,625	195,014	279,073	7,991,368
1916.....	1 29,284	1 1,506,034	2 19,050	2 1,251,976	2 4,612	2 302,909	262,517	4,696,801
1915.....	72,623	3,363,998	.....	.....	.....	.....	174,066	2,588,846
1914.....	128,038	5,984,060	.....	.....	.....	.....	217,256	3,246,933
1913.....	77,311	3,588,356	.....	.....	.....	.....	167,889	2,670,781
1912.....	77,146	3,374,071	.....	.....	.....	.....	185,804	3,051,381
1911.....	89,502	3,689,945	.....	.....	.....	.....	262,681	4,221,948
1910.....	76,847	3,343,422	.....	.....	.....	.....	224,184	3,578,316
1909.....	62,989	2,858,627	.....	.....	.....	.....	142,989	2,266,668

1 Jan. 1 to June 30 only.

2 July 1 to Dec. 31.

TABLE 12.—EXPORTS OF WOOD PULP: 1909-1919.

CALENDAR YEAR.	Quantity (short tons).	VALUE.		CALENDAR YEAR.	Quantity (short tons).	VALUE.	
		Average per ton.	Total.			Average per ton.	Total.
Total (11 years).....	234,988	\$59.83	\$14,059,366	1914.....	12,337	39.27	\$494,477
1919.....	40,067	76.10	3,048,491	1913.....	19,776	37.34	738,451
1918.....	22,324	77.67	1,733,872	1 14,189	38.27	542,949	
1917.....	39,180	88.55	3,469,547	1 9,494	40.73	386,711	
1916.....	40,023	53.01	2,121,745	1 8,361	41.17	344,251	
1915.....	20,204	40.41	820,134	1910.....	1 8,953	41.19	368,738
.....	.....	.....	.....	1909.....	.....	.....	.....

1 Quantity shown in pounds, reduced in this table to the nearest short tons.

TABLE 13.—IMPORTS OF PAPER: 1909-1919.

CALENDAR YEAR.	Total value.	NEWSPRINT PAPER.		ALL OTHER PRINTING PAPER.		WRAPPING PAPER.		ALL OTHER PAPER.
		Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Value.
Total (11 years).....	\$316,285,293	3,378,070	\$171,720,345	15,936	\$2,045,310	44,809	\$5,452,284	\$137,067,354
1919.....	53,602,174	627,734	43,674,204	79	58,119	2,401	406,570	9,463,191
1918.....	42,753,780	596,270	35,023,161	91	42,033	3,971	541,896	7,146,120
1917.....	41,734,084	559,113	30,929,028	206	67,031	3,331	456,752	10,279,773
1916.....	28,189,988	468,230	18,527,748	630	119,802	3,552	280,952	9,261,496
1915.....	24,465,694	368,409	14,138,651	1,198	161,703	11,104	626,661	9,538,679
1914.....	27,604,771	315,475	12,189,702	2,370	261,616	20,540	1,156,591	13,966,772
1913.....	24,359,827	219,844	8,540,062	3,379	371,328	.....	735,857	14,703,580
1912.....	18,723,877	85,593	3,262,778	2,799	292,242	.....	849,500	14,322,237
1911.....	18,112,859	55,830	2,036,105	3,688	534,250	.....	400,535	15,081,969
1910.....	18,588,896	56,061	2,182,241	1,900	1,135,686	.....	.....	16,270,659
1909.....	18,149,343	24,911	1,146,885	.....	.....	.....	.....	17,062,458

<sup>1</sup> July 1 to Dec. 31.<sup>2</sup> Newsprint paper and other printing paper.

TABLE 14.—EXPORTS OF PAPER: 1909-1919.

CALENDAR YEAR.	Total value.	NEWSPRINT PAPER.		ALL OTHER PRINTING PAPER.		WRAPPING PAPER.		ALL OTHER PAPER.
		Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Value.
Total (11 years).....	\$351,338,580	714,833	\$46,650,558	341,520	\$51,113,836	171,770	\$22,540,324	\$231,024,862
1919.....	86,083,063	110,208	10,091,951	76,601	16,169,055	37,458	6,664,462	54,057,595
1918.....	54,170,134	96,739	7,978,296	49,610	8,710,940	29,950	4,828,556	32,652,042
1917.....	46,393,655	93,866	7,580,374	47,274	8,179,898	26,243	3,987,239	26,640,174
1916.....	39,576,870	76,736	4,126,617	62,073	8,009,812	41,837	4,025,388	23,355,662
1915.....	22,264,371	55,161	2,707,020	22,329	2,169,067	18,496	1,667,387	15,720,281
1914.....	20,113,942	60,789	2,983,344	15,130	1,598,960	7,408	522,051	15,038,637
1913.....	21,174,217	43,301	2,105,984	14,059	1,617,285	6,861	590,535	16,890,413
1912.....	21,166,666	55,568	2,690,225	13,462	1,440,992	13,517	1,283,506	16,751,843
1911.....	18,702,151	48,921	2,357,455	13,215	1,278,796	.....	.....	15,065,900
1910.....	17,060,869	124,749	1,198,893	27,693	1,009,061	.....	.....	14,862,855
1909.....	2,832,793	48,740	2,832,793	.....	.....	.....	.....	.....

<sup>1</sup> July 1 to Dec. 31.<sup>2</sup> Newsprint paper and all other printing paper.

# CHAPTER III.—FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF DYE-STUFFS AND EXTRACTS, AND IN TANNING AND WOOD DISTILLATION.

## INTRODUCTION.

This report presents statistics for 1919 of the quantity and cost of wood and other forest products consumed in the manufacture of dyestuffs and extracts, and in wood distillation; also of the quantity and cost of vegetable tanning materials consumed in the United States during that year. Comparable statistics for other specified years are shown except for the manufacture of dyestuffs and extracts. Figures showing the consumption of forest products in that industry for previous years are not available, as detailed data pertaining thereto have not been collected heretofore by the Census Bureau.

WOOD AND OTHER FOREST PRODUCTS USED FOR—	Cost.
Dyestuffs and extracts.....	\$12,133,799
Tanning materials.....	12,027,687
Wood distillation.....	9,559,046

The relative importance of these industries in the use of crude forest products is shown in the preced-

ing statement, which gives the cost at the place of consumption of the various materials used during 1919.

These industries do not make a very great drain on the forest resources of the United States. The wood used in distillation in a large measure comes from slashings, mill waste, and timber not suitable for lumber. Various barks are used to a great extent for tanning materials, and considerable quantities of forest-grown products used in the industry are imported, as are also large quantities of those used for dyestuffs and extracts.

The statistics of capital, employees, wages, and other items for these industries are shown in census reports under separate classifications. Those for wood distillation and for dyestuffs and extracts are presented in connection with the chemical group, while such data for the tanning industry are included with those for the leather group.

## FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF DYESTUFFS AND EXTRACTS.

This report shows the quantity and value of crude forest products consumed in the manufacture of dyestuffs and extracts in 1919 as reported by 53 establishments in the United States. Data pertaining to a number of other establishments engaged in the manufacture of natural dyestuffs and extracts from partially manufactured forest products or vegetable materials are not included. The cost of all materials consumed, as well as other general and special statistics for the industry, are included in the report for the chemical group.

The schedule used for collecting these data called for the quantities of raw materials in cords, tons, or pounds. The quantities reported in pounds were converted into tons of 2,000 pounds, but those which were reported in cords were left to stand as shown, on the assumption that the ton and cord represent substantially the same quantity for such materials. The materials reported in cords were chestnut and Osage orange woods.

Some of the crude forest products reported were used in the manufacture of both dyestuffs and tanning

extracts, and it is impracticable to make a separation of the materials used in the two branches of the industry.

Consumption of raw forest products, by kinds (Table 1).—Chestnut wood is by far the most important native material used in the manufacture of tanning extracts. The native chestnut-oak and hemlock barks are also important materials used for tanning extracts, while black-oak bark is used for both dyestuffs and tanning. Logwood and fustic, imported principally from Mexico, Central America, and the West Indies, are the most important woods used for coloring. Osage orange is a native tree growing principally in southern Arkansas, Oklahoma, and northern Texas and is used to some extent in the manufacture of dyestuffs.

Sumac is used for both dyestuffs and tanning materials, while Brazilwoods and archil are used for dyestuffs. Quebracho woods, spruce rossings, tanbark-oak and wattle barks are used in the manufacture of tanning extracts, as are also divi-divi, gallnuts, gambier, and myrobalans. With the exception of

Osage orange, spruce, and tanbark oak, all of the materials included under "Other" were imported.

TABLE 1.—PRINCIPAL RAW FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF NATURAL DYE STUFFS AND EXTRACTS: 1919.

KIND.	Quantity (tons).	COST.	
		Total.	Average per ton.
Total.....	950,275	\$12,133,799	\$12.77
Chestnut wood.....	754,972	7,040,603	9.33
Chestnut-oak bark.....	61,155	916,391	14.98
Logwood.....	53,861	1,833,034	34.05
Hemlock bark.....	25,504	627,064	24.54
Black-oak bark.....	10,363	134,117	12.95
Sumac leaves.....	5,504	330,071	60.08
Fustic wood.....	5,134	215,227	41.92
Brazilwoods.....	3,175	137,300	43.26
Other <sup>1</sup> .....	30,537	897,782	29.40

<sup>1</sup> Includes Osage orange, and quebracho woods, and spruce rossings, tanbark oak and wattle barks, and archil, divi-divi, gallnuts, gambier, and myrobalans.

Consumption of raw forest products, by states (Table 2).—Virginia led in the consumption of chestnut-oak bark, reporting 76.8 per cent of the total for the United States. This state also reported 38 per cent of the chestnut wood and 13.8 per cent of the logwood consumed in 1919 in this industry. Tennessee reported 40.9 per cent of the total quantity of chestnut wood consumed in the manufacture of tanning extracts in

the United States, and 23.7 per cent of the hemlock bark. Chestnut wood was the only raw material reported in considerable quantity in North Carolina. Pennsylvania led in the consumption of hemlock and black-oak barks, logwood, fustic, and Brazilwoods. The principal materials consumed in West Virginia were chestnut wood, spruce rossings, and chestnut-oak and hemlock barks. New Jersey was prominent in the consumption of logwood, fustic, Brazilwoods, and gambier, and New York in that of logwood, quebracho, and sumac. The principal materials reported for Massachusetts were Brazilwoods, myrobalans, divi-divi, sumac, and gambier.

TABLE 2.—QUANTITY AND COST OF PRINCIPAL RAW FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF NATURAL DYE STUFFS AND EXTRACTS, BY STATES: 1919.

STATE.	Quantity (tons).	Cost.
United States.....	950,275	\$12,133,799
Virginia.....	360,681	3,724,024
Tennessee.....	321,631	3,129,645
North Carolina.....	122,379	1,237,219
Pennsylvania.....	76,175	1,922,434
West Virginia.....	41,483	602,550
New Jersey.....	12,084	478,201
New York.....	12,623	768,000
Massachusetts.....	404	24,130
All other states <sup>1</sup> .....	11,915	267,556

<sup>1</sup> Includes California, Illinois, Maryland, and Michigan.

#### FOREST PRODUCTS CONSUMED IN TANNING.

The principal materials used in tanning are obtained from certain barks, woods, fruits, nuts, etc., which contain an astringent known as tannin. While tannin is found in greater or less quantities in the great majority of the plant species, comparatively few of them have been utilized for tanning purposes. The principal native barks and woods used in 1919 were hemlock and oak barks and chestnut wood. Of the imported tanning materials used, quebracho, myrobalans, divi-divi, sumac, mangrove, and gambier are the most important, although several other kinds are being used in increasing quantities.

While the New England states have been prominent in this industry from its earliest period, the center of activity has shifted southward and westward in accordance with the availability of the supply of raw materials.

The tanneries using bark or wood were usually located near the source of supply of these materials, owing to the cost of transportation involved. The tendency of late years, however, has been for the tanners to buy a large part of the tanning materials in the form of extracts, and consequently the remoteness of the source of tanbark and wood is not so important as the marketing facilities for the finished product.

In 1919 there were 486 establishments in the United States using vegetable tanning materials. Of this number, 72 used bark, wood, and other raw vegetable materials exclusively; 188 used extracts exclusively;

and 226 used both raw materials and extracts. In 1909 the number of establishments was reported as 592, of which 117 used raw vegetable materials exclusively; 138, extracts exclusively; and 337, both raw materials and extracts.

The greater number of establishments in 1909 is due largely to the difference in reporting at the two censuses. The number shown for 1909 represents tanneries, while the number of "establishments" was reported in 1919. An establishment may in some cases represent several plants.

Reports were received from 31 states in 1919, in comparison with 33 states in 1909 and 1907.

Comparative consumption of vegetable tanning materials (Table 3).—The consumption of tanbark, wood, and other raw vegetable materials in tanning has been decreasing for several years. In 1907 the total quantity of such materials used was 1,244,401 tons, and the quantity consumed in 1909 compared with that for 1907 showed a decrease of 11.2 per cent. The decrease in the quantity for the ten-year period from 1909 to 1919 was 43.5 per cent. This decrease was chiefly in the use of hemlock bark.

From 1906 to 1909, inclusive, the quantity of hemlock bark used was more than double that of oak bark, but in 1919 the quantity of oak bark used was only 8 per cent less than the total quantity of hemlock bark. Hemlock has held first place and oak second place for all years for which figures are available, but at the

present rate of decrease in the use of hemlock bark and the tendency of oak to hold its own, it seems altogether likely that oak bark will soon take the lead. In 1919 the cost of oak bark—not including oak and chestnut mixed costing \$649,011—exceeded that of hemlock by \$37,482. The use of chestnut wood in 1919 showed an increase of 13,999 tons as compared with the consumption for 1909. The average cost per ton of tanbark, wood, and other raw materials in 1905 was \$7.46; in 1909, \$10.31; and in 1919, \$19.75.

The statistics for tanning extracts present a striking contrast to those for tanbark, wood, etc., in that there

has been a decrease in the use of the latter but a very marked increase in the quantity and cost of extracts consumed.

The total cost of extracts used in 1906 was equal to about two-thirds the total cost of tanbark, wood, and other raw materials; in 1909 the costs were about equal; but in 1919 the cost of extracts was about three times that of raw materials. The total cost of vegetable tanning extracts used in 1906 was \$8,713,322. The increase from 1906 to 1909 was 23.7 per cent, while the increase from 1909 to 1919 was 220.8 per cent.

TABLE 3.—VEGETABLE TANNING MATERIALS CONSUMED, BY KINDS: 1919 AND 1909.

KIND.	TANBARK, WOOD, ETC.				EXTRACTS.			
	1919		1909		1919		1909	
	Quantity (tons).	Cost.	Quantity (tons).	Cost.	Quantity (pounds).	Cost.	Quantity (pounds).	Cost.
Total.....	609,130	\$12,027,687	1,078,910	\$11,125,750	794,360,977	\$34,579,165	386,817,895	\$10,779,177
Hemlock.....	284,323	4,389,863	698,365	6,434,848	27,034,915	874,142	10,862,540	276,436
Oak.....	1,261,619	15,076,356	324,070	3,533,302	57,869,357	2,312,490	38,419,398	737,220
Chestnut.....	32,520	306,681	18,527	65,152	432,120,247	16,297,017	182,818,961	3,579,929
Myrobalans.....	8,354	488,982	18,000	534,727	2,873,306	96,000	1,101,303	37,571
Divl-divl.....	4,725	381,698			12,772,793	511,794		
Quebracho.....	2,346	244,195			159,320,510	10,740,078	147,109,443	5,877,989
Sumac.....	2,328	203,458			6,669,642	356,923	350,535	16,167
Mangrove.....	2,078	125,750	18,925	514,169	4,988,440	286,437	1,401,008	43,566
Logwood <sup>a</sup> .....	955	110,020			1,579,791	285,397		
Valonia.....	303	22,308			174,504	10,021	243,536	13,022
Gambier.....	189	51,034			4,129,109	647,572	2,641,001	133,765
Spruce.....	150	1,593			48,061,287	756,049		
"Larch" <sup>b</sup> .....					5,976,016	221,544		
All other.....	9,328	625,754	1,023	42,992	30,711,030	1,173,701	1,870,170	58,512

<sup>a</sup> Includes 33,917 tons of oak and chestnut mixed, costing \$649,011.

<sup>b</sup> Includes 31,840,009 pounds of mixed oak and chestnut extract, costing \$1,219,620.

<sup>c</sup> Used for dyeing.

Consumption of tanbark, wood, etc., by states (Table 4).—In 1919; 298 establishments in 28 states reported the consumption of tanbark, wood, etc. Pennsylvania, Michigan, Virginia, and North Carolina each reported a consumption of more than 50,000 tons. The total quantity consumed by these states constituted 58.4 per cent of the total for the United States. In 1909 Pennsylvania, Wisconsin, West Virginia, and Michigan reported 60.5 per cent of the total consumption for that year.

Pennsylvania has been the leading state in the consumption of tanbark for all years for which records are available, while the relative importance of the other states has changed from year to year.

In 1905 the consumption of tanbark, wood, etc., in Pennsylvania was 428,709 tons. This is the largest quantity of record consumed in a single state in any one year.

The leading states in the consumption of these materials in 1919 were Pennsylvania in hemlock, logwood, mangrove, myrobalans, quebracho, sumac, valonia, and "All other"; Michigan in divi-divi; New Jersey in gambier; New York in spruce; North Carolina in chestnut; and Virginia in oak.

The consumption of hemlock bark in Pennsylvania in 1919 was 99,272 tons, and the consumption of oak

bark in Virginia was 64,123 tons. These figures show a marked decrease when compared with 379,806 tons of hemlock consumed in Pennsylvania and 73,871 tons of oak consumed in Virginia in 1905.

TABLE 4.—TANBARK, WOOD, ETC., CONSUMED, BY STATES: 1919 AND 1909.

STATE.	1919		1909	
	Quantity (tons).	Cost.	Quantity (tons).	Cost.
Total.....	609,130	\$12,027,687	1,078,910	\$11,125,750
Pennsylvania.....	142,706	2,969,578	310,279	2,997,026
Michigan.....	79,355	1,618,141	100,285	1,225,655
Virginia.....	71,782	1,222,400	89,580	871,853
North Carolina.....	61,745	962,207	50,683	445,621
Wisconsin.....	38,624	527,502	126,015	1,252,434
California.....	35,213	1,092,185	37,120	744,768
Massachusetts.....	33,947	751,913	28,426	318,133
West Virginia.....	30,857	498,411	115,689	975,683
Tennessee.....	21,495	343,957	25,438	223,247
New York.....	21,433	548,340	81,711	816,885
Maryland.....	11,186	195,246	12,784	132,958
Kentucky.....	9,810	177,835	16,905	177,839
Maine.....	9,710	126,203	12,933	106,513
Ohio.....	8,513	177,428	19,625	229,562
Missouri.....	7,936	142,874	4,183	57,379
Illinois.....	7,888	132,006	16,109	167,926
Georgia.....	4,331	201,065	5,290	52,112
Indiana.....	2,973	55,005	7,668	84,776
New Jersey.....	2,915	143,787	10,368	157,425
All other states <sup>1</sup> .....	7,211	141,513	7,818	87,956

<sup>1</sup> Includes Alabama, Connecticut, Delaware, Louisiana, Minnesota, New Hampshire, Oregon, Texas, and Vermont in 1919; Alabama, Connecticut, New Hampshire, Oregon, Vermont, and Washington in 1909.

Illinois, Indiana, Maryland, Massachusetts, Missouri, New Jersey, New York, North Carolina, and Ohio show gains in the consumption of tanbark in 1919 over that for 1905, but only three states—Massachusetts, Missouri, and North Carolina—show gains in 1919 as compared with 1909, and in these states the gains were very small.

Consumption of tanning extracts (Table 5).—The consumption of tanning extracts was reported by 30 states in 1919. Pennsylvania, Michigan, New York, West Virginia, New Jersey, North Carolina, and Massachusetts, ranking in the order named, used 76.9 per cent of the total quantity of extracts reported for the United States.

The consumption of tanning extracts has greatly increased since 1905. In that year the reported consumption was 146,199,500 pounds; in 1907, 364,899,535 pounds; in 1909, 386,817,895 pounds; and in 1919, 794,360,977 pounds; the percentage of increase being 149.6 per cent from 1905 to 1907, 6 per cent from 1907 to 1909, and 105.4 per cent from 1909 to 1919.

In these statistics is shown the total weight of both solid and liquid extracts consumed in specified years. These extracts contain various proportions of tannin, ranging from about 25 per cent for liquids to about 65 per cent for solids.

The average cost per pound of extract for 1907 was 2.6 cents; for 1909, 2.8 cents; and for 1919, 4.4 cents.

TABLE 5.—TANNING EXTRACTS CONSUMED, BY STATES: 1919 AND 1909.

STATE.	1919		1909	
	Quantity (pounds).	Cost.	Quantity (pounds).	Cost.
Total.....	794,360,977	\$34,579,165	386,817,895	\$10,779,177
Pennsylvania.....	250,462,839	10,563,754	124,742,847	3,665,942
Michigan.....	83,304,089	3,443,442	25,608,343	762,357
New York.....	76,043,605	3,350,320	30,996,721	991,366
West Virginia.....	59,694,886	2,302,193	27,665,815	857,668
New Jersey.....	47,778,121	2,370,993	18,609,877	526,628
North Carolina.....	45,110,980	1,061,167	19,948,938	326,284
Massachusetts.....	41,435,783	2,790,733	28,164,770	823,205
Kentucky.....	31,365,911	1,182,239	18,695,512	397,616
Wisconsin.....	31,052,162	1,824,876	23,595,933	725,181
Virginia.....	30,899,385	1,222,353	17,312,680	277,498
Ohio.....	27,381,464	1,338,355	14,795,808	397,157
Tennessee.....	12,717,565	504,769	4,962,000	94,429
Illinois.....	7,518,433	612,288	4,564,572	144,433
Missouri.....	7,072,798	204,730	1,298,767	41,631
Maine.....	6,080,464	248,093	5,583,400	100,038
Indiana.....	6,076,871	270,531	7,710,009	166,370
Maryland.....	6,008,632	369,966	4,370,843	106,663
New Hampshire.....	4,712,959	237,838	(1)	(1)
California.....	4,084,976	243,226	3,299,121	160,731
Minnesota.....	934,600	54,122	957,435	27,061
Connecticut.....	669,547	46,175	(1)	(1)
Delaware.....	372,811	74,051	(1)	(1)
All other states <sup>1</sup> .....	5,831,020	172,340	6,037,434	197,544

<sup>1</sup> Included in "All other states."

<sup>2</sup> Includes Alabama, Colorado, Georgia, North Dakota, Oregon, Texas, Vermont, and Washington in 1919; Alabama, Colorado, Connecticut, Delaware, Georgia, Iowa, Louisiana, New Hampshire, North Dakota, Oregon, South Dakota, Texas, Vermont, and Washington in 1909.

#### WOOD CONSUMED IN DISTILLATION.

The manufacture of charcoal by carbonization is an old industry, but the present methods of wood distillation for the purpose of recovering the volatile products are comparatively modern and the industry in the United States dates from about the middle of the nineteenth century.

Two distinct processes are employed to secure the several volatile distillates or other crude products—the destructive process and the steam-solvent process. In the former process the wood is heated to such a temperature that the fiber is destroyed and new products created. In the latter the volatile and soluble substances are removed from the wood by the use of steam and solvents, which do not destroy the fiber.

The industry is divided into two distinct branches—hardwood distillation and softwood distillation. Measured by the quantity of wood used, the hardwood branch is by far the more important, consuming 82.2 per cent of the total quantity of wood used for distillation in the United States in 1919. This branch is confined practically to the Northern and Central states, where the supply of suitable wood is more abundant. Softwood distillation is carried on largely in the South Atlantic and Gulf states, and the southern longleaf pine is the principal

raw material used in this industry which requires resinous woods.

The wood-distillation industry compared with the lumber industry is of minor importance as a consumer of timber or as a drain on the forest resources of the Nation. However, in 1919 approximately 750 million board feet of wood were used in distillation.

Several important establishments manufacturing wood-distillation products are operated in connection with the manufacture of lumber. These plants utilize the slabs and other waste products of the sawmill or timber camp. A considerable quantity of wood waste which might have been available for distillation is, however, destroyed or discarded.

Comparative consumption of wood (Table 6).—Statistics for the wood-distillation industry were first published by the Bureau of the Census for 1879, in which year 17 establishments were engaged in the manufacture of acetate of lime and crude wood alcohol. In 1890 the number of establishments had increased to 53. Data pertaining to the quantity of wood consumed are not available for these two years. Statistics showing the number of establishments and the consumption of wood for each year for which data are available are shown in Table 6.

The number of establishments shown in the table is not strictly comparable on account of the different methods of reporting for the various censuses. From 1905 to 1911 the number of plants was reported, while for the other years the number of establishments is given. As a rule, the term "establishment" represented a single plant or factory, but in some cases it represented two or more plants which were operated under a common ownership and for which one set of books of account was kept.

TABLE 6.—WOOD CONSUMED IN DISTILLATION, FOR SPECIFIED YEARS: 1899-1919.

YEAR.	NUMBER OF ESTABLISHMENTS.			QUANTITY (CORDS).		
	Total. <sup>1</sup>	Hardwoods.	Softwoods.	Total.	Hardwoods.	Softwoods.
1919.....	112	87	25	1,442,675	1,186,477	256,198
1914.....	101	86	15	1,042,617	970,308	72,209
1911.....	135	105	30	1,221,359	1,058,955	162,404
1910.....	147	117	30	1,450,439	1,257,997	192,442
1909.....	147	116	31	1,265,157	1,149,347	115,310
1908.....	131	101	30	977,844	878,632	99,212
1907.....	131	100	31	1,282,120	1,219,771	62,349
1906.....	119	88	33	1,195,130	1,144,896	50,234
1905.....	82	67	15	676,739	659,770	16,969
1904.....	150	119	31	1,049,503	1,018,072	31,431
1899.....	111	107	4	490,939	487,805	3,134

<sup>1</sup> Includes 1 establishment in 1919 and 6 in 1914 engaged primarily in other industries.

#### HARDWOOD DISTILLATION.

Consumption of wood, by states (Table 7).—The relative importance of the states engaged in hardwood distillation from the standpoint of wood consumed has remained about the same from year to year, the leading states being Michigan, Pennsylvania, and New York. In 1919 these three states consumed 87.2 per cent of the total quantity of hardwoods used in distillation.

TABLE 7.—HARDWOODS CONSUMED IN DISTILLATION, BY STATES: 1919.

STATE.	Number of establishments.	QUANTITY.		COST.	
		Cords.	Per cent distribution.	Total.	Average per cord.
United States.....	87	1,180,477	100.0	\$7,965,069	\$6.71
Michigan.....	15	648,910	54.7	4,307,797	6.64
Pennsylvania.....	42	281,320	23.7	1,832,795	6.69
New York.....	20	104,493	8.8	747,882	7.16
Wisconsin.....	3	60,544	5.1	519,131	8.57
All other states <sup>1</sup> .....	7	91,210	7.7	1,507,464	5.56

<sup>1</sup> Includes 1 establishment engaged in wood distillation, but primarily operating a blast furnace.

<sup>2</sup> Includes establishments distributed as follows: Alabama, 1; Connecticut, 1; Kentucky, 1; Mississippi, 1; Missouri, 1; Tennessee, 1; and West Virginia, 1.

Beech, birch, and maple have been the principal hardwoods used for all years for which records are available. A few other species have been used from time to time, but they have been of less importance, and in many instances not reported separately. In

1919 the hardwoods reported under "All other" included alder, ash, cherry, elm, gum, chestnut, hickory, ironwood, oak, and a few kinds not specified.

Products.—The principal basic products obtained from the hardwoods by distillation are crude wood alcohol, charcoal, acetates, tar, and tar oils, and the quantity of each that a cord of wood will yield depends largely on the kind and efficiency of the equipment used. Many of the plants are converting their primary products into more highly manufactured forms and some products that were wasted in the early stages of the industry are now saved. Of the crude wood alcohol produced, 6,980,693 gallons were produced for sale and 2,123,303 gallons were consumed by the establishments reporting in the manufacture of refined wood alcohol and other derived products, such as formaldehyde, acetone, methyl acetone, ketone, etc. A considerable quantity of charcoal was reported as produced and consumed by establishments operating blast furnaces. Statistics pertaining to the refined or remanufactured products are presented in the report for the chemical group.

The quantities of the principal basic products of the hardwood-distillation industry for 1919 are shown in the following statement:

KIND.	Quantity.
Crude wood alcohol.....	gallons.. 19,103,996
Acetate of lime.....	pounds.. 168,956,432
Charcoal.....	bushels.. 46,354,342
Tar.....	gallons.. 552,124
Tar oils.....	gallons.. 222,398
Wood creosote.....	pounds.. 945,605

<sup>1</sup> Includes a small amount of wood alcohol manufactured from softwoods.

#### SOFTWOOD DISTILLATION.

Consumption of wood, by states (Table 8).—The consumption of wood in the softwood branch of the industry was greater in 1919 than for any other year for which records are available.

Georgia was the leading state in the quantity of softwoods distilled in 1905, 1908, and 1919, North Carolina in 1906 and 1907, and Alabama, in 1909. Florida has held second place for all years of record since 1906. The plants in the various states reporting softwood distillation in 1919 were located mainly in counties bordering on the Atlantic Ocean or the Gulf of Mexico.

The principal wood used in this industry is long-leaf yellow pine, although other resinous woods have been used in limited quantities. In 1908 the use of Douglas fir was reported to the extent of 974 cords, and Norway pine in the Lake states has also been used for distillation.

The successive canvasses since 1899 show increases in the quantity of softwoods used, except for the years 1905, 1911, and 1914.

TABLE 8.—SOFTWOODS CONSUMED IN DISTILLATION, BY STATES: 1919.

STATE.	Number of establishments.	QUANTITY.		COST.	
		Cords.	Per cent distribution.	Total.	Average per cord.
United States.....	25	256,198	100.0	\$1,593,977	\$6.22
Georgia.....	7	103,064	40.6	591,576	5.40
Florida.....	6	85,065	33.0	618,743	7.19
Alabama.....	3	41,416	16.2	264,912	6.40
Louisiana.....	14	18,005	7.0	95,788	5.32
All other states.....	5	6,748	2.6	52,958	7.85

<sup>1</sup> Includes 1 establishment distilling sawdust.

<sup>2</sup> Includes establishments distributed as follows: Michigan, 1; Mississippi, 1; North Carolina, 2; and Texas, 1.

**Products.**—The principal products obtained from distilling the softwoods are rosin, turpentine, tar, tar oils, charcoal, and wood creosote.

It is interesting to note that rosin, one of the most important products of softwood distillation in 1919, was classed with "All other" as a minor product for previous years.

The quantities of the principal products of the softwood-distillation industry for 1919 are shown in the following statement:

KIND.	Quantity.
Rosin.....barrels (280 pounds).....	234,030
Turpentine.....gallons.....	1,534,333
Tar.....gallons.....	2,125,757
Tar oils.....gallons.....	581,042
Charcoal.....bushels.....	1,702,103
Wood creosote.....pounds.....	207,050

#### EQUIPMENT.

The wood-distillation industry has gone through several stages of development since it was established in the United States.

Brickkilns were first employed to recover the condensable gases which were lost in burning charcoal in

the old wasteful pits. This kind of equipment is still being utilized, but a great step forward was made when the use of cylindrical iron retorts, built in pairs, was inaugurated. Large rectangular ovens or retorts represent a still later improvement, and these are being installed in many of the larger plants in place of the cylindrical iron retorts.

The schedule used for collecting data for wood-distillation equipment for 1919 called for the number and capacity of retorts and ovens separately, but many of the reporting establishments did not distinguish between retorts and ovens, consequently the data are combined in Table 9. The small retorts were generally used in New York, North Carolina, and Pennsylvania while the ovens or oven retorts were used largely in Georgia, Michigan, and Wisconsin.

TABLE 9.—EQUIPMENT: 1919.

STATE.	KIND AND CAPACITY OF EQUIPMENT.					
	Ovens and retorts.		Kilns.		Steam extractors.	
	Number.	Total capacity per day (cords).	Number.	Total capacity per charge (cords).	Number.	Total capacity per day (cords).
United States.....	1,067	5,148	167	10,070	132	870
Hardwood distillation.....	800	4,614	167	10,070	.....	.....
Michigan.....	180	1,282	130	8,200	.....	.....
New York.....	235	605	.....	.....	.....	.....
Pennsylvania.....	373	1,098	12	120	.....	.....
Wisconsin.....	10	82	25	1,750	.....	.....
All other states <sup>1</sup> .....	62	587	.....	.....	.....	.....
Softwood distillation.....	207	534	.....	.....	132	870
Alabama.....	20	10	.....	.....	60	150
Florida.....	20	100	.....	.....	40	320
Georgia.....	76	306	.....	.....	22	353
Louisiana.....	32	40	.....	.....	8	17
All other states <sup>2</sup> .....	50	78	.....	.....	2	20

<sup>1</sup> Includes Alabama, Connecticut, Kentucky, Mississippi, Missouri, Tennessee, and West Virginia.

<sup>2</sup> Includes Michigan, Mississippi, North Carolina, and Texas.

## CHAPTER IV.—TURPENTINE AND ROSIN.

### GENERAL STATISTICS.

**General character of the industry.**—This report presents statistics for establishments engaged in the production of spirits of turpentine and rosin by the distillation of the semifluid exudation of certain species of pine trees. The crude materials are variously designated as crude gum, crude turpentine, and resin. The free-flowing sap which collects in the cup or box at the base of the tree is called "dip" and the gum or resin adhering to the chipped surface of the tree is called "scrape."

The crude gum is derived principally from the long-leaf pine (*Pinus palustris*) which is indigenous to the coastal area extending from North Carolina to eastern Texas; and to a less extent from the Cuban or slash pine (*Pinus caribaea*) and the loblolly pine (*Pinus taeda*). A relatively small quantity of turpentine is obtained from pine wood by destructive distillation or by the steam process. The establishments, 22 in number in 1919, which produced turpentine in this manner are treated as belonging to the wood-distillation industry, and the statistics therefor are not included in this report except in connection with the presentation of data for total production (see note 1, Table 12).

Crude turpentine was collected by the early settlers of the eastern coast of Virginia and the Carolinas by practically the same method of boxing the trees as is employed to-day. They also extracted tar and pitch from resinous pine wood by means of sod-covered kilns or pits. The products were extensively used in the construction of wooden sailing vessels and boats and for that reason they were called "naval stores." The use of that term has been extended to cover not only tar and pitch, which are wood-distillation products, but also spirits of turpentine and rosin. In recent years the demand for tar and pitch in the ship and boat building industry has diminished owing to the displacement of wood by iron and steel. Spirits of turpentine and rosin are now used chiefly in the manufacture of such commodities as paint, oil, varnish, soap, paper, rubber, oilcloth, linoleum, sealing wax, fly paper, printing ink, lubricating compounds, medicinal preparations, and in cloth printing.

**Importance and growth of the industry.**—Table 1 summarizes the more important data relative to the industry for the censuses from 1879 to 1919 and gives the percentages of increase or decrease for each census.

The large increases, from 1914 to 1919, in salaries and wages, in cost of materials used, and in value of products are due to the general rise in the cost of labor and commodities during and following the World War and do not, therefore, fairly measure the growth of the industry during that period. The addition of the

Federal income tax since 1914 accounts for the large increase in "Rent and taxes."

The relatively small cost of materials, 26.3 per cent in 1919, as compared with the value of products is due to the fact that in this industry the greater part of the cost of the materials is the compensation of the employees engaged in gathering the crude gum and is reported under the head of "Wages."

The decrease of 14.6 per cent in the number of establishments during the five-year period 1914-1919 may be attributed primarily to the diminution in the supply of pine timber in turpentine-producing states.

The increase of 152.7 per cent in the value of products for 1919 compared with 1914 was due to the increase in unit values, as the production of spirits of turpentine decreased 9,287,140 gallons and that of rosin decreased 851,755 barrels.

**States, ranked by value of products.**—Table 2 presents statistics pertaining to wage earners and products for the eight states producing naval stores, arranged according to their rank in production.

In 1849 the industry was largely confined to the eastern part of North Carolina, which continued to be the leading state until 1879, when it was outranked by South Carolina. In 1889 and 1899 Georgia led in value of products, but at the last four censuses Florida has ranked first and Georgia second, while North Carolina has dropped from first place during the early period of the industry in the United States to eighth place, producing in 1919 only about three-tenths of 1 per cent of the total output.

**Persons engaged in the industry.**—Table 3 shows, for 1919, 1914, and 1909, the number of persons engaged in the industry distributed by class and sex, the average number of wage earners also being shown separately for persons 16 years of age and over and persons under 16 years of age. The age classification of the average number of wage earners is an estimate obtained by the method described in the "Explanation of terms." The classification by sex for 1919 was reported separately but for 1914 and 1909 was obtained in the same manner as the distribution by age.

**Wage earners, by months.**—The statistics for wage earners in Table 4 show the steadiness of employment, or the reverse, in accordance with the industrial conditions as they existed during the several census years. The turpentine and rosin industry is seasonal, the work being distributed as follows: Cutting boxes and hanging cups during the winter months, chipping and dipping in the spring and summer, and scraping and raking in the early fall. The largest number of wage earners is employed during the chipping and dipping season, the maximum force being required at

that time to gather the gum, to operate the distilleries, and to handle the products.

**Prevailing hours of labor.**—In the turpentine and rosin industry, the piece-work system of wage payments is in general use, and the woodsmen usually work irregular hours. The classification of employees on the basis of prevailing hours of labor is therefore of doubtful significance. Figures presented in Table 5, however, indicate a tendency toward the shortening of the working-day of the wage earner.

**Size of establishments, by average number of wage earners.**—The number of establishments which did not employ any wage earners increased during the two census periods shown in Table 6. This fact may be due to the stimulus caused by the great increases in the unit values of the products which were urgently needed during the war, the increased prices undoubtedly being sufficiently attractive for a number of small operators to engage in the industry. The only other group showing an increase from 1914 to 1919 is the group employing from 101 to 250 wage earners.

**Size of establishments, by value of products.**—The tendency of the industry to become concentrated in large establishments, or the reverse, is indicated by the statistics shown in Table 7.

Of the 105 establishments which for 1919 reported products valued at more than \$100,000 each, 42 were located in Florida, 22 in Louisiana, 21 in Mississippi, 8 in Alabama, 7 in Georgia, and 5 in Texas.

**Character of ownership.**—The tendency toward the corporate form of ownership in this industry is shown in Table 8 by the increased proportion of the total number of wage earners and the total value of products reported by this group. Nearly one-half of the number of establishments reported in 1919, however, were operated by individuals, and individual ownership predominated in all but three states—Louisiana, Mississippi, and Texas.

**Number and horsepower of types of prime movers.**—Little mechanical power is required for this industry, many establishments reporting none. The total primary power, as shown in Table 9, decreased 1,651 horsepower, or 40 per cent, from 1909 to 1914, and 165 horsepower, or 6.7 per cent, from 1914 to 1919. Practically all of the power is derived from steam engines and internal-combustion engines. The use of the latter type is increasing.

**Fuel consumed.**—The principal fuel used in this industry is wood, chiefly waste timber, the quantity of which was not reported.

TABLE 1.—COMPARATIVE SUMMARY: 1919, 1914, 1909, 1904, 1899, 1889, AND 1879.

	1919	1914	1909	1904	1899	1889	1879	PER CENT OF INCREASE. <sup>1</sup>					
								1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
Number of establishments.....	1,101	1,304	1,585	1,287	1,503	670	508	-14.6	-12.1	23.2	-14.4	124.8	31.9
Persons engaged.....	31,003	38,204	44,524	37,520	45,945	(2)	(2)	-18.8	-14.0	18.6	-18.3	.....	.....
Proprietors and firm members..	1,400	1,621	2,507	1,997	2,192	(4)	(2)	-9.9	-36.9	28.5	-8.0	.....	.....
Salaried employees.....	1,580	1,856	2,440	2,147	1,889	(2)	(2)	-15.6	-24.1	18.9	13.7	.....	.....
Wage earners (av. number)....	28,007	34,817	39,511	33,382	41,804	15,266	10,535	-19.4	-11.9	18.4	-20.3	174.2	44.9
Primary horsepower.....	2,303	2,478	4,129	1,175	860	(2)	(2)	-7.1	-40.0	251.4	35.7	.....	.....
Capital.....	\$33,595,986	\$20,744,872	\$12,400,978	\$6,961,185	\$11,847,495	\$4,062,375	\$1,866,300	61.9	67.3	78.1	-41.2	191.6	117.7
Salaries and wages.....	\$19,215,737	\$10,017,385	\$11,018,750	\$9,534,922	\$9,172,177	\$2,933,401	\$1,623,061	91.8	-9.1	15.6	4.0	212.7	80.7
Salaries.....	\$2,242,856	\$1,434,415	\$1,085,301	\$1,152,222	\$778,694	(3)	(3)	50.4	-13.3	43.7	48.0	.....	.....
Wages.....	\$16,972,881	\$8,582,970	\$9,933,350	\$8,382,700	\$8,393,483	(4)	(2)	97.8	-8.3	11.7	-0.1	188.8	.....
Paid for contract work.....	\$425,407	\$532,143	\$958,000	\$51,843	\$100,300	.....	.....	-20.1	-19.1	1,100.2	-67.7	.....	.....
Rent and taxes.....	\$854,328	\$192,027	\$193,617	\$302,502	\$309,932	.....	.....	344.0	-0.8	209.8	-37.3	.....	.....
Cost of materials.....	\$13,929,888	\$5,535,661	\$4,019,838	\$3,774,937	\$6,186,492	\$2,874,693	\$2,324,637	151.6	12.7	30.1	-39.0	115.2	23.7
Value of products.....	\$33,051,294	\$20,960,191	\$25,205,017	\$23,937,024	\$20,344,388	\$5,977,379	\$5,876,983	152.7	-17.0	5.7	17.7	151.9	37.4
Value added by manufacture <sup>6</sup> .....	\$39,121,406	\$15,454,030	\$20,384,179	\$20,162,357	\$14,188,396	\$5,202,680	\$3,552,340	153.1	-24.2	1.1	42.4	172.1	46.5
Quantity of principal products:													
Spicils of turpentine (gals.).....	17,693,841	26,980,981	28,088,954	30,687,051	37,733,500	(2)	(2)	-34.4	-6.9	-5.5	-18.7	.....	.....
Rosin (bbls. of 280 lbs. gross)...	2,033,322	2,885,077	3,263,867	3,508,347	4,348,094	(2)	(2)	-20.5	-11.0	-7.0	-19.3	.....	.....

<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Figures not available.

<sup>3</sup> The capital reported for 1899 included timber land, valued at \$5,022,040.

<sup>4</sup> Exclusive of internal revenue.

<sup>5</sup> Value of products less cost of materials.

TABLE 2.—STATES, RANKED BY VALUE OF PRODUCTS: 1919.

STATE.	Number of establishments.	WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.		
		Average number.	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.
United States.....	1,101	28,007	100.0	.....	\$53,051	100.0	.....	\$30,121	100.0	.....
Florida.....	452	11,748	41.9	1	21,509	40.5	1	15,650	40.0	1
Georgia.....	441	7,078	25.2	2	10,875	20.5	2	7,930	20.3	2
Alabama.....	174	3,014	10.7	3	5,892	11.1	3	4,108	10.5	5
Louisiana.....	33	2,604	9.3	4	5,591	10.5	4	4,211	10.8	4
Mississippi.....	45	2,405	8.9	5	5,548	10.5	5	4,257	10.9	3
Texas.....	10	1,013	3.6	6	3,301	6.2	6	2,783	7.1	6
South Carolina.....	22	84	0.3	7	168	0.3	7	105	0.8	7
North Carolina.....	14	26	0.1	8	167	0.3	8	77	0.2	8

# TURPENTINE AND ROSIN.

**TABLE 3.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.**

CLASS.	Cen- sus year.	Total.	Male.	Fe- male.	PER CENT OF TOTAL.		CLASS.	Cen- sus year.	Total.	Male.	Fe- male.	PER CENT OF TOTAL.		
					Male.	Fe- male.						Male.	Fe- male.	
All classes.....	1910	31,093	30,954	139	99.6	0.4	Clerks and other subordinate salaried employees.	1919	219	214	5	97.7	2.3	
	1914	38,294	38,198	96	99.7	0.3			1914	551	543	8	98.5	1.5
	1909	44,524	44,426	98	99.8	0.2			1909	1,300	1,296	4	99.7	0.3
Proprietors and officials.....	1919	2,807	2,779	28	99.0	1.0	Wage earners (average number).....	1919	28,067	27,961	106	99.6	0.4	
	1914	2,926	2,906	20	99.3	0.7			1914	34,817	34,749	68	99.8	0.2
	1909	3,713	3,683	30	99.2	0.8			1909	39,511	39,447	64	99.8	0.2
Proprietors and firm members.....	1919	1,460	1,433	27	98.2	1.8	16 years of age and over.....	1919	27,694	27,590	104	99.6	0.4	
	1914	1,621	1,601	20	98.8	1.2			1914	34,358	34,293	65	99.8	0.2
	1909	2,567	2,537	30	98.8	1.2			1909	38,918	38,861	57	99.9	0.1
Salaried officers of corporations....	1919	149	149	.....	100.0	.....	Under 16 years of age.....	1919	373	371	2	99.5	0.5	
	1914	117	117	.....	100.0	.....			1914	459	456	3	99.3	0.7
	1909	80	80	.....	100.0	.....			1909	593	586	7	98.8	1.2
Superintendents and managers....	1919	1,198	1,197	1	99.9	0.1								
	1914	1,188	1,188	.....	100.0	.....								
	1909	1,060	1,060	.....	100.0	.....								

**TABLE 4.—WAGE EARNERS, BY MONTHS AND BY STATES: 1919.**

[The month of maximum employment for each state is indicated by bold-faced figures and that of minimum employment by *italic* figures.]

STATE.	Average number em- ployed during year.	NUMBER EMPLOYED ON THE 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY.												Per cent mini- mum is of maxi- mum.
		Janu- ary.	Febru- ary.	March.	April.	May.	June.	July.	August.	Sep- tember.	Octo- ber.	Novem- ber.	Decem- ber.	
United States:														
1919.....	28,067	<b>85,018</b>	26,756	27,548	28,537	28,723	28,802	28,664	28,692	28,319	28,617	28,296	27,932	90.0
Males.....	27,961	<b>85,806</b>	26,609	27,391	28,406	28,652	28,729	28,569	28,602	28,227	28,515	28,184	27,642	89.8
Females.....	106	<i>112</i>	147	157	131	71	73	95	90	92	102	112	90	45.2
1914.....	34,817	<b>88,717</b>	33,984	35,759	37,408	37,787	37,647	37,579	35,747	34,031	32,608	31,150	30,407	80.5
1909.....	30,511	<b>57,118</b>	37,340	39,489	39,974	40,378	40,555	40,634	40,378	40,378	39,749	39,597	39,343	91.3
Alabama.....	3,014	<b>8,784</b>	2,814	2,911	3,007	3,036	3,092	3,121	3,149	3,143	3,096	3,035	2,980	88.4
Florida.....	11,748	<b>10,538</b>	11,013	11,322	11,918	12,038	12,161	12,068	12,147	11,878	12,162	11,903	11,784	87.0
Georgia.....	7,078	<b>6,763</b>	6,952	6,921	6,999	7,069	7,091	7,250	7,160	7,109	7,176	7,211	7,235	93.3
Louisiana.....	2,604	<b>8,834</b>	2,401	2,536	2,583	2,605	2,522	2,639	2,655	2,637	2,795	2,806	2,835	78.8
Mississippi.....	2,495	<b>2,201</b>	2,248	2,486	2,646	2,623	2,572	2,682	2,685	2,662	2,495	2,451	2,189	81.5
North Carolina.....	26	<b>80</b>	80	21	22	27	28	28	28	29	29	30	30	66.7
South Carolina.....	84	<b>71</b>	76	82	82	81	84	91	89	86	87	87	92	77.2
Texas.....	1,018	<b>1,263</b>	1,282	1,269	1,280	1,244	1,252	785	779	775	777	773	787	60.4

**TABLE 5.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, BY STATES: 1919 AND 1914.**

STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							
			44 and under.	Between 44 and 48.	48. <sup>1</sup>	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States.....	1919	28,067	7,336	445	3,706	2,509	4,430	508	9,098	35
	1914	34,817	( <sup>3</sup> )	( <sup>3</sup> )	13,680	2,770	728	780	15,995	864
	1909	30,511	( <sup>3</sup> )	( <sup>3</sup> )	14,786	2,647	1,022	280	19,607	1,169
Alabama.....	1919	3,014	543	128	121	611	325	66	1,220	.....
	1914	3,411	( <sup>3</sup> )	( <sup>3</sup> )	2,027	144	152	40	919	129
Florida.....	1919	11,748	3,870	275	1,122	1,304	2,171	130	2,858	18
	1914	15,466	( <sup>3</sup> )	( <sup>3</sup> )	5,883	1,155	476	255	7,294	403
Georgia.....	1919	7,078	1,341	23	2,220	528	892	294	1,763	12
	1914	9,118	( <sup>3</sup> )	( <sup>3</sup> )	2,953	868	90	419	4,700	88
Louisiana.....	1919	2,604	1,306	.....	221	30	290	.....	757	.....
	1914	2,472	( <sup>3</sup> )	( <sup>3</sup> )	1,187	170	.....	.....	948	167
Mississippi.....	1919	2,495	49	14	4	19	259	.....	2,150	.....
	1914	3,275	( <sup>3</sup> )	( <sup>3</sup> )	1,494	405	9	50	1,240	77
North Carolina.....	1919	26	1	.....	.....	3	.....	18	4	.....
	1914	45	( <sup>3</sup> )	( <sup>3</sup> )	.....	9	.....	1	27	.....
South Carolina.....	1919	84	2	.....	2	14	.....	.....	61	5
	1914	221	( <sup>3</sup> )	( <sup>3</sup> )	127	20	.....	16	58	.....
Texas.....	1919	1,018	224	.....	16	.....	493	.....	285	.....
	1914	809	.....	.....	.....	.....	.....	.....	809	.....

<sup>1</sup> Includes 48 and under for 1914 and 1909.

<sup>2</sup> Corresponding figures not available.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, BY STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—													
	Estab-lish-ments.	Wage earners (average number).	No wage earners.		1 to 5 wage earners, inclusive.		6 to 20 wage earners, inclusive.		21 to 50 wage earners, inclusive.		51 to 100 wage earners, inclusive.		101 to 250 wage earners, inclusive.		251 to 500 wage earners, inclusive.	
			Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.
United States. 1919	1,191	28,067	37	179	522	551	7,171	330	10,446	60	4,325	30	4,305	4	1,181	
1914	1,394	34,817	21	218	620	631	8,569	419	13,409	77	5,561	20	3,293	8	1,381	
Alabama.....	174	3,014	4	37	111	82	914	43	1,346	7	506	1	137			
Florida.....	452	11,748	7	41	144	107	2,744	173	5,384	22	1,501	11	1,446	2		
Georgia.....	441	7,078	18	72	226	250	3,220	90	2,808	9	575	2	250			
Louisiana.....	33	2,004				2	34	11	389	11	814	9	1,307			
Mississippi.....	45	2,495	1	7	12	11	145	9	342	10	859	6	861	1		
North Carolina.....	14	26	3	10	14	1	12									
South Carolina.....	22	84	4	12	10	6	68									
Texas.....	10	1,018				2	34	5	177	1	70	1	244	1		

<sup>1</sup> Includes 1 establishment with 730 wage earners.

TABLE 7.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS: 1919, 1914, AND 1909.

VALUE OF PRODUCT.	NUMBER OF ESTABLISHMENTS.			AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE		
	1919	1914	1909	1919	1914	1909	1919	1914	1909	1919	1914	1909
All classes.....	1,191	1,394	1,535	28,067	34,817	30,511	\$53,051,204	\$20,900,191	\$25,295,017	\$30,121,406	\$15,454,030	\$20,384,
Less than \$5,000.....	101	357	249	105	2,370	1,409	279,601	1,076,043	775,812	181,000	730,684	630,
\$5,000 to \$20,000.....	395	800	971	3,084	15,987	10,201	5,050,453	8,404,419	11,210,577	3,594,027	6,152,268	8,935,
\$20,000 to \$100,000.....	590	217	355	14,308	11,232	10,412	24,805,020	7,888,112	11,018,484	18,100,200	5,033,019	9,594,
\$100,000 and over.....	105	20	10	0,850	5,228	2,420	22,855,530	3,531,017	1,684,144	17,172,700	2,637,759	1,325,
PER CENT DISTRIBUTION.												
All classes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than \$5,000.....	8.5	25.0	15.7	0.6	6.8	3.6	0.5	5.1	3.1	0.5	4.7	
\$5,000 to \$20,000.....	33.2	57.4	61.3	13.1	45.9	48.7	9.5	40.5	44.3	9.2	39.8	
\$20,000 to \$100,000.....	49.5	15.6	22.4	51.2	32.3	41.5	46.9	37.0	45.0	40.4	38.4	
\$100,000 and over.....	8.8	1.4	0.6	35.1	15.0	6.1	43.1	10.8	6.7	43.9	17.1	

TABLE 8.—CHARACTER OF OWNERSHIP, BY STATES: 1919 AND 1914.

STATE.	Cen-sus year.	NUMBER OF ESTABLISHMENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.						VALUE OF PRODUCTS.						
		Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Total.	In establishments owned by—			Per cent of total.			Total.	Of establishments owned by—			Per cent of to	
						Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.		Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Indi-vid-u-als.	Cor-pora-tions.
United States...	1919	547	247	307	28,067	7,788	11,552	8,777	27.6	41.2	31.3	\$53,051,204	\$12,011,421	\$24,040,448	\$15,403,425	23.8	47.0
	1914	552	221	321	34,817	8,571	12,812	13,434	24.6	36.8	38.6	20,900,191	4,731,380	8,402,030	7,850,700	22.5	40.0
	1909	509	166	790	30,511	11,022	9,130	10,359	27.9	29.1	40.0	25,295,017	6,006,127	8,144,056	12,184,834	27.5	24.3
Alabama.....	1919	89	20	50	3,014	957	1,151	906	31.8	38.2	30.1	5,892,492	1,795,930	2,353,317	1,743,236	30.5	39.9
	1914	74	24	62	3,411	1,175	881	1,355	34.4	25.8	39.7	2,047,132	642,881	540,710	857,511	31.4	26.7
Florida.....	1919	175	107	170	11,748	3,502	4,257	3,980	29.8	36.2	34.0	21,508,553	5,602,083	8,428,067	7,387,803	26.5	39.2
	1914	153	100	255	15,466	3,425	5,292	6,749	22.1	34.2	43.0	9,578,068	3,588,009	4,023,700	4,023,700	20.5	37.5
Georgia.....	1919	244	46	151	7,078	3,004	774	3,240	43.3	10.9	45.8	10,874,714	4,609,655	1,320,380	4,044,670	42.4	12.1
	1914	254	42	206	9,118	3,440	835	4,834	37.8	9.2	53.0	4,607,500	1,004,126	447,030	2,465,828	30.8	9.7
Louisiana.....	1919	2	30	1	2,604	64	2,310	221	2.5	89.1	8.5	5,591,280	67,719	5,040,448	483,122	1.2	90.1
	1914	4	17	0	2,472	80	2,203	99	3.2	92.8	4.0	1,858,391	60,099	1,709,584	82,708	3.0	92.0
Mississippi.....	1919	6	25	14	2,495	76	2,047	372	3.0	82.0	14.9	5,547,813	195,307	4,517,064	834,842	3.5	81.4
	1914	16	30	15	3,275	233	2,770	272	7.1	84.6	8.3	1,997,180	155,842	1,552,057	280,240	7.8	77.7
North Carolina.....	1919	12	1	1	26	23	2	1	88.5	7.7	3.8	167,410	133,810	10,200	17,400	79.9	9.7
	1914	25	2	8	45	29		1	64.4		35.6	146,681	107,934		138,747	73.0	
South Carolina.....	1919	19		3	84	52		32	61.9		38.1	168,383	116,908		51,475	69.4	
	1914	20	2	7	221	180		41	81.4		18.6	151,801	103,130		148,671	67.9	
Texas.....	1919		9	1	1,018		1,002	16			98.4	3,300,640		3,200,772	30,868		99.1
	1914		4	2	809		800				100.0	608,374		608,374			100.0

<sup>1</sup> Includes the group "Corporations."

<sup>2</sup> Includes the group "All others."

TABLE 9.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919, 1914, AND 1909.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.					
	1919	1914	1909	Amount.			Per cent distribution.		
				1919	1914	1909	1919	1914	1909
Primary power, total.....	543	522	1,214	2,303	2,478	4,129	100.0	100.0	100.0
Owned.....	538	522	1,214	2,257	2,478	4,122	98.0	100.0	99.8
Steam.....	253	325	1,152	1,343	1,669	3,877	58.3	67.4	93.9
Engines.....	243	(1)	(1)	1,296	(1)	(1)	56.3	.....	.....
Turbines.....	10	(1)	(1)	47	(1)	(1)	2.0	.....	.....
Internal-combustion engines.....	269	193	58	884	789	231	38.4	31.8	5.6
Water wheels, turbines, and motors.....	16	4	4	30	20	14	1.3	0.8	0.3
Rented.....	5	.....	.....	46	.....	7	2.0	.....	0.2
Electric.....	5	.....	.....	19	.....	.....	0.8	.....	.....
Other.....	.....	.....	.....	27	.....	7	1.2	.....	0.2
Electric.....	5	1	.....	19	2	.....	100.0	100.0	.....
Rented.....	5	.....	.....	19	.....	.....	100.0	.....	.....
Generated by establishments reporting.....	.....	1	.....	.....	2	.....	.....	100.0	.....

<sup>1</sup> Not reported separately.

SPECIAL STATISTICS.

Crops worked and system employed.—The unit of measure in turpentine-woods operations is the "crop" which consists of about 10,500 boxes or cups. In extracting the resin from the trees, two systems are in use—the box system and the cup and gutter system. The essential feature of the box system is a cavity or "box" cut into the base of the tree to receive the resin which is called "dip." This operation is followed by "chipping," which consists of reexposing the cambium layer by removing directly above the box a strip of bark and sapwood about three-fourths of an inch wide and from one-half to 1 inch deep. The chipping is done with a "hack," a specially constructed tool, from either side diagonally downward terminating in the center and immediately above the box. The exposed surface of the tree the width of the box is termed a "face." A season's chipping extends the face of the tree upward a distance of about 24 inches. The dip is removed from the box by the use of a flat trowel-shaped instrument called a "dipper."

The cup system, now most generally used, differs from the box system principally in the substitution of a clay or metal cup for the cut-in box, the gum being conveyed into the cup by means of metal gutters inserted into the tree and leading diagonally downward. The chipping of the tree begins above the cup, and continues upward in the same manner as when the box system is used. After the chipping has extended up the tree for a distance, usually at the end of the first or second season, the cup and gutters may be raised, thus avoiding much waste by evaporation. Its chief advantage over the box system is that it causes less damage to the vitality and stability of the trees and secures a greater yield and a better quality of crude gum.

The gum which hardens on the face of the tree is called "scrape" and this is gathered at the end of the

season by the use of a "scraper." Because of evaporation, "scrape" produces less spirits and more rosin than dip.

The extent to which the box system is being supplanted by the cup system is strikingly brought out by the figures showing per cent distribution for the three censuses. The box system for gathering crude gum predominated in all of the eight turpentine-producing states in 1909. In 1919 four of the states used the cup system exclusively, and this was the more important method employed in all of the states for gathering crude gum.

TABLE 10.—NUMBER OF CROPS WORKED, AND SYSTEM EMPLOYED, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	NUMBER OF CROPS WORKED.			PER CENT DISTRIBUTION.	
		Total.	By cup system.	By box system.	Cup system.	Box system.
United States.....	1919	12,141	10,503	1,638	86.5	13.5
	1914	18,186	11,813	6,353	65.0	35.0
	1909	20,158	2,383	17,775	11.8	88.2
Alabama.....	1919	1,385	1,353	32	97.7	2.3
	1914	1,693	1,410	283	83.3	16.7
	1909	1,945	309	1,636	15.9	84.1
Florida.....	1919	5,410	4,594	816	84.9	15.1
	1914	8,950	5,627	3,323	62.9	37.1
	1909	9,923	1,114	8,809	11.2	88.8
Georgia.....	1919	3,165	2,396	769	75.7	24.3
	1914	5,044	2,548	2,496	50.5	49.5
	1909	6,178	457	5,721	7.4	92.6
Louisiana.....	1919	893	893	.....	100.0	.....
	1914	943	903	40	95.8	4.2
	1909	633	278	355	43.9	56.1
Mississippi.....	1919	822	822	.....	100.0	.....
	1914	1,138	1,121	17	98.5	1.5
	1909	1,053	182	871	17.3	82.7
North Carolina.....	1919	9	9	.....	100.0	.....
	1914	39	39	.....	100.0	.....
	1909	62	2	60	3.2	96.8
South Carolina.....	1919	50	29	21	58.0	42.0
	1914	125	16	109	12.8	87.2
	1909	271	.....	271	.....	100.0
Texas.....	1919	407	407	.....	100.0	.....
	1914	234	188	46	80.3	19.7
	1909	93	41	52	44.1	55.9

Number and age of crops worked.—Timber which is undergoing its first period of working is called "first boxing" or "round" timber. After it has been worked four or five years it may be allowed to rest for about the same length of time or until the wounds heal and its vitality is restored so that it is in a

condition to furnish another yield of gum. Timber, which after such a rest is again worked, is called "back-boxed" timber, the expression which refers to the cutting of new boxes having originated when the box system was the only one employed.

TABLE 11.—NUMBER OF CROPS, YEARS WORKED, AND SYSTEM EMPLOYED, BY STATES: 1919.

STATE.	Aggregate.	NUMBER OF CROPS.															
		Total.				Virgin (first year).				Yearling (second year).				Pulling (third and subsequent years).			
		First boxing.		Back boxing.		First boxing.		Back boxing.		First boxing.		Back boxing.		First boxing.		Back boxing.	
		Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.
United States.....	12,141	6,086	831	4,417	807	1,673	146	911	126	1,307	150	843	140	3,106	535	2,063	541
Alabama.....	1,385	1,081	29	272	3	163	3	51	.....	253	12	71	1	665	14	150	2
Florida.....	5,410	2,489	637	2,105	170	401	105	392	27	447	105	373	29	1,581	427	1,340	123
Georgia.....	3,165	507	161	1,889	618	152	36	428	00	141	31	305	106	214	84	1,096	413
Louisiana.....	893	893	.....	.....	.....	569	.....	.....	.....	140	.....	.....	.....	175	.....	.....	.....
Mississippi.....	822	753	.....	69	.....	255	.....	20	.....	242	.....	15	.....	256	.....	34	.....
North Carolina.....	9	1	.....	8	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	6	.....
South Carolina.....	50	14	14	7	.....	.....	2	.....	.....	2	.....	4	4	.....	10	8	3
Texas.....	407	348	.....	59	.....	73	.....	15	.....	73	.....	15	.....	202	.....	29	.....

Materials used and products.—Statistics showing the number of establishments, materials used, and products are shown in Table 12 for 1919, 1914, and 1909.

The number of establishments, quantity of materials used, and quantity of products all show decreases for 1919 compared with the figures for the two previous censuses.

TABLE 12.—MATERIALS USED AND PRODUCTS, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	MATERIALS USED (CRUDE GUM DISTILLED).						Total value.	PRODUCTS. <sup>1</sup>				
			Dip (barrels 500 pounds).			Scrape (barrels 300 pounds).				Gallons.	Value.	Barrels (280 pounds).	Value.	Value.
			Total.	Gathered by establishments reporting. <sup>2</sup>	Purchased. <sup>2</sup>	Total.	Gathered by establishments reporting. <sup>2</sup>	Purchased. <sup>2</sup>						
United States.....	1919	1,101	1,432,214	1,411,005	21,209	514,184	505,575	8,600	\$53,051,294	17,693,841	\$20,607,228	2,033,322	\$31,881,000	\$503,066
	1914	1,394	2,104,532	2,134,580	59,952	902,477	873,763	23,714	20,000,191	26,980,981	10,500,527	2,885,077	10,329,410	151,254
	1909	1,585	2,376,003	2,248,724	128,179	1,090,789	1,047,849	51,940	25,298,017	28,688,054	12,054,228	3,263,867	12,576,721	64,068
Alabama.....	1919	174	162,562	158,162	4,400	57,156	55,501	1,055	5,802,492	2,037,005	2,443,040	215,784	3,406,431	42,121
	1914	160	227,695	221,106	6,589	110,620	107,427	3,202	2,047,132	2,721,777	1,083,133	294,820	985,906	8,633
	1909	175	236,270	227,474	8,805	121,286	116,767	4,519	2,471,999	2,840,242	1,253,737	309,763	1,214,064	4,208
Florida.....	1919	452	567,105	562,417	4,688	207,782	207,246	536	21,808,553	0,902,489	8,238,251	868,628	13,088,444	181,858
	1914	508	975,535	970,712	4,823	427,484	425,370	2,114	0,573,083	12,363,232	4,820,679	1,310,307	4,095,561	56,843
	1909	593	1,112,495	1,110,407	1,788	513,924	513,098	820	11,937,518	13,809,785	5,847,478	1,555,749	6,057,524	32,516
Georgia.....	1919	441	348,280	345,312	2,968	95,197	94,636	561	10,874,714	3,997,310	4,544,679	419,090	6,228,507	101,523
	1914	562	512,390	502,932	9,458	178,701	175,472	3,230	4,607,500	0,228,041	2,480,145	621,390	2,038,218	50,227
	1909	592	650,736	647,348	9,388	295,225	291,005	4,220	0,938,957	8,050,752	3,556,965	904,193	3,371,076	10,316
Louisiana.....	1919	33	143,068	143,068	.....	64,790	64,790	.....	5,591,289	1,885,231	2,070,871	201,608	3,404,585	115,833
	1914	27	176,908	175,172	736	74,181	73,871	310	1,858,391	2,252,118	835,509	269,274	1,006,279	10,693
	1909	23	90,224	90,224	.....	43,164	43,164	.....	1,173,848	1,231,254	592,041	139,486	573,306	7,901
Mississippi.....	1919	45	138,495	134,123	4,372	54,384	51,890	2,494	5,547,813	1,740,812	2,011,866	207,114	3,498,136	37,811
	1914	61	207,876	198,289	9,587	73,333	69,951	3,382	1,997,139	2,385,054	905,747	275,505	1,081,040	10,552
	1909	64	127,102	122,626	4,476	62,253	60,060	2,193	1,474,020	1,588,780	732,334	192,508	739,799	2,496
North Carolina.....	1919	14	4,790	730	4,060	3,215	367	2,848	167,410	67,150	76,055	7,290	83,735	7,620
	1914	35	24,964	5,033	19,931	10,037	2,023	8,014	146,681	182,378	70,843	23,641	70,804	6,934
	1909	79	101,188	10,893	90,295	36,237	3,901	32,336	673,954	781,197	369,587	83,070	304,232	135
South Carolina.....	1919	22	4,678	3,957	721	2,054	1,539	515	168,383	58,440	68,212	0,340	99,048	523
	1914	35	20,034	11,170	8,868	7,697	4,294	3,403	151,801	201,221	78,233	16,169	72,377	1,191
	1909	56	37,479	24,052	13,427	21,900	14,054	7,840	406,286	460,186	205,517	51,401	193,273	1,496
Texas.....	1919	10	62,636	62,636	.....	29,606	29,606	.....	3,800,640	900,404	1,213,354	107,462	2,071,514	15,772
	1914	6	50,160	50,160	.....	20,355	20,355	.....	608,374	647,160	256,238	74,355	349,165	2,971
	1909	3	15,700	15,700	.....	5,800	5,800	.....	217,826	220,752	95,960	27,777	116,867	5,000

<sup>1</sup> In addition, in 1919, 1,534,333 gallons of turpentine, valued at \$1,207,730, and 234,030 barrels of rosin, valued at \$2,742,552, were reported by establishments engaged in the distillation of wood. In 1914, 92,491 gallons of turpentine, valued at \$36,017, and 3,927 barrels of rosin, valued at \$44,734, were reported by establishments assigned to lumber and timber products, and 575,557 gallons of turpentine, valued at \$194,183, and 51,825 barrels of rosin, valued at \$103,165, were reported by establishments engaged in the distillation of wood. In 1909, 18,310 gallons of turpentine, valued at \$7,482, were reported by lumber manufacturers, and 700,868 gallons, valued at \$249,526, by wood-distillation establishments.

<sup>2</sup> For 1914 and 1909 the total quantity of dip and scrape purchased was reported but not separately, and the figures for those years are segregated on the basis of the total consumption of each kind.



FOREST PRODUCTS.

TABLE 15.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.								WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Capital.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number 15th day of—			Male.	Female.	Male.		Female.
								Maximum month.	Minimum month.						
United States.....	1,191	31,003	1,460	1,347	214	5	28,007	Jo 28,802	Ja 25,918	29,001	29,103	103	393	2	\$33,595,986
Alabama.....	174	3,379	213	130	15	1	3,014	Au 3,140	Ja 2,784	3,137	3,107	11	18	1	1,992,060
Florida.....	452	13,046	572	635	88	3	11,748	Oc 12,162	Ja 10,582	12,451	12,114	34	302	1	15,525,531
Georgia.....	441	7,971	500	286	17	.....	7,078	Jy 7,250	Ja 6,703	7,445	7,422	11	12	.....	3,653,142
Louisiana.....	33	2,771	4	124	38	1	2,604	De 2,835	Ja 2,234	2,815	2,708	17	.....	.....	6,271,333
Mississippi.....	45	2,656	39	96	26	.....	2,405	Au 2,685	De 2,189	2,008	2,540	30	38	.....	3,471,334
North Carolina.....	14	41	14	1	.....	.....	20	No <sup>1</sup> 30	Ja <sup>1</sup> 20	30	30	.....	.....	.....	49,620
South Carolina.....	22	111	25	2	.....	.....	84	De 92	Ja 71	96	96	.....	.....	.....	109,451
Texas.....	10	1,118	3	67	30	.....	1,018	Ap 1,280	No 773	1,019	906	.....	23	.....	2,483,130

STATE.	EXPENSES.								Value of products.	Value added by manufacture.	POWER.					
	Salaries and wages.			For contract work.	Rent and taxes.		For materials.				Total.	Primary horsepower.				
	Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.				Steam engines.	Steam turbines.	Internal-combustion engines.	Water power. <sup>2</sup>	Rented. <sup>3</sup>
United States.....	\$2,006,441	\$236,415	\$10,972,881	\$425,407	\$34,800	\$819,450	\$13,054,070	\$274,912	\$53,051,204	\$39,121,406	2,303	1,206	47	884	30	46
Alabama.....	213,834	20,125	2,002,190	37,200	450	42,282	1,745,001	38,382	5,892,492	4,108,209	320	183	4	111	28	3
Florida.....	773,283	92,924	6,832,835	199,837	19,654	325,539	5,755,424	103,400	21,508,553	15,649,729	904	570	10	304	.....	20
Georgia.....	341,358	16,880	4,177,639	110,517	13,389	64,459	2,855,868	88,380	10,874,714	7,930,460	783	457	33	288	2	3
Louisiana.....	442,591	51,537	1,627,637	26,175	.....	128,916	1,364,167	16,521	5,591,289	4,210,001	131	10	.....	101	.....	20
Mississippi.....	131,001	31,970	1,574,063	51,003	776	148,968	1,276,579	13,822	5,547,813	4,257,412	78	20	.....	58	.....	.....
North Carolina.....	1,200	.....	15,060	125	.....	776	80,784	3,624	107,410	77,002	4	2	.....	2	.....	.....
South Carolina.....	1,500	.....	47,534	550	.....	1,175	61,725	1,408	108,383	105,250	10	.....	.....	10	.....	.....
Texas.....	101,674	23,070	695,923	.....	.....	107,344	508,528	9,369	3,300,040	2,782,743	64	54	.....	10	.....	.....

<sup>1</sup> Same number reported for one or more other months.

<sup>2</sup> Includes water wheels and turbines (irrespective of ownership of water supply).

<sup>3</sup> Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES  
FOREST PRODUCTS: 1919

LUMBER, LATH, AND SHINGLES

Compiled in cooperation with the  
UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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# LUMBER, LATH, AND SHINGLES.

## INTRODUCTION.

This report presents statistics of the quantity and value of lumber, lath, and shingles produced in the United States during the calendar year 1919, and comparative data for other specified years. The Bureau of the Census, Department of Commerce, and the Forest Service, United States Department of Agriculture, cooperated in compiling these statistics.

Annual statistics for lumber, lath, and shingles have been published by the Bureau of the Census or by the Forest Service for 16 years, from 1904 to 1919, inclusive.<sup>1</sup> During this period the manner of presenting the information has been standardized. In this report statistics are presented, so far as practicable, in the same way as for previous years in order to retain their comparability.

The data for each census year were collected largely by special agents of the Bureau of the Census. For the other years for which statistics are given the returns were secured mostly by correspondence, except for New York. The figures for that state were furnished by the New York Conservation Commission.

These statistics are presented in 42 tables. In Tables 1 to 37, inclusive, are presented statistics pertaining to the production and the reported average value of lumber at the mill. Tables 38 and 39 show the production and the reported average value of lath, and Tables 40 and 41 show similar data for shingles. Table 42 is a detailed summary showing, for 1919, the production of lumber, by kinds of wood and by states, and of lath and shingles, by states.

At the beginning of 1919, the conditions in the lumber industry were unsettled, due largely to the fact that during the greater part of 1918 the products of the sawmills were diverted from the ordinary trade requirements to channels essential for winning the war. Private building operations had been greatly curtailed for this and various other reasons. The lessened demand for lumber by the National Government for emergency war purposes after the signing of the armistice was keenly felt.

The private use of lumber by woodworking industries and by the building trade, however, increased as the year progressed. This increased demand together with a shortage of stock in certain lines caused a sharp advance in prices.

Statistics covering 128 of the principal cities in the United States show a great increase in building

operations for 1919 compared with 1918, when the number of building permits and the cost of improvements were the smallest in 20 years. The increase in the number of building permits issued in these 128 cities was approximately 69 per cent, and the increase in the cost of the improvements was about 205 per cent.<sup>2</sup>

During 1919 the production of lumber and timber products was materially restricted by shortage and high cost of labor, curtailed credits, and inadequate shipping facilities. Unfavorable weather also greatly affected logging operations.

## LUMBER.

**Comparative production (Table 1).**—The production of lumber for each tenth year from 1869 to 1909, inclusive, and for each year since, including 1919, is shown in Table 1 for the principal lumber-producing regions of the United States.

The data are interesting as indicating the period of greatest activity in each region during the past half century. In 1869 the northeastern group of states produced nearly two-fifths of the total quantity of lumber cut in the United States. The Lake states produced more than one-fourth of the total and were developing rapidly.

Ten years later these two regions were still leading, and together produced more than 60 per cent of the total cut for the country. At this time, however, the proportions were practically reversed, the Lake states reporting the greatest production. The last-named region was also the largest producer in 1889 and 1899. The southern group ranked first in 1909 and this region has occupied first position since, producing annually about one-third of the total lumber cut.

The development of the lumber industry in the North Carolina pine group has practically run parallel with the development in the southern group. The peak of the production probably has been passed in both regions.

The growth of the lumber industry in the Pacific states has been rapid. This region contributed 4.4 per cent of the total cut in 1869 and 25.5 per cent in 1919. This is the only region for which a greater production was reported in 1919 than for any previous year.

The production in the Central states has decreased from 17.9 per cent of the total in 1869 to 8.7 per cent in 1919.

The greatest production in the Rocky Mountain states was reported for 1916. However, an increased

<sup>1</sup> Statistics were published by the Bureau of the Census for the years 1904 and 1906 to 1912, inclusive; by the Forest Service for 1905, 1913, and 1915 to 1918, inclusive. Data for the 1914 lumber production were collected by the Bureau of the Census in connection with the quinquennial census of manufactures and published by the Forest Service together with its annual report for 1915. The statistics for 1913 and 1914 did not include data for lath and shingles.

<sup>2</sup> Data from bulletin on "Building Operations in the Larger Cities, 1919," Department of the Interior, U. S. Geological Survey.

output may be looked for from this region, since the peak of the production probably has not been reached in several of the states in this group. In the group designated as "All other states," the lumber industry is of minor importance, primarily on account of the limited timber supply.

The figures shown in Table 1 are fairly comparable, although they were compiled by two different agen-

cies—the Bureau of the Census and the Forest Service. From 1910 to 1918, inclusive, the cut of small mills each manufacturing less than 50,000 feet of lumber per year was omitted from the statistics. In addition, the cut of custom mills was omitted for 1914. The cut of the small mills mentioned above, however, was unimportant and would not affect the comparability of the figures to any appreciable extent.

TABLE 1.—QUANTITY AND PER CENT DISTRIBUTION OF LUMBER CUT IN THE UNITED STATES, BY GROUPS OF STATES, FOR SPECIFIED YEARS: 1869 TO 1919.

YEAR.	Total quantity <sup>1</sup> (M feet b. m.).	GROUP.															
		Northeastern states. <sup>2</sup>		Central states. <sup>3</sup>		Southern states. <sup>4</sup>		North Carolina pine states. <sup>5</sup>		Lake states. <sup>6</sup>		Pacific states. <sup>7</sup>		Rocky Mountain states. <sup>8</sup>		All other states. <sup>9</sup>	
		Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.	Quantity (M feet b. m.).	Per cent of total.
1910.....	34,552,076	2,583,873	7.5	3,015,887	8.7	12,704,483	36.8	3,374,152	9.8	2,601,868	7.8	8,818,321	25.5	1,208,684	3.8	64,808	0.2
1918.....	31,890,494	2,373,000	7.4	2,390,000	7.8	11,135,000	34.9	2,640,000	8.3	3,220,000	10.1	8,590,457	26.9	1,380,303	4.4	52,134	0.2
1917.....	35,831,239	2,488,146	7.0	2,665,000	7.4	13,900,000	38.8	3,265,000	9.1	3,525,000	9.8	8,570,508	23.9	1,370,789	3.8	46,736	0.1
1916.....	39,807,251	3,115,237	7.8	3,315,000	8.3	15,325,000	38.5	4,292,000	10.8	4,050,000	10.2	8,136,000	20.4	1,523,830	3.8	50,184	0.1
1915.....	37,011,656	3,775,000	10.2	3,070,000	8.9	13,590,000	36.7	4,300,000	11.9	3,410,000	9.2	9,770,000	18.3	1,349,004	3.6	57,562	0.2
1914.....	37,346,023	3,553,092	9.5	3,021,339	8.1	13,383,523	35.8	4,417,464	11.8	3,917,666	10.5	7,067,247	18.9	1,330,833	3.6	45,859	0.1
1913.....	38,387,009	3,087,061	8.1	3,930,847	10.2	14,328,810	37.3	3,983,395	10.4	3,866,040	10.1	7,873,900	20.5	1,240,716	3.2	60,240	0.2
1912.....	39,158,414	3,712,557	9.5	4,338,449	11.1	13,537,894	34.6	4,580,235	11.7	4,424,429	11.3	7,218,904	18.4	1,255,752	3.2	90,104	0.2
1911.....	37,003,207	3,034,743	8.2	4,237,791	11.5	12,221,970	33.0	3,783,386	10.1	4,713,755	12.7	7,076,013	19.1	1,290,743	3.5	84,898	0.2
1910.....	40,018,282	3,954,067	9.9	4,674,967	11.7	13,248,979	33.1	4,183,745	10.4	5,030,106	12.6	7,436,951	18.6	1,385,387	3.5	104,380	0.3
1909.....	44,500,761	5,197,012	11.7	5,487,165	12.3	14,795,731	33.3	5,177,091	11.6	5,476,370	12.3	6,905,418	15.5	1,292,550	2.9	179,024	0.4
1890.....	35,077,595	5,709,224	16.3	5,643,379	16.1	8,403,802	24.0	2,712,186	7.7	8,749,842	24.9	3,901,330	8.3	656,367	1.6	401,465	1.1
1880.....	23,842,230	4,725,568	19.8	3,129,988	13.1	3,717,728	15.6	1,128,968	4.7	8,250,702	34.6	2,027,848	8.5	249,431	1.1	611,997	2.6
1870.....	18,091,356	4,642,656	25.8	3,349,232	18.4	1,754,956	9.7	743,533	4.1	6,278,567	34.7	663,667	3.6	163,905	0.9	504,730	2.8
1869.....	12,755,543	4,557,428	35.7	2,284,423	17.9	923,489	7.2	364,261	2.9	3,592,202	28.2	557,778	4.4	58,706	0.5	417,166	3.3

<sup>1</sup> Computed by the Forest Service, Department of Agriculture, for 1915 to 1918, inclusive.

<sup>2</sup> Northeastern group—Connecticut, Delaware, Maryland, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

<sup>3</sup> Central group—Illinois, Indiana, Kentucky, Missouri, Ohio, Tennessee, and West Virginia.

<sup>4</sup> Southern group—Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, Oklahoma, and Texas.

<sup>5</sup> North Carolina pine group—North Carolina, South Carolina, and Virginia.

<sup>6</sup> Lake states group—Michigan, Minnesota, and Wisconsin.

<sup>7</sup> Pacific group—California, Nevada, Oregon, and Washington.

<sup>8</sup> Rocky Mountain group—Arizona, Colorado, Idaho, Montana, New Mexico, Utah, and Wyoming.

<sup>9</sup> All other—Iowa, Kansas, Nebraska, South Dakota, North Dakota, District of Columbia.

Production of lumber, by classes of mills (Table 2).—Statistics have been presented for a number of years for sawmills divided into classes according to the quantity cut. A comparative summary for five classes is presented in Table 2. For 1919 data pertaining to 2,655 mills cutting less than 50,000 feet each per year

were omitted to make the figures comparable with those for previous years. These small mills reported a total cut of 84,567,000 feet, representing only two-tenths of 1 per cent of the total lumber cut of the United States.

TABLE 2.—NUMBER OF MILLS OPERATING AND PRODUCTION OF LUMBER, BY CLASSES OF MILLS: 1914 TO 1919.

CLASS AND YEAR.	MILLS. <sup>1</sup>		QUANTITY CUT. <sup>1</sup>		CLASS AND YEAR.	MILLS. <sup>1</sup>		QUANTITY CUT. <sup>1</sup>	
	Number operating.	Per cent.	M feet b. m.	Per cent.		Number operating.	Per cent.	M feet b. m.	Per cent.
<b>All classes:</b>									
1919.....	26,870	100.0	34,467,509	100.0	Class 3—Mills cutting from 1,000 M to 4,000 M feet:				
1918.....	22,546	100.0	31,890,494	100.0	1919.....	3,211	11.9	5,072,190	17.3
1917.....	21,815	100.0	35,831,239	100.0	1918.....	2,104	9.7	4,270,755	13.4
1916.....	30,081	100.0	39,807,251	100.0	1917.....	2,352	9.5	4,015,941	12.9
1915.....	29,951	100.0	37,011,656	100.0	1916.....	3,041	10.1	5,858,675	14.7
1914.....	27,500	100.0	37,346,023	100.0	1915.....	3,191	10.7	6,201,864	16.8
<b>Class 5—Mills cutting over 10,000 M feet:</b>									
1919.....	792	2.9	18,814,090	54.6	Class 2—Mills cutting from 500 M to 999 M feet:				
1918.....	785	3.5	18,070,552	59.5	1919.....	3,977	14.8	2,062,855	7.7
1917.....	899	3.0	22,148,570	61.8	1918.....	3,183	14.1	2,138,005	6.7
1916.....	925	3.1	23,310,137	58.0	1917.....	3,080	14.9	2,480,685	6.9
1915.....	846	2.8	20,069,740	55.8	1916.....	4,594	15.3	3,096,780	7.8
1914.....	897	3.2	20,934,440	56.1	1915.....	4,198	14.0	2,941,264	7.9
<b>Class 4—Mills cutting from 5,000 M to 9,999 M feet:</b>									
1919.....	503	1.9	3,544,609	10.3	Class 1—Mills cutting from 50 M to 499 M feet:				
1918.....	505	2.2	3,507,104	11.2	1919.....	18,306	68.4	3,478,750	10.1
1917.....	459	1.8	3,360,502	9.4	1918.....	16,879	70.4	2,944,078	9.2
1916.....	484	1.6	3,513,707	8.8	1917.....	17,416	70.2	3,245,541	9.1
1915.....	453	1.5	3,224,448	8.7	1916.....	21,037	69.9	4,027,912	10.1
1914.....	547	2.0	3,910,370	10.5	1915.....	21,293	71.0	3,974,334	10.7
					1914.....	18,540	67.4	3,642,293	9.8

<sup>1</sup> Exclusive of mills cutting less than 50 M feet per year; figures for 1915 to 1918, inclusive, were computed by Forest Service, Department of Agriculture.

The data for 1919 and 1914 are based on reports received by the Bureau of the Census, while those for 1915 to 1918, inclusive, were obtained by the extension of figures based on actual returns so as to show totals for approximately all sawmills, whether or not reports were received from them. These computed figures were compiled by the Forest Service. The data for custom mills were omitted from the statistics for 1914.

It will be noted that considerably over one-half of the total lumber production for 1919 was reported by fewer than 800 mills. The cut of mills producing over 10,000,000 feet per year was less in 1919 than for any previous year shown in the table. The largest increase in any one class is shown for class 3—mills cutting from 1,000,000 feet to 4,999,000 feet. The proportion of the total lumber cut produced by mills of this class

in 1919 was greater than the proportion contributed by the same class of mills in any other year shown in the table. Mills cutting from 50,000 feet to 499,000 feet were by far the most numerous, 68.4 per cent of the total number coming within this class. However, their total output amounted to slightly more than 10 per cent of the total cut, or about the same proportion of the total cut as that of the mills in class 4, the number of mills in this class being only 1.9 per cent of the total number reporting.

Production, by merchant mills (Table 3).—Establishments manufacturing lumber from logs or bolts owned by them and large establishments doing contract sawing are classified as merchant mills. These mills produced 98 per cent of the total cut in 1919.

TABLE 3.—MERCHANT SAWMILLS CLASSIFIED ACCORDING TO REPORTED QUANTITY OF LUMBER CUT, BY STATES: 1919.

STATE.	AGGREGATE.		CLASS 5. MILLS CUTTING OVER 10,000 M FEET.		CLASS 4. MILLS CUTTING FROM 5,000 M TO 9,999 M FEET.		CLASS 3. MILLS CUTTING FROM 1,000 M TO 4,999 M FEET.		CLASS 2. MILLS CUTTING FROM 500 M TO 999 M FEET.		CLASS 1. MILLS CUTTING FROM 50 M TO 499 M FEET.		MILLS CUTTING LESS THAN 50 M FEET.	
	Number of active mills report- ing.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).	Num- ber of mills.	Quantity (M feet b. m.).
United States.....	24,153	33,812,846	792	18,814,099	503	3,544,609	3,208	5,968,135	3,932	2,636,656	13,985	2,824,549	1,733	54,798
Alabama.....	1,610	1,765,314	25	493,012	35	260,925	374	668,104	254	167,252	843	173,498	79	2,523
Arizona.....	20	73,655	4	65,085	2	200,340	2	377,549	233	161,665	14	18,570	96	3,009
Arkansas.....	1,341	1,758,416	39	867,490	29	87,080	32	81,429	16	10,085	70	12,735	6	192
California.....	158	1,289,883	32	1,007,842	12	1	14	237,048	18	12,936	64	13,650	23	665
Colorado.....	130	64,299			1									
Connecticut.....	177	79,960					23	32,006	40	27,344	96	20,035	18	575
Delaware.....	74	25,205			1		1		8	11,361	59	13,672	5	172
Florida.....	414	1,130,310	33	617,690	29	204,765	106	231,488	74	50,677	151	31,064	21	626
Georgia.....	1,436	850,087	9	121,043	19	124,630	172	276,204	244	160,548	897	170,575	95	3,087
Idaho.....	174	764,651	22	660,686	5	37,605	18	39,428	12	9,047	94	17,075	23	810
Illinois.....	154	55,811					10	20,649	26	16,696	103	18,025	15	441
Indiana.....	481	250,751					6	127,482	97	64,220	293	58,454	20	595
Iowa.....	31	11,703			1		2		1	9,125	19	2,406	8	232
Kentucky.....	859	457,910	4	61,201	8	58,759	62	121,210	165	111,088	553	103,574	67	2,078
Louisiana.....	472	3,163,349	97	2,509,125	47	316,382	111	267,703	59	40,557	144	29,146	14	436
Maine.....	588	575,781	6	91,238	11	70,675	135	265,257	116	84,539	282	62,882	38	1,190
Maryland.....	375	99,071			1		12	22,661	37	23,697	277	51,129	48	1,584
Massachusetts.....	245	162,306			1		63	29,834	50	35,901	123	26,284	8	287
Michigan.....	272	860,723	32	513,846	27	190,101	51	117,035	23	15,471	123	23,777	10	493
Minnesota.....	167	666,992	17	540,146	9	64,488	17	32,332	20	13,293	93	16,344	11	389
Mississippi.....	1,370	2,380,303	64	1,315,434	38	286,894	270	480,853	258	171,636	686	143,527	60	1,959
Missouri.....	511	289,286	3	45,021	7	52,894	39	77,030	70	47,381	331	64,911	61	2,049
Montana.....	118	286,885	8	198,957	3	19,784	19	46,930	9	6,992	73	13,532	6	190
New Hampshire.....	318	332,974	4	74,256	1		99	176,859	77	53,724	124	28,653	13	382
New Jersey.....	140	35,640					9	4,300	12	2,970	106	22,970	28	678
New Mexico.....	50	86,808	4	61,424			9	17,176	4	2,909	29	5,147	4	152
New York.....	828	317,257	5	65,157	2		38	84,273	101	65,495	539	97,982	143	4,550
North Carolina.....	2,740	1,582,763	15	221,998	21	157,162	303	487,481	495	324,718	1,840	388,999	75	2,405
Ohio.....	510	241,030	2				47	99,732	106	70,461	327	70,595	28	842
Oklahoma.....	146	167,388	3	107,007	1		14	31,220	18	12,199	95	16,464	15	498
Oregon.....	506	2,677,134	67	2,050,626	28	187,166	115	226,689	81	58,358	197	43,734	18	561
Pennsylvania.....	1,251	593,455	8	179,224	5	44,492	51	76,315	174	115,882	860	172,684	153	4,858
Rhode Island.....	24	10,138					3	3,710	3	2,172	17	4,256	1	
South Carolina.....	613	598,218	10	169,653	20	139,284	90	158,749	110	71,767	301	56,037	82	2,728
South Dakota.....	41	42,970	1				6	33,769	4	2,779	30	6,482		
Tennessee.....	1,420	737,252	8	107,690	15	102,855	105	200,185	192	127,928	964	194,332	136	4,282
Texas.....	435	1,379,332	50	1,011,244	11	82,957	84	183,806	87	61,201	185	39,598	18	526
Utah.....	70	11,782					43	72,372	99	66,646	258	63,569	13	425
Vermont.....	414	203,012			1		136	212,953	338	220,841	1,187	234,445	156	5,027
Virginia.....	1,845	1,050,544	15	273,273	14	104,053	158	351,135	68	48,394	163	37,941	14	415
Washington.....	591	4,961,175	143	4,205,057	45	318,233	52	106,761	92	58,871	381	77,041	61	1,900
West Virginia.....	635	750,595	18	293,052	31	212,940	52	117,790	36	24,642	140	29,527	18	427
Wisconsin.....	305	1,087,738	43	756,489	24	158,863	49		2		43	7,870	7	164
Wyoming.....	52	8,034					1				4	23,348	3	92
All other states <sup>10</sup> .....	9	23,440	1											

1 Includes cut of 2 mills in class 3.  
 2 Includes cut of 1 mill in class 4.  
 3 Includes cut of 1 mill in class 4 and 1 mill in class 3.  
 4 Includes cut of 1 mill in class 4 and 2 mills in class 3.  
 5 Includes cut of 2 mills in class 4.  
 6 Includes cut of 2 mills in class 5.

7 Includes cut of 1 mill in class cutting less than 50 M feet.  
 8 Includes cut of 1 mill in class 5.  
 9 Includes cut of 2 mills in class 2.  
 10 Includes Kansas, Nebraska, and Nevada.  
 11 Includes cut of 1 mill in class 5 and 1 mill in class 3.

Of the 792 mills cutting over 10,000,000 feet each per year, 18.1 per cent were in Washington, 12.2 per cent in Louisiana, 8.5 per cent in Oregon, and 8.1 per cent in Mississippi. These four states reported 46.9 per cent of the total number of large mills. In this connection it will be noted that these are also the main lumber-producing states. Louisiana reported the greatest number of mills in class 4, Alabama in class 3, North Carolina in classes 2 and 1, and Virginia in mills cutting less than 50,000 feet each per year.

**Production, by custom mills (Table 4).**—Small establishments engaged primarily in sawing lumber from logs or bolts furnished by others, receiving therefor a toll either in cash or materials, are classified as custom mills. Table 4 shows, by states, the production of

lumber by custom sawmills, classified according to the reported quantity of lumber cut for 1919. The 5,381 mills classified as custom produced only 709,230,000 feet of lumber, an average of 131,803 feet each, their combined production being only 2 per cent of the total for all mills in the United States.

The greatest number of custom mills was reported from North Carolina, and this was the only state which reported such mills sawing over 1,000,000 feet each. Tennessee, New York, and Virginia also reported large numbers of custom mills. These four states reported 31.7 per cent of the total number of custom mills.

Most of the custom mills are small, 82 per cent of the total number reported cutting from 50,000 feet to 499,000 feet each.

TABLE 4.—CUSTOM SAWMILLS CLASSIFIED ACCORDING TO REPORTED QUANTITY OF LUMBER CUT, BY STATES: 1919.

STATE.	AGGREGATE.		CLASS 2—MILLS CUTTING FROM 500 M TO 999 M FEET.		CLASS 1—MILLS CUTTING FROM 50 M TO 499 M FEET.		MILLS CUTTING LESS THAN 50 M FEET.	
	Number of active mills reporting.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).	Number of mills.	Quantity (M feet b. m.).
United States.....	5,381	709,230	148	30,260	4,411	649,201	922	29,769
Alabama.....	316	33,432	.....	.....	241	30,973	75	2,459
Arkansas.....	109	13,741	1	.....	91	13,204	14	477
Colorado.....	3	505	.....	.....	3	505	.....	.....
Connecticut.....	53	6,748	.....	.....	30	6,272	14	476
Delaware.....	6	2,232	2	.....	4	2,232	.....	.....
Florida.....	11	1,122	.....	.....	7	1,012	4	110
Georgia.....	336	37,878	1	.....	271	35,722	64	2,156
Idaho.....	7	737	.....	.....	6	737	1	.....
Illinois.....	98	8,817	1	.....	58	7,544	30	1,273
Indiana.....	228	31,730	4	2,195	188	28,306	34	1,145
Iowa.....	54	6,730	.....	.....	42	6,340	12	390
Kentucky.....	363	54,168	5	2,610	317	50,195	41	1,963
Louisiana.....	4	522	.....	.....	3	4,522	.....	.....
Maine.....	93	20,335	10	6,205	75	13,891	8	239
Maryland.....	131	14,291	.....	.....	100	13,010	22	672
Massachusetts.....	27	4,535	.....	.....	23	4,535	1	.....
Michigan.....	101	15,168	1	.....	88	14,712	12	456
Minnesota.....	188	32,647	9	5,240	165	26,901	14	445
Mississippi.....	72	9,832	.....	.....	61	9,449	11	383
Missouri.....	285	32,697	.....	.....	216	29,888	69	2,209
Montana.....	7	993	.....	.....	7	993	.....	.....
New Hampshire.....	34	5,803	.....	.....	31	5,073	3	130
New Jersey.....	13	1,342	.....	.....	8	1,174	5	168
New York.....	408	40,507	1	.....	280	36,681	127	3,826
North Carolina.....	465	71,672	18	10,685	413	63,498	44	1,489
Ohio.....	263	38,446	.....	.....	235	37,540	28	900
Oklahoma.....	7	1,015	.....	.....	5	1,015	2	.....
Pennsylvania.....	278	37,010	.....	.....	237	35,881	41	1,135
Rhode Island.....	6	892	.....	.....	4	892	2	.....
South Carolina.....	106	23,401	.....	.....	176	22,737	20	724
Tennessee.....	430	54,880	.....	.....	359	52,315	77	2,565
Texas.....	9	442	.....	.....	8	280	6	162
Utah.....	3	135	.....	.....	2	135	1	.....
Vermont.....	83	15,467	5	3,000	69	12,176	0	291
Virginia.....	399	47,494	.....	.....	321	44,980	78	2,505
West Virginia.....	101	12,538	.....	.....	82	11,050	19	588
Wisconsin.....	184	28,600	.....	.....	164	27,953	20	647
All other states <sup>a</sup> .....	9	1,194	.....	.....	5	1,050	4	135

<sup>1</sup> Includes 3 mills cutting from 1,000 M to 4,999 M feet, their total cut being 4,061 M feet.

<sup>2</sup> Includes the cut of 1 mill in class 2.

<sup>3</sup> Includes the cut of 2 mills in class 2.

<sup>4</sup> Includes the cut of 1 mill in class cutting less than 50 M feet.

<sup>5</sup> Includes the cut of 2 mills in class cutting less than 50 M feet.

<sup>6</sup> Includes Kansas, Nebraska, Oregon, Washington, and Wyoming.

# LUMBER, LATH, AND SHINGLES.

Production of lumber, by states (Table 5).—The cut of lumber for 1919, 1914, and 1909 is shown in Table 5, by states arranged according to their rank in production for 1919. Only seven states reported a larger cut in 1919 than in 1909. With the exception of Alabama and South Dakota all of these states are located in the west coast and Rocky Mountain regions. The decrease in the annual lumber cut is indicated by the fact that only 12 states reported a cut of over 1,000,000,000 feet in 1919, as against 16 states in 1914 and 19 in 1909. The tendency toward large mills is also brought out in this table. The aver-

age cut of all mills reporting in 1919 was 1,169,908 feet, compared with 955,473 feet in 1909. In comparing the average cut per mill for 1914 with the averages for the other two years, the fact that figures for certain small mills were excluded in 1914 should be taken into consideration. All states except Arizona, reporting an increased cut in 1919 as compared with that for 1909, reported a smaller number of mills in 1919. The greatest average cut per mill in 1919 for any one state was 8,380,439 feet in Washington. California was next with 7,970,652 feet and Louisiana third with 6,646,788 feet.

TABLE 5.—PRODUCTION OF LUMBER, BY STATES: 1919, 1914, AND 1909.

STATE.	RANK IN PRODUCTION.			NUMBER OF ACTIVE MILLS REPORTING. <sup>1</sup>		LUMBER SAWED.							
	1919	1914	1909	1919	1909	Quantity (M feet b. m.).			Per cent of increase. <sup>2</sup>		Per cent distribution.		
						1919	1914	1909	1914-1919	1909-1914	1919	1914	1909
United States.....				20,534	46,584	34,552,076	37,346,023	44,509,761	-7.5	-16.1	100.0	100.0	100.0
Washington.....	1	2	1	592	714	4,961,220	3,946,189	3,862,916	25.7	2.2	14.4	10.6	8.7
Louisiana.....	2	1	2	470	641	3,163,871	3,066,434	3,551,918	-20.0	11.4	9.2	10.6	8.0
Oregon.....	3	5	9	507	645	2,577,403	1,817,875	1,898,995	41.8	-4.3	7.5	4.9	4.2
Mississippi.....	4	3	3	1,448	1,761	2,390,135	2,280,966	2,572,669	4.8	-11.3	6.9	6.1	5.8
Alabama.....	5	8	11	1,926	2,125	1,798,746	1,494,732	1,691,001	20.3	-11.6	5.2	4.0	3.8
Arkansas.....	6	0	5	1,447	1,958	1,772,157	1,796,780	2,111,300	-1.4	-14.9	5.1	4.8	4.7
North Carolina.....	7	4	4	3,214	3,249	1,654,435	2,227,854	2,177,715	-25.7	2.3	4.8	6.0	4.9
Texas.....	8	7	7	444	663	1,379,774	1,554,005	2,099,130	-11.2	-26.0	4.0	4.2	4.7
California.....	9	12	18	158	273	1,259,363	1,303,183	1,143,507	-3.4	14.0	3.6	3.5	2.6
Florida.....	10	15	17	425	471	1,137,432	1,073,821	1,201,734	-6.9	-10.6	3.3	2.9	2.7
Wisconsin.....	11	10	8	489	1,205	1,116,338	1,391,001	2,025,038	-19.7	-31.3	3.2	3.7	4.5
Virginia.....	12	9	6	2,244	3,485	1,098,038	1,458,070	2,101,716	-26.2	-29.2	3.2	4.0	4.7
Georgia.....	13	16	16	1,772	1,991	893,905	1,026,191	1,342,249	-12.9	-23.5	2.6	2.7	3.0
Michigan.....	14	13	10	373	1,263	875,891	1,214,435	1,889,724	-27.9	-35.7	2.5	3.2	4.2
Tennessee.....	15	18	10	1,890	2,631	792,132	885,035	1,223,848	-10.5	-27.7	2.3	2.4	2.7
Idaho.....	16	20	25	181	290	765,388	763,508	645,800	0.2	18.2	2.2	2.0	1.5
West Virginia.....	17	14	13	796	1,524	763,103	1,118,480	1,472,942	-31.8	-24.1	2.2	3.0	3.3
Minnesota.....	18	11	12	365	720	699,639	1,312,230	1,561,568	-46.7	-16.0	2.0	3.5	3.5
Pennsylvania.....	19	19	14	1,529	2,974	680,471	864,710	1,462,771	-27.1	-40.9	1.8	2.3	3.3
South Carolina.....	20	21	20	809	998	621,679	701,540	897,680	-11.4	-21.8	1.8	1.9	2.0
Maine.....	21	17	19	681	1,181	596,116	992,594	1,111,565	-39.9	-10.7	1.7	2.7	2.5
Kentucky.....	22	22	21	1,222	2,361	512,078	596,392	860,712	-14.1	-30.7	1.5	1.6	1.9
New York.....	23	23	22	1,236	2,286	357,764	486,195	681,440	-26.4	-28.7	1.0	1.3	1.5
New Hampshire.....	24	24	24	352	682	338,777	428,744	649,606	-29.8	-25.7	1.0	1.3	1.5
Missouri.....	25	25	23	796	2,045	321,393	370,571	680,159	-13.3	-43.9	0.9	1.0	1.5
Montana.....	26	26	30	125	179	287,378	317,842	308,582	-9.6	3.0	0.8	0.9	0.7
Indiana.....	27	27	26	707	1,599	282,487	298,571	556,418	-5.4	-46.3	0.8	0.8	1.3
Ohio.....	28	28	27	773	1,628	280,076	286,063	542,904	-2.1	-47.3	0.8	0.8	1.2
Vermont.....	29	29	29	497	711	218,479	249,608	351,571	-12.5	-29.0	0.6	0.7	0.8
Oklahoma.....	30	30	32	168	370	168,403	200,594	225,730	-16.0	-11.1	0.5	0.5	0.5
Massachusetts.....	31	32	28	272	628	166,841	143,094	361,200	16.6	-60.4	0.5	0.4	0.8
Maryland.....	32	31	31	506	721	113,362	162,097	267,939	-30.1	-39.5	0.3	0.4	0.6
New Mexico.....	33	37	87	60	80	86,808	57,167	91,987	51.8	-37.9	0.3	0.1	0.2
Connecticut.....	34	34	34	230	422	86,708	81,883	168,371	5.9	-51.4	0.3	0.2	0.4
Arizona.....	35	35	38	20	10	73,855	78,667	62,731	-6.4	25.4	0.2	0.2	0.1
Colorado.....	36	33	35	133	250	64,884	102,117	141,710	-36.5	-27.9	0.2	0.3	0.3
Illinois.....	37	36	33	252	827	64,628	66,227	170,181	-2.4	-61.1	0.2	0.2	0.4
South Dakota.....	38	40	41	41	54	42,970	18,744	31,057	129.2	-39.6	0.1	0.1	0.1
New Jersey.....	39	38	39	162	269	36,888	48,748	61,620	-24.3	-20.9	0.1	0.1	0.1
Delaware.....	40	39	40	80	151	27,437	25,517	55,440	7.5	-54.0	0.1	0.1	0.1
Nevada.....	41	( <sup>4</sup> )	( <sup>4</sup> )	3	( <sup>4</sup> )	20,335	( <sup>4</sup> )	( <sup>4</sup> )	61.6	-91.3	0.1	( <sup>5</sup> )	0.3
Iowa.....	42	43	36	85	350	18,493	11,443	132,021					
Utah.....	43	44	44	82	88	11,917	8,680	12,638	37.3	-31.3	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )
Rhode Island.....	44	41	43	30	37	11,030	15,902	25,489	-30.6	-37.6	( <sup>5</sup> )	( <sup>5</sup> )	0.1
Wyoming.....	45	42	42	54	88	8,674	11,852	28,602	-26.8	-58.6	( <sup>5</sup> )	( <sup>5</sup> )	0.1
All other states.....				11	11	3,345	15,672	15,946	-78.7	-1.7	( <sup>5</sup> )	( <sup>5</sup> )	( <sup>5</sup> )

<sup>1</sup> The total number of active mills reporting in 1914 was 27,506, not published by states.

<sup>2</sup> A minus sign (-) denotes decrease.

<sup>3</sup> Custom mills and mills cutting less than 50 M feet not included in 1914.

<sup>4</sup> Not published separately.

<sup>5</sup> Less than one-tenth of 1 per cent.

<sup>6</sup> Includes Kansas and Nebraska for 1919, and Kansas, Nebraska, and Nevada for 1914 and 1909.

## FOREST PRODUCTS.

Production of lumber, by species (Tables 6 to 36).—The cut of lumber, by kinds of wood, is shown in Table 6 for 1919, 1914, and 1909, the species being arranged in order of their rank in production for 1919.

Five species of wood have occupied the same relative position for the three years shown—yellow pine, Douglas fir, oak, hemlock, and lodgepole pine. Western yellow pine advanced from seventh place in 1909 to fourth place in 1919, and white pine dropped from

fourth place in 1909 to sixth place in 1919. These are the two most notable changes in rank. Only six species—Douglas fir, western yellow pine, red gum, white fir, tupelo, and sugar pine—were cut in larger quantities in 1919 than in 1909. Three of these woods—Douglas fir, western yellow pine, and red gum—showed smaller cuts in 1914 than in 1909, and only two woods—white fir and tupelo—showed uninterrupted increases.

TABLE 6.—PRODUCTION OF LUMBER, BY KINDS OF WOOD: 1919, 1914, AND 1909.

KIND OF WOOD.	RANK IN PRODUCTION.			LUMBER SAWED.								
				Quantity (M feet b. m.).			Per cent of increase. <sup>1</sup>		Per cent distribution.			
	1919	1914	1909	1919	1914 <sup>2</sup>	1909	1914-1919	1909-1914	1919	1914	1909	
Total.....				34,552,076	37,346,023	44,509,761	-7.5	-16.1	100.0	100.0	100.0	
Yellow pine.....	1	1	1	13,002,038	14,472,804	16,277,185	-0.7	-11.1	37.8	38.8	36.6	
Douglas fir.....	2	2	2	5,002,169	4,703,003	4,850,378	23.9	-1.0	17.1	12.8	10.9	
Oak.....	3	3	3	2,708,280	3,278,008	4,414,457	-17.4	-25.7	7.8	8.8	9.9	
Western yellow pine.....	4	6	7	1,755,015	1,327,305	1,490,985	32.2	-11.5	5.1	3.6	3.4	
Hemlock.....	5	5	5	1,754,908	2,105,728	3,051,399	-10.0	-20.0	5.1	5.8	6.9	
White pine.....	6	4	4	1,723,642	2,032,587	3,900,034	-34.5	-32.5	5.0	7.0	8.8	
Spruce.....	7	7	6	970,908	1,245,614	1,748,547	-21.3	-28.8	2.8	3.3	3.9	
Maple.....	8	9	8	837,480	909,743	1,100,004	-5.7	-17.8	2.5	2.4	2.5	
Red gum.....	9	10	11	851,431	675,380	706,945	26.1	-4.5	2.5	1.8	1.6	
Cypress.....	10	8	9	656,212	1,013,013	955,635	-35.2	6.0	1.9	2.7	2.1	
Chestnut.....	11	11	12	545,606	540,591	603,891	0.9	-18.6	1.6	1.4	1.5	
Redwood.....	12	12	13	410,442	535,199	521,630	-23.3	2.0	1.2	1.4	1.2	
Larch.....	13	17	16	388,121	358,561	421,214	8.2	-14.9	1.1	1.0	0.9	
Birch.....	14	15	15	375,079	430,667	462,370	-12.9	-4.8	1.1	1.2	1.0	
Beech.....	15	10	14	358,985	376,464	511,244	-4.6	-26.4	1.0	1.0	1.1	
Cedar.....	16	14	19	332,234	409,903	340,008	-33.5	44.5	1.0	1.3	0.8	
Yellow poplar.....	17	13	10	328,538	510,221	858,500	-36.7	-39.5	0.9	1.4	1.9	
White fir.....	18	26	26	223,422	112,027	39,318	98.4	20.1	0.6	0.3	0.2	
Elm.....	19	19	18	194,417	214,294	347,450	-9.3	-38.3	0.6	0.6	0.8	
Basswood.....	20	18	17	183,562	204,656	309,151	-30.6	-33.7	0.5	0.7	0.9	
Hickory.....	21	25	20	170,013	116,113	333,929	46.4	-65.2	0.5	0.3	0.8	
Ash.....	22	21	21	154,931	189,499	291,209	-18.2	-34.9	0.4	0.5	0.7	
Cottonwood.....	23	20	22	144,155	195,198	265,606	-26.1	-26.5	0.4	0.5	0.6	
Tupelo.....	24	24	25	143,730	124,480	96,673	15.5	28.8	0.4	0.3	0.2	
Sugar pine.....	25	22	24	133,658	136,159	97,191	-1.8	40.1	0.4	0.4	0.2	
Balsam fir.....	26	23	23	68,030	125,212	108,702	-45.7	15.2	0.2	0.3	0.2	
Walnut.....	27	27	28	30,218	25,573	46,108	53.4	-44.5	0.1	0.1	0.1	
Sycamore.....	28	28	27	28,114	22,773	56,511	23.5	-59.7	0.1	0.1	0.1	
Lodgepole pine.....	29	29	29	16,281	18,374	23,733	-11.4	-22.6	0.1	0.1	0.1	
All other.....				61,308	55,924	62,151	10.2	-10.5	0.2	0.1	0.1	

<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Custom mills and mills cutting less than 50,000 feet per year not included in 1914.

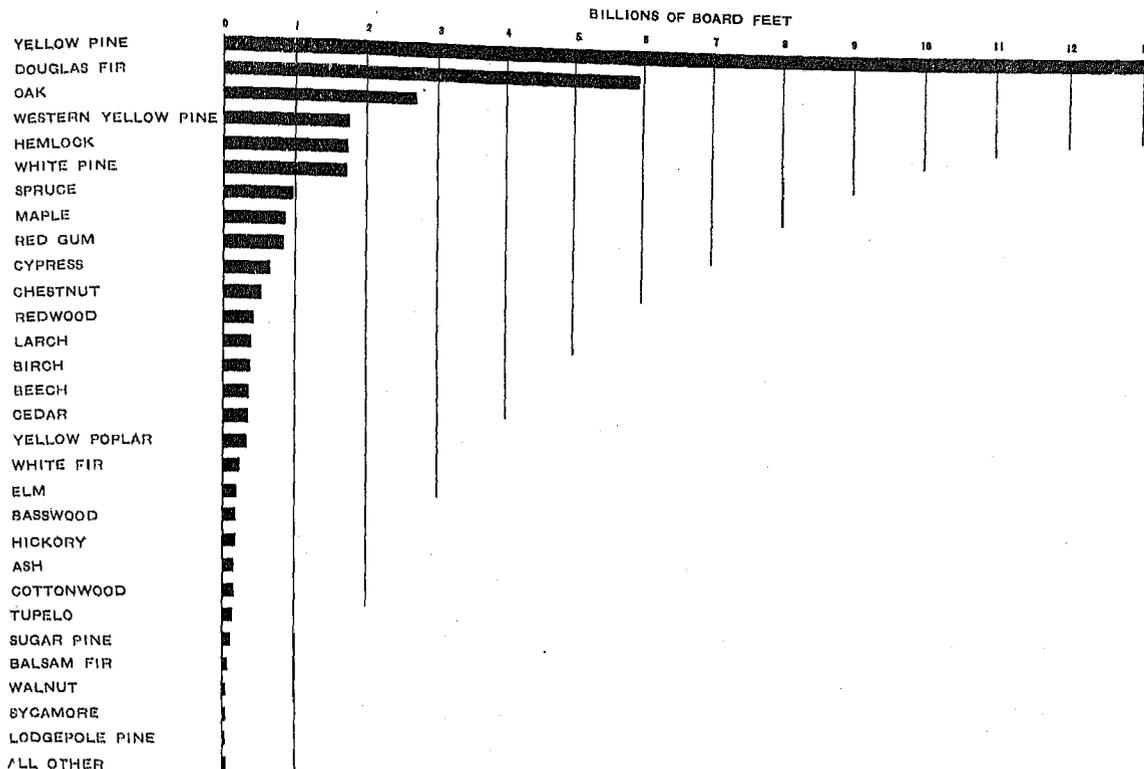
In 1919 six species contributed more than 1,000,000,000 feet each of the total lumber cut for that year. The importance of yellow pine is clearly

brought out, this wood alone contributing considerably more than one-third of the total. The lumber cut, by kinds of wood, is shown in the following diagram.

# LUMBER, LATH, AND SHINGLES.

## PRODUCTION OF LUMBER, BY KINDS OF WOOD: 1919.

9



### YELLOW PINE.

In Table 7 are presented data pertaining to the lumber cut from the several species of yellow pine growing in the Eastern and Southern states. The three kinds contributing chiefly to the total cut were longleaf, shortleaf, and loblolly pines. The annual output of yellow pine lumber has been greater than that from any other one kind of timber since 1899. Records showing the cut, by kinds of wood, for earlier years are not available. The largest cut, 16,277,185,000 feet, board measure, was reported for the year 1909. Compared with the cut for that year, the production for 1919 decreased 19.7 per cent.

The relative production of yellow pine lumber by the principal producing states has not changed materially during the past few years. In 1918 Mississippi occupied second place, Texas third, and Alabama fourth. In 1919 the order was reversed for Alabama and Texas. In 1899 Georgia was the principal yellow pine lumber-producing state, reporting a total cut of 1,251,266,000 feet, or 11.8 per cent of the total quantity of yellow pine lumber produced in the United States during that year. Statistics for 1904 show Louisiana in the lead, and this state has occupied first place since that time.

The average cut of yellow pine lumber per mill in the United States was 967,052 feet in 1919. The average cut in Louisiana was 6,731,354 feet, the

largest reported by any state. Texas also reported a large average cut, 3,191,209 feet.

The average value at the mill per thousand feet of this lumber has more than doubled in the past four years. The reported average values were \$14.33 in 1916, \$19.00 in 1917, \$24.38 in 1918, and \$28.71 in 1919.

TABLE 7.—PRODUCTION OF YELLOW PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity. (M feet b. m.).	Per cent distribution.	Average value per M feet. (f.o.b. mill).
United States.....	13,508	13,062,938	100.0	\$28.71
Louisiana.....	367	2,470,407	18.9	31.49
Mississippi.....	1,269	1,980,395	15.2	29.39
Alabama.....	1,831	1,642,588	12.6	24.37
Texas.....	417	1,330,784	10.2	30.88
North Carolina.....	2,877	1,240,142	9.5	27.56
Arkansas.....	805	1,049,340	8.0	29.61
Florida.....	413	1,004,766	7.7	29.80
Georgia.....	1,753	767,217	5.9	24.54
Virginia.....	1,665	646,834	5.0	28.32
South Carolina.....	808	544,475	4.2	30.22
Oklahoma.....	81	144,412	1.1	28.64
Tennessee.....	550	95,979	0.7	25.43
All other states (see Table 42).....	772	145,640	1.1	27.76

<sup>1</sup> LONGLEAF PINE (*Pinus palustris*); also known as Georgia pine and hard pine and exported as pitch pine; cut mostly in the Gulf states.

NORTH CAROLINA PINE (*Pinus taeda*); also called shortleaf, loblolly, old field, rosemary, and Virginia pine; cut mostly in Virginia, North Carolina, South Carolina, Arkansas, and Texas.

SHORTLEAF PINE (*Pinus echinata*); cut mostly in Virginia, North Carolina, South Carolina, Arkansas, Missouri, Louisiana, and Mississippi.

SAND PINE (*Pinus clausa*); Florida and Alabama.

SAND (OR CUBAN) PINE (*Pinus caribaea*); cut mostly in Georgia and the Gulf states east of the Mississippi River.

SCRUB PINE (*Pinus virginiana*), also called JERSEY PINE; cut in the Middle Atlantic states.

PITCH PINE (*Pinus rigida*); Middle Atlantic and Northern states.

SPRUCE PINE (*Pinus glabra*); Georgia and Gulf states.

POND PINE (*Pinus serotina*); South Atlantic states.

TABLE-MOUNTAIN PINE (*Pinus pungens*); Appalachian Mountains.

## DOUGLAS FIR.

The stand of Douglas fir timber in the United States is greater than that of any other single kind of wood. This timber is common in the Rocky Mountains and westward to the Pacific coast. Its growing importance in the lumber industry is manifested in these statistics. The lumber cut from this wood in 1919 was the largest for any year for which figures are available and exceeded the output for 1918, the next largest, by 83,028,000 feet, or 1.4 per cent. The relative rank of the principal producing states has remained practically the same for several years, Washington being by far the greatest contributor to the total cut for each year since 1899.

The average cut of Douglas fir lumber per mill in the United States for 1919 was 4,930,801 feet, and the average cut per mill in Washington was 7,863,349 feet. Of the 1,197 mills cutting Douglas fir, 225 cut more than 10,000,000 feet each, 75 cut from 5,000,000 to 10,000,000 feet each, 265 cut from 1,000,000 to 5,000,000 feet each, and 632 mills cut less than 500,000 feet each.

The average value at the mill per thousand feet of Douglas fir lumber for 1916 was \$10.78; for 1917, \$16.28; for 1918, \$18.77; and for 1919, \$24.62.

TABLE 8.—PRODUCTION OF DOUGLAS FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1,197	5,902,100	100.0	\$24.62
Washington.....	493	3,870,631	65.7	24.89
Oregon.....	393	1,705,492	30.4	24.11
California.....	61	141,327	2.4	25.01
Montana.....	77	40,675	0.7	22.00
Idaho.....	103	32,580	0.6	20.97
All other states (see Table 42).....	70	15,404	0.3	24.00

<sup>1</sup> DOUGLAS FIR (*Pseudotsuga taxifolia*) is the principal commercial species.

## OAK.

Under the general head of "Oak" are included all of the many different species of this wood cut into lumber in the United States. Commercially the different varieties are classified as white oak or red oak. The oaks are among the most widely distributed forest trees in the United States and in 1919, 35 states reported lumber cut from these species.

The largest annual cut reported during the past two decades was 4,438,027,000 feet for 1899. This quantity was almost equaled for 1909 when the output was reported as 4,414,457,000 feet.

In 1899 Indiana and Ohio ranked first and second, respectively, in the production of oak lumber. Since that time the principal producing states have been Kentucky, Tennessee, West Virginia, and Arkansas,

each one of which has produced the largest annual cut for one or more of the intervening years. In 1919 these four states contributed nearly 45 per cent of the total cut in the United States.

The average value at the mill per thousand feet of oak lumber for 1916 was \$20.06; for 1917, \$24.49; for 1918, \$31.11; and for 1919, \$37.87.

TABLE 9.—PRODUCTION OF OAK<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	13,964	2,708,280	100.0	\$37.87
Tennessee.....	1,074	349,725	12.9	37.23
Arkansas.....	845	300,523	11.1	39.01
Kentucky.....	1,148	282,963	10.4	36.23
West Virginia.....	684	279,891	10.3	40.02
Virginia.....	1,330	240,707	8.9	31.27
Missouri.....	717	150,031	5.5	30.27
Pennsylvania.....	1,236	145,421	5.4	36.90
North Carolina.....	1,068	136,120	5.0	32.89
Ohio.....	695	133,107	4.9	48.74
Mississippi.....	203	132,804	4.9	43.11
Indiana.....	615	109,583	4.0	54.40
Louisiana.....	127	85,105	3.1	37.24
Alabama.....	472	61,189	2.3	31.85
Illinois.....	243	34,801	1.3	39.73
Georgia.....	305	34,537	1.3	32.40
Maryland.....	365	31,427	1.2	35.91
Texas.....	81	28,005	1.1	30.76
Wisconsin.....	290	25,578	0.9	45.72
New York.....	549	24,051	0.9	42.71
Oklahoma.....	74	19,750	0.7	26.65
Connecticut.....	180	18,727	0.7	35.54
All other states (see Table 42).....	1,027	83,506	3.1	38.96

<sup>1</sup> Commercially the oaks are classed as white and red. The principal commercial oaks are listed below:

WHITE OAKS.—WHITE OAK (*Quercus alba*) is the white oak common throughout the eastern half of the United States; CHESTNUT (or ROCK) OAK (*Quercus prinus*) is found in the Appalachian region; POST OAK (*Quercus minor*) and BUR OAK (*Quercus macrocarpa*) are common throughout the eastern half of the country; OVERCUP OAK (*Quercus lyrata*) and COW (or BASKET) OAK (*Quercus michauxii*) are the principal southern white oaks.

RED OAKS.—RED OAK (*Quercus rubra*) is the red oak common in the eastern part of the United States; TEXAN OAK (*Quercus texana*) is the principal red oak sawed in the lower Mississippi Valley; PIN OAK (*Quercus palustris*) is found in the Eastern and Central states; SCABLER OAK (*Quercus coccinea*) is the northern and northeastern red oak; YELLOW (or BLACK) OAK (*Quercus velutina*) is common in most states east of the Rocky Mountains; WILLOW OAK (*Quercus phellos*) is cut mostly in the Southern states.

## WESTERN YELLOW PINE.

The stand of western yellow pine (*Pinus ponderosa*) is perhaps the third largest in the United States. The importance of this species for lumber has increased considerably since 1899, and the cut reported for 1919 is the second largest annual cut for which records are available, the total production for 1917 being reported as 1,865,282,000 feet, or 110,267,000 feet more than for 1919.

For 1918 and 1919 Oregon reported the largest production. California was the leading state for all previous years for which records are available.

The average cut of western yellow pine lumber per mill in the United States for 1919 was 2,064,724 feet. The average cut per mill in Oregon was 3,559,363 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$14.52; for 1917, \$19.59; for 1918, \$20.87; and for 1919, \$27.75.

TABLE 10.—PRODUCTION OF WESTERN YELLOW PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	850	1,755,015	100.0	\$27.75
Oregon.....	135	480,514	27.4	27.11
California.....	115	444,150	25.3	30.98
Idaho.....	110	255,320	14.5	27.53
Washington.....	139	217,838	12.4	25.79
Montana.....	87	108,548	6.2	22.92
New Mexico.....	49	75,430	4.3	20.83
Arizona.....	20	73,622	4.2	28.40
South Dakota.....	41	42,970	2.4	33.37
Colorado.....	85	32,773	1.9	25.67
All other states (see Table 42).....	69	23,840	1.4	27.63

<sup>1</sup> WESTERN YELLOW PINE (*Pinus ponderosa*) is the one species cut as such.

## HEMLOCK.

Four species contribute to the output of hemlock lumber. The most important of these are the common hemlock, which grows in the Northern states from Maine to Wisconsin and southward to the Appalachian region, and western hemlock, reported chiefly by Washington and Oregon.

In 1919, 25 states contributed to the total output of lumber from this wood. For many years Pennsylvania was the leading state in the production of hemlock lumber, reporting a cut of 1,558,188,000 feet in 1899; but in 1908 it was superseded by Wisconsin, which has occupied first place since that time.

The annual cut of hemlock lumber has greatly decreased for the past two decades, because of the depletion of the timber supply in certain sections of the country. The total cut in the United States for 1899 was 3,420,673,000 feet, and the 1919 cut shows a decrease of 1,665,675,000 feet, or 48.7 per cent.

The average value at the mill per thousand feet of hemlock lumber for 1916 was \$15.35; for 1917, \$20.78; for 1918, \$23.97; and for 1919, \$29.16.

TABLE 11.—PRODUCTION OF HEMLOCK<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,653	1,754,998	100.0	\$29.16
Wisconsin.....	260	439,757	25.1	28.78
Washington.....	110	296,854	16.3	22.79
Michigan.....	223	207,824	15.3	30.61
Pennsylvania.....	577	225,155	12.8	34.40
West Virginia.....	121	104,582	6.0	32.62
Maine.....	397	85,542	4.9	29.22
New York.....	891	79,062	4.5	34.48
Oregon.....	33	62,906	3.0	23.16
North Carolina.....	124	48,462	2.8	27.65
Tennessee.....	46	40,221	2.3	30.10
Vermont.....	331	31,554	1.8	30.37
New Hampshire.....	193	31,404	1.8	28.96
Virginia.....	92	28,744	1.6	27.42
Massachusetts.....	115	12,825	0.7	27.65
Kentucky.....	41	10,090	0.6	31.97
All other states (see Table 42).....	93	10,016	0.6	28.70

<sup>1</sup> HEMLOCK (*Tsuga canadensis*) is cut in the Lake states, Northeastern states, and the Appalachian region.

WESTERN HEMLOCK (*Tsuga heterophylla*) is found in Washington and Oregon.

BLACK (OR WESTERN MOUNTAIN) HEMLOCK (*Tsuga mertensiana*) is cut in small quantities.

CAROLINA HEMLOCK (*Tsuga caroliniana*) is occasionally cut in the Appalachian region.

## WHITE PINE.

Under this heading are included four distinct species—white pine cut in the Lake states, Appalachian region, and Northeastern states; Norway pine and jack pine cut in the Lake states; and western white pine cut in Idaho, Montana, Washington, and Oregon. These species are well distributed and all the Northern states are represented in the total cut.

The production of white pine lumber has been decreasing for the past two or more decades. The reported cut in 1899 was 7,483,283,000 feet. Of this amount, 5,726,332,000 feet were cut in Michigan, Wisconsin, and Minnesota, the leading three states for that year. The total cut of white pine for 1919 was only 23 per cent as great as the total reported for 1899.

The maximum production of white pine in the Lake states was probably reached in 1890 when the estimated cut was 8,597,623,000 feet. Minnesota was still the leading state in the production of this species in 1919, but Wisconsin and Michigan had dropped to fifth place and eighth place, respectively. The output of white pine in the New England states has remained at about the same level for the past 20 years, the greater part of the cut in these states being second- or third-growth timber.

The average cut per mill of this lumber in the leading three states in 1919 was 2,224,381 feet in Minnesota, 4,983,128 feet in Idaho, and 432,965 feet in Maine. The average cut per mill for the United States was 480,659 feet. The average value at the mill per thousand feet of white pine lumber for 1916 was \$19.16; for 1917, \$24.81; for 1918, \$30.84; and for 1919, \$32.83.

TABLE 12.—PRODUCTION OF WHITE PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,586	1,723,642	100.0	\$32.83
Minnesota.....	252	560,544	32.5	31.23
Idaho.....	47	234,207	13.6	35.99
Maine.....	517	223,843	13.0	31.50
New Hampshire.....	307	176,012	10.2	29.02
Wisconsin.....	264	125,959	7.3	29.02
Massachusetts.....	223	104,200	6.0	29.17
Washington.....	33	63,214	3.7	31.37
Michigan.....	172	57,501	3.3	41.34
New York.....	527	49,220	2.9	39.42
Pennsylvania.....	591	44,213	2.6	37.50
Vermont.....	195	30,344	1.8	32.15
All other states (see Table 42).....	453	54,335	3.2	31.35

<sup>1</sup> WHITE PINE (*Pinus strobus*) is the white pine cut in the Lake states, the Northeastern states, and the Appalachian region.

NORWAY (OR RED) PINE (*Pinus resinosa*), though botanically a yellow pine, is cut in the Lake states and largely marketed with white pine.

JACK PINE (*Pinus banksiana*) is cut in the Lake states.

WESTERN WHITE PINE (*Pinus monticola*) is cut in Idaho, Montana, Washington, and Oregon.

## SPRUCE.

Several species are included in the statistics of spruce lumber. The most important are the red

spruce of the Northeastern states and the Appalachian Mountain ranges as far south as northern Georgia, and the Sitka spruce of the west coast.

The lumber production has been substantially the same for the past three years. In 1917 the annual cut from this species fell below one billion feet for the first time since 1899. The largest annual cut of record was 1,748,547,000 feet for 1909.

The heavy demand on this timber for pulp has materially affected the cut of lumber, not only on account of the depletion of the supply but also because the high prices of pulp wood prevailing at this period made it more profitable to cut spruce for pulp than for lumber, particularly as small sizes and poor grades can be utilized by the pulp mills.

Until 1918 Maine was the leading spruce lumber-producing state for all years for which records are available. In that year it dropped to third place, while Washington advanced to first place and Oregon to second. In 1919 Washington was still the leading state, but Maine occupied second place and Oregon third. These three states together furnished nearly 62 per cent of the total cut of spruce lumber for 1919. The average cut of spruce per mill in the United States was 605,292 feet. The average cut per mill in Washington was 3,695,887 feet.

The average value at the mill per thousand feet of spruce lumber for 1916 was \$17.58; for 1917, \$24.41; for 1918, \$28.65; and for 1919, \$30.76.

TABLE 13.—PRODUCTION OF SPRUCE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1,619	979,968	100.0	\$30.76
Washington.....	62	220,145	23.4	24.69
Maine.....	395	208,045	21.3	34.93
Oregon.....	31	189,056	19.0	25.00
New Hampshire.....	128	75,811	7.7	38.02
Vermont.....	370	58,059	5.9	33.69
West Virginia.....	17	50,414	5.1	39.10
North Carolina.....	69	42,976	4.4	32.57
Montana.....	20	34,034	3.5	25.24
New York.....	152	29,341	3.0	40.04
Minnesota.....	79	20,298	3.0	31.61
Colorado.....	55	16,018	1.6	28.01
Wisconsin.....	46	10,046	1.1	32.20
Michigan.....	58	8,417	0.9	36.36
All other states (see Table 42).....	137	21,078	2.2	31.02

<sup>1</sup> RED SPRUCE (*Picea rubens*) is the principal species cut in the Northeastern states and the Appalachian region.

SITKA SPRUCE (*Picea sitchensis*) is the principal species cut in Oregon and Washington.

BLACK SPRUCE (*Picea mariana*) is cut in limited quantities in the Northeastern states.

WHITE SPRUCE (*Picea canadensis*) is cut in the Lake states, New York, and northern New England.

ENGELMANN SPRUCE (*Picea engelmannii*) is cut in the Rocky Mountain region.

#### MAPLE.

Maple is well distributed, and all principal timber regions of the United States, including the southern yellow pine group and the western Rocky Mountain group, are represented in Table 14. Sugar maple or hard maple is the most common and most valuable of the several species of maple cut into lumber. This tree reaches its greatest development in the Northern

states, and while it grows as far south as Florida and Texas, it is not abundant in the South. The most important maple lumber-producing state is Michigan, and in 1919 this state contributed 37.5 per cent of the total cut for the United States.

The largest cut of record was 1,106,604,000 feet reported for 1909. The cut for 1919, compared with that for 1909, shows a decrease of 22.5 per cent. The average cut of maple lumber per mill in the United States for 1919 was 187,102 feet. The average cut per mill in Michigan was 1,260,427 feet.

In common with all other woods, the price per thousand feet at the mill for maple has increased, the average values for the past four years being reported as follows: 1916, \$18.24; 1917, \$23.16; 1918, \$29.05; and 1919, \$35.56.

TABLE 14.—PRODUCTION OF MAPLE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	4,583	857,489	100.0	\$35.56
Michigan.....	255	321,409	37.5	35.97
Wisconsin.....	300	177,125	20.7	33.10
West Virginia.....	226	58,242	6.8	38.36
New York.....	724	50,884	6.0	38.41
Pennsylvania.....	595	48,010	5.7	35.39
Ohio.....	445	34,787	4.1	35.54
Indiana.....	413	33,306	3.9	45.17
Vermont.....	340	33,280	3.9	33.34
North Carolina.....	125	11,977	1.4	31.44
New Hampshire.....	96	9,562	1.1	34.06
All other states (see Table 42).....	1,064	72,208	8.4	32.96

<sup>1</sup> SUGAR (OR HARD) MAPLE (*Acer saccharum*) is cut principally in the Northern states.

SILVER (OR SOFT) MAPLE (*Acer saccharinum*) is also cut in the Northern states.

RED (OR SOFT) MAPLE (*Acer rubrum*) is the principal species cut in the Southern states.

OREGON MAPLE (*Acer macrophyllum*) is cut in the Pacific Coast states.

#### RED GUM.

Red gum is a southern tree and is not abundant north of the Ohio River. It is of growing importance in the lumber industry and in 1919 ranked ninth among the species in the production of lumber. In 1914 it ranked tenth and in 1909, eleventh.

The reported lumber cut of red gum for 1919 in the United States was greater than that for any other year for which figures are available, the next largest annual cut, 772,514,000 feet, being reported for 1913. In 1919 this wood was used in greater quantities than any other in the manufacture of veneers and slack cooperage staves.

Arkansas has led in the production of this lumber for all years of record since 1899. Mississippi, Louisiana, and Tennessee, in the order named, have been next in importance for the past several years. In 1919 Arkansas, Mississippi, and Louisiana reported 65 per cent of the total quantity cut.

The average value at the mill per thousand feet of red gum, like that for all other species, has increased rapidly for the past four years, and was reported as follows: \$14.64 for 1916, \$19.56 for 1917, \$23.21 for 1918, and \$32.68 for 1919.

TABLE 15.—PRODUCTION OF RED-GUM<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,684	851,431	100.0	\$32.68
Arkansas.....	476	238,327	28.0	34.54
Mississippi.....	190	168,226	19.8	34.56
Louisiana.....	113	147,260	17.3	33.64
Tennessee.....	406	89,025	9.4	33.82
Alabama.....	171	39,349	4.6	25.36
Kentucky.....	301	31,692	3.7	25.17
Missouri.....	73	31,105	3.7	32.80
South Carolina.....	33	21,917	2.6	30.58
North Carolina.....	145	21,507	2.5	29.57
Virginia.....	100	16,858	2.0	22.61
Georgia.....	30	15,510	1.8	31.37
Texas.....	41	11,924	1.4	24.58
All other states (see Table 42).....	605	27,701	3.3	30.13

<sup>1</sup> RED (OR SWEET) GUM (*Liquidambar styraciflua*) is the only species that goes into red-gum lumber. Commercial sap gum is the sapwood of the red gum.

## CYPRESS.

Cypress grows in low regions subject to inundation in the southern and eastern part of the United States. It has long been important as lumber and for several years the annual cut reported exceeded 1,000,000,000 feet. Since 1915 the cut has decreased and the output in 1918, 578,026,000 feet, was the smallest since 1899. The cut in 1919 exceeded that of 1918 by 78,186,000 feet, or 13.5 per cent.

Louisiana has been the leading state in the production of lumber from this wood for all years for which records are available and for several years contributed one-half or more of the total production in the United States. Florida, the next state in importance, contributed 18.4 per cent of the total cut in 1919.

The average cut of cypress lumber per mill in the United States for 1919 was 972,166 feet. In Louisiana the average cut per mill was 3,112,515 feet. The average value at the mill per thousand feet of cypress lumber for 1916 was \$20.85; for 1917, \$23.92; for 1918, \$30.56; and for 1919, \$38.38.

TABLE 16.—PRODUCTION OF CYPRESS<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	675	656,212	100.0	\$38.38
Louisiana.....	99	308,139	47.0	40.54
Florida.....	36	120,433	18.4	37.26
Georgia.....	35	43,440	6.6	41.85
Arkansas.....	163	43,335	6.6	34.44
Missouri.....	48	41,406	6.3	33.27
South Carolina.....	37	27,482	4.2	38.68
North Carolina.....	74	17,408	2.7	39.88
Mississippi.....	67	17,291	2.6	35.85
Alabama.....	23	13,770	2.1	37.00
All other states (see Table 42).....	103	23,382	3.6	33.58

<sup>1</sup> BALD CYPRESS (*Taxodium distichum*) is the one species cut as such.

## CHESTNUT.

The cut of chestnut lumber for 1919 increased more than 200,000,000 feet, or 58.2 per cent, compared with the cut for 1918 which was the smallest since 1905.

The greatest production reported for any one year of this kind of lumber was 663,891,000 feet in 1909.

Doubtless the chestnut blight has greatly affected the cut of lumber from this species. In order to save the timber from being a total loss, it has been singled out and cut in preference to other timber.

Pennsylvania, prior to 1909, was for several years the leader in the production of chestnut lumber. Since that time, however, this state has been out-ranked by West Virginia.

The average value at the mill per thousand feet of chestnut lumber for 1916 was \$17.05; for 1917, \$21.54; for 1918, \$27.31; and for 1919, \$32.30.

TABLE 17.—PRODUCTION OF CHESTNUT<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	4,244	545,696	100.0	\$32.30
West Virginia.....	335	118,087	21.6	35.01
Pennsylvania.....	1,032	85,777	15.7	31.13
North Carolina.....	367	69,507	12.7	31.57
Virginia.....	446	69,453	12.7	31.04
Connecticut.....	221	44,644	8.2	31.09
Tennessee.....	317	39,511	7.2	32.13
Massachusetts.....	141	30,222	5.5	28.96
Kentucky.....	331	24,850	4.6	31.68
New York.....	391	14,863	2.7	31.33
Maryland.....	199	14,287	2.6	30.63
Ohio.....	165	11,849	2.2	41.62
All other states (see Table 42).....	229	22,650	4.2	31.43

<sup>1</sup> CHESTNUT (*Castanea dentata*) is the only species included in chestnut lumber.

## REDWOOD.

Redwood lumber was reported exclusively from California. It is cut chiefly from the coast redwood, which grows in a narrow belt along the coast north of San Francisco, and the bigtree, which is confined to a limited region on the western slope of the Sierras. Owing to the extremely large size of the trees and the rough character of much of the ground on which they stand, the logging and manufacturing of redwood is one of the most difficult and expensive lumbering operations in the United States. Comparatively few mills are engaged in the industry, but their output is relatively large. The average cut per mill in 1919 was 12,437,636 feet, which was greater than that for any other species. The production since 1899 for all years for which records are available has been fairly constant, the largest cut being 659,678,000 feet in 1906. The average value at the mill per thousand feet of redwood lumber for 1916 was \$13.93; for 1917, \$21.00; for 1918, \$24.30; and for 1919, \$30.04.

TABLE 18.—PRODUCTION OF REDWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	33	410,442	100.0	\$30.04
California.....	33	410,442	100.0	30.04

<sup>1</sup> REDWOOD (*Sequoia sempervirens*) is the species chiefly cut; BIGTREE (*Sequoia washingtoniana*) furnishes a minor part of the redwood production.

## LARCH.

Two species, tamarack or larch of the Eastern and Northern states and western larch of the Rocky Mountain region and the west coast, contribute to the total cut of larch lumber. The western species supplied about 85 per cent of the total cut in 1919.

The production of lumber from this species has been fairly constant since 1907, the largest cut, 421,214,000 feet, being reported for 1909. Of this amount, Montana, Idaho, Washington, and Oregon contributed 62.7 per cent. The cut of lumber from this wood in the Lake states—Michigan, Minnesota, and Wisconsin—has been decreasing rapidly, and the 1919 output was only a little more than one-third as large as that for 1909, which was reported as 155,430,000 feet.

Montana and Idaho have been the leading two states for several years. Idaho occupying first place in 1918 and 1919. In 1919 these two states contributed 63.1 per cent of the total cut of larch lumber in the United States.

The average cut of larch lumber per mill in the United States for 1919 was 831,094 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$12.49; for 1917, \$16.21; for 1918, \$19.86; and for 1919, \$23.39.

TABLE 19.—PRODUCTION OF LARCH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	467	388,121	100.0	\$23.39
Idaho.....	50	143,055	36.9	22.15
Montana.....	42	101,714	26.2	22.61
Washington.....	67	63,870	16.5	21.70
Minnesota.....	110	35,765	9.2	28.48
Oregon.....	12	18,068	4.6	23.84
Wisconsin.....	94	14,733	3.8	20.71
All other states (see Table 42).....	92	10,016	2.6	31.60

<sup>1</sup> WESTERN LARCH (*Larix occidentalis*) is the species cut in the inland empire and the Pacific northwest.

TAMARACK, or LARCH (*Larix laricina*), is cut in the Lake states and New England states.

## BIRCH.

Several species of birch contributed to the lumber output, but two furnished most of the market supply. These are the yellow birch of the Lake states, New York, and New England and the sweet birch cut in Pennsylvania and southward. The wood of the two species is very similar.

A considerable quantity of birch is sawed directly into bars for spools and a variety of other small turned articles known to the trade as novelties. The wood takes a fine finish and is used extensively for furniture and interior finish. This wood is also used extensively in the manufacture of veneers, ranking third in quantity among the various woods used for that purpose in 1919.

Wisconsin has reported the largest cut of birch lumber for each year for which records are available since 1899, except in 1904, when Michigan led and

Wisconsin occupied second place. For the past several years Michigan has ranked second. The largest annual output for all states was 452,370,000 feet reported for 1909. Of this amount, Wisconsin furnished nearly 40 per cent. In 1919 the cut of these two states supplied 63.5 per cent of the total output for the United States, although 25 other states are represented in the statistics.

The average value at the mill per thousand feet of birch lumber for 1916 was \$19.59; for 1917, \$24.07; for 1918, \$29.94; and for 1919, \$35.79.

TABLE 20.—PRODUCTION OF BIRCH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	1,922	375,079	100.0	\$35.79
Wisconsin.....	213	174,873	46.6	35.70
Michigan.....	141	63,533	16.9	39.29
New York.....	293	29,719	7.9	39.71
Vermont.....	328	20,391	5.4	33.31
Maine.....	131	21,533	5.7	33.77
New Hampshire.....	111	12,220	3.3	32.54
Pennsylvania.....	253	10,541	2.8	33.46
Minnesota.....	61	9,980	2.7	25.12
All other states (see Table 42).....	391	26,271	7.0	34.13

<sup>1</sup> YELLOW BIRCH (*Betula lutea*) is the principal species cut in the Lake states, New England, and New York.

PAPER BIRCH (*Betula papyrifera*) and WHITE (or GRAY) BIRCH (*Betula populifolia*) are also cut to a limited extent in New England.

SWEET (or CHERRY) BIRCH (*Betula lenta*) is cut in West Virginia and Pennsylvania.

RIVER (or RED) BIRCH (*Betula nigra*) is cut in the Southern states.

## BEECH.

The production of beech lumber in 1919 was reported by 28 states, all of which are east of the Rocky Mountains. The total output reported for 1919 increased 40.6 per cent compared with the cut reported for 1918, but decreased 29.8 per cent compared with that for 1909, which was the largest of record.

For all years for which records are available from 1905 to 1918, inclusive, Michigan led in the production of this lumber. In 1919, however, Indiana reported a larger production and Michigan dropped to second place.

The average value at the mill per thousand feet of beech lumber for 1916 was \$16.20; for 1917, \$19.58; for 1918, \$25.06; and for 1919, \$29.98.

TABLE 21.—PRODUCTION OF BEECH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,751	358,985	100.0	\$29.98
Indiana.....	498	57,107	15.9	31.54
Michigan.....	162	49,125	13.7	31.21
Pennsylvania.....	394	39,247	10.9	30.03
New York.....	572	38,463	10.7	30.73
Ohio.....	493	37,907	10.6	28.85
Kentucky.....	457	37,459	10.4	25.33
West Virginia.....	257	30,073	8.4	33.04
Vermont.....	225	14,572	4.1	31.32
Tennessee.....	283	14,290	4.0	29.86
All other states (see Table 42).....	410	40,742	11.3	28.12

<sup>1</sup> BEECH (*Fagus atropurpurea*) is the only species that goes into beech lumber.

CEDAR.

Of the many species classed as cedar in the reports of the sawmill industry, the most important is the western red cedar, ranging from Idaho to the Pacific coast. Other important western species are yellow cedar, Port Orford cedar, and incense cedar, the last mentioned being found in the Sierra Nevada Mountains of California and southern Oregon.

The most important of the eastern cedars represented in the lumber statistics is red cedar, which grows from Maine to South Dakota and southward to Texas and Florida, although the commercial production is limited to Tennessee, Florida, and Alabama. It is in great demand for lead pencils.

The production of lumber does not represent the only drain on the cedar timber, since a large quantity of this wood is consumed in the manufacture of shingles, poles, posts, and ties. The greatest production of cedar lumber for any one year for which records are available was in 1914, the cut for that year being reported as 499,903,000 feet. Washington has been the greatest producer, furnishing in 1919 more than three-fifths of the total output in the United States.

The average cut per mill of cedar lumber in the United States for 1919 was 600,785 feet. In Washington the average cut per mill was 2,667,442 feet. The average value at the mill per thousand feet of cedar lumber for 1916 was \$15.24; for 1917, \$19.40; for 1918, \$24.86; and for 1919, \$33.80.

TABLE 22.—PRODUCTION OF CEDAR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	553	332,234	100.0	\$33.80
Washington.....	77	205,393	61.8	31.74
Oregon.....	32	82,763	9.9	31.67
Idaho.....	21	20,165	7.9	28.55
California.....	37	20,406	6.1	23.50
Tennessee.....	107	14,708	4.4	71.27
Maine.....	71	7,445	2.2	32.57
New Jersey.....	20	5,010	1.5	46.35
North Carolina.....	10	4,136	1.2	65.73
Michigan.....	34	4,014	1.2	30.06
Kentucky.....	10	2,513	0.8	71.85
All other states (see Table 42).....	116	9,681	2.9	36.11

<sup>1</sup> WESTERN RED CEDAR (*Thuja plicata*) is cut in Washington, Oregon, and Idaho. PORT ORFORD CEDAR (*Chamaecyparis lawsoniana*) is cut in Oregon. ALASKA or YELLOW CEDAR (*Chamaecyparis Nootkatensis*) is cut in Washington. INCENSE CEDAR (*Libocedrus decurrens*) is cut in California. NORTHERN WHITE CEDAR (or ARBORVITÆ) (*Thuja occidentalis*) is cut in the Lake states and the Northeastern states. SOUTHERN WHITE CEDAR (or "JUNIPER") (*Chamaecyparis thuyoides*) is cut in the Atlantic Coast states. RED CEDAR (*Juniperus virginiana*) and SOUTHERN RED JUNIPER (*Juniperus barbadensis*) are cut principally in Tennessee, Florida, and Alabama.

YELLOW POPLAR.

Yellow poplar, or tulip poplar, lumber is cut from only one species. This tree grows principally in the Appalachian Mountain region and is not found in solid stands but is mixed in with other hardwoods. The principal producing states are West Virginia, Tennessee, Kentucky, Virginia, and North Carolina,

although 23 other states reported yellow poplar lumber in 1919.

West Virginia has been the leading state for a number of years and in 1919 furnished nearly one-fifth of the total cut of the United States. The greatest cut for any one year for which figures are available was 862,849,000 feet for 1907. Of this amount, Kentucky reported 23.9 per cent.

The average value at the mill per thousand feet of yellow poplar lumber for 1916 was \$21.89; for 1917, \$27.17; for 1918, \$35.06; and for 1919, \$41.65.

TABLE 23.—PRODUCTION OF YELLOW POPLAR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	3,278	328,538	100.0	\$41.65
West Virginia.....	305	63,827	19.4	45.68
Tennessee.....	569	53,492	16.3	42.14
Kentucky.....	488	50,462	15.4	40.83
Virginia.....	429	44,205	13.5	39.03
North Carolina.....	263	25,298	7.7	37.14
Alabama.....	177	20,998	6.4	35.26
Georgia.....	78	18,575	5.7	39.77
Ohio.....	198	12,269	3.7	50.45
All other states (see Table 42).....	771	39,412	12.0	42.78

<sup>1</sup> YELLOW POPLAR (*Liriodendron tulipifera*) is the only species that goes into poplar lumber.

WHITE FIR.

The species sold as white fir are all western, and include, besides the true white fir (*Abies concolor*), several species cut in the Rocky Mountains and west coast regions of the United States.

Of the 10 States contributing to the total cut of white fir lumber in 1919, California was the principal producer, reporting 48.5 per cent of the total for the United States. Prior to 1905, the cut from this species was not reported separately, and the figures for 1919 show a larger production than any previous year of record.

The average cut of white fir lumber per mill in the United States for 1919 was 1,460,275 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$12.25; for 1917, \$17.16; for 1918, \$19.61; and for 1919, \$25.66.

TABLE 24.—PRODUCTION OF WHITE FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	153	223,422	100.0	\$25.66
California.....	49	108,374	48.5	27.50
Idaho.....	27	65,404	29.3	25.09
Oregon.....	20	22,731	10.2	23.53
Washington.....	33	17,979	8.0	19.86
All other states (see Table 42).....	34	8,934	4.0	24.93

<sup>1</sup> WHITE FIR (*Abies concolor*) is cut only in the West. Marketed as white fir are: GRAND FIR (*Abies grandis*), cut mostly in Idaho and Montana. SILVER FIR (*Abies amabilis*), cut chiefly in Washington. RED FIR (*Abies magnifica*), cut chiefly in California. ALPINE FIR (*Abies lasiocarpa*), cut chiefly in the northern Rocky Mountain and Cascade Mountain regions.

## ELM.

White elm is by far the most important of the many varieties of elm that enter into the statistics of the production of lumber. Elm grows in practically every state east of the Rocky Mountains, and lumber sawed from this wood was reported by 34 states for 1919. The timber is being depleted, however, and this is reflected in the production figures which show a large decrease for the past 20 years. In 1899 the total cut of elm lumber was 456,731,000 feet, which has not been equaled since that time.

Wisconsin and Michigan have been the leading states for the past several years, and in 1919 these two states, together with Indiana, produced 52.9 per cent of the total cut.

This is an important wood in the production of slack cooperage stock, and large quantities are used in the manufacture of staves, heading, and hoops each year.

The average value at the mill per thousand feet of elm lumber for 1916 was \$19.46; for 1917, \$23.89; for 1918, \$28.19; and for 1919, \$36.39.

TABLE 25.—PRODUCTION OF ELM<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Numl or of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,000	194,417	100.0	\$36.39
Wisconsin.....	242	51,242	26.4	36.79
Michigan.....	191	30,745	15.8	40.11
Indiana.....	333	20,833	10.7	41.77
Arkansas.....	113	18,742	9.6	35.95
Ohio.....	301	12,405	6.4	35.25
Tennessee.....	188	10,755	5.5	37.70
Missouri.....	192	10,230	5.3	30.86
Mississippi.....	53	7,778	4.0	36.70
Minnesota.....	90	5,831	3.0	26.30
New York.....	346	5,710	2.9	32.64
Louisiana.....	40	5,188	2.7	31.12
Illinois.....	97	4,762	2.4	33.77
All other states (see Table 42).....	414	10,190	5.2	30.11

<sup>1</sup> WHITE (or SOFT) ELM (*Ulmus americana*) is cut in all of the states east of the Rocky Mountains.

SLIPPERY (or RED, or SOFT) ELM (*Ulmus pubescens*) is cut in the same region as white elm.

CORK (or TRUE ROCK) ELM (*Ulmus racemosa*) is cut in the Lake states.

WING ELM (*Ulmus alata*) and CEDAR ELM (*Ulmus crassifolia*) are occasionally cut in the lower Mississippi Valley.

## BASSWOOD.

The basswood, or linn, which is most abundant in the Lake states, and the white basswood of the Appalachian Mountain region are the most important species cut into lumber. These woods are very similar and usually no distinction is made by the trade.

The leading states in the production of basswood lumber for the past 20 years have been Wisconsin and Michigan. In 1919 these two states reported 56.2 per cent of the total cut for the United States. The largest annual cut reported since 1899 was 399,151,000 feet in 1909. Of this amount, Wisconsin furnished one-third.

The average value at the mill per thousand feet of basswood lumber for 1916 was \$21.05; for 1917, \$25.96; for 1918, \$34.00; and for 1919, \$40.03.

TABLE 26.—PRODUCTION OF BASSWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,202	182,562	100.0	\$40.03
Wisconsin.....	251	60,545	37.9	39.78
Michigan.....	158	33,532	18.3	42.38
West Virginia.....	137	15,200	8.3	40.86
New York.....	532	10,983	6.0	40.36
Virginia.....	56	7,591	4.1	37.54
Ohio.....	141	7,363	4.0	49.17
All other states (see Table 42).....	927	39,252	21.4	36.81

<sup>1</sup> BASSWOOD (or LINN) (*Tilia americana*) is cut principally in the Lake states. WHITE BASSWOOD (*Tilia heterophylla*) is cut in the Appalachian Mountain region. DOWNY BASSWOOD (*Tilia pubescens*) is cut in limited quantity in the Southern states.

## HICKORY.

Hickory is well distributed throughout the Mississippi Valley and the eastern part of the United States. It does not grow in pure stands but is scattered through other hardwood forests.

Indiana, Arkansas, and Tennessee have at different times since 1899 led in the production of lumber from hickory, and for the past four years Arkansas has been the leading state. The production of lumber from this wood was reported by 29 states for 1919. Arkansas, Tennessee, and Kentucky, however, furnished 52.6 per cent of the total output.

A large quantity of hewn and split hickory stock goes directly into vehicle stock, tool handles, etc., and is therefore not included in the statistics of the lumber cut.

The average value at the mill per thousand feet of hickory lumber for 1916 was \$23.84; for 1917, \$29.48; for 1918, \$37.95; and for 1919, \$44.37.

TABLE 27.—PRODUCTION OF HICKORY<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,646	170,013	100.0	\$44.37
Arkansas.....	241	42,288	24.9	44.11
Tennessee.....	290	28,235	16.6	46.91
Kentucky.....	272	18,928	11.1	41.57
West Virginia.....	228	11,035	6.8	37.97
Indiana.....	330	11,594	6.8	51.79
Mississippi.....	59	11,265	6.6	45.73
Ohio.....	319	9,606	5.7	46.27
Louisiana.....	33	6,206	3.7	52.81
North Carolina.....	67	5,591	3.3	34.23
Pennsylvania.....	183	4,050	2.7	35.79
Alabama.....	60	4,452	2.6	45.79
All other states (see Table 42).....	555	15,593	9.2	43.46

<sup>1</sup> Several species of hickory are cut, the principal ones being SHAGBARK (*Hicoria ontario*), SHELLBARK (*Hicoria laciniata*), PIGNUT (*Hicoria glabra*), BITTERNUT (*Hicoria mitis*), and MOCKERNUT (*Hicoria alba*).

ASH.

Ash timber grows scattered in with other woods and is not found in solid stands. Many varieties grow in the United States, the principal lumber-producing species being the white ash, black ash, and green ash.

In 1919, 36 states reported the production of ash lumber. For many years Michigan was the chief producer, but during the past several years Arkansas and Louisiana have been the leading states.

The largest production of record during the past 20 years was 291,209,000 feet in 1909. Large quantities of ash are consumed in the manufacture of cooperage stock, both tight and slack, which do not figure in the lumber production.

The average value at the mill per thousand feet of ash lumber for 1916 was \$23.85; for 1917, \$30.01; for 1918, \$38.70; and for 1919, \$52.69.

TABLE 28.—PRODUCTION OF ASH<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	2,502	154,931	100.0	\$52.09
Arkansas.....	125	23,042	15.3	54.55
Louisiana.....	07	19,825	12.8	52.82
Indiana.....	239	14,619	9.4	74.10
Wisconsin.....	141	14,046	9.1	36.42
Tennessee.....	155	14,008	9.0	66.37
Mississippi.....	63	10,258	6.6	55.75
Ohio.....	248	8,332	5.4	61.52
Michigan.....	125	6,611	4.3	39.52
New York.....	395	5,106	3.3	43.30
Kentucky.....	98	4,870	3.1	42.16
West Virginia.....	85	4,052	2.6	55.47
Pennsylvania.....	209	3,708	2.5	45.00
Georgia.....	10	3,656	2.4	63.02
Missouri.....	52	3,484	2.2	47.07
All other states (see Table 42).....	540	18,623	12.0	39.59

<sup>1</sup> Lumber trade practice specifies white ash and brown ash. The former is cut from the white ash tree and the latter from the black ash tree.  
 WHITE ASH (*Fraxinus americana*) is cut principally in the Central states.  
 GREEN ASH (*Fraxinus lanceolata*) is cut principally in the Southern states.  
 BLACK ASH (*Fraxinus nigra*) is cut in the Lake states and Northeastern states.  
 RED ASH (*Fraxinus pennsylvanica*) is cut in limited quantity in the Eastern states.  
 OREGON ASH (*Fraxinus oregona*) is cut in the Pacific northwest.

COTTONWOOD.

The different species included under the common name "cottonwood" are widely distributed and the production of lumber from these species was reported by 37 states for 1919. Mississippi and Arkansas have been the leading states since 1899, and Missouri, Louisiana, and Minnesota, also, have been important producers of lumber from this wood during the two decades. The largest annual cut of cottonwood lumber reported during this period was 415,124,000 feet for 1899. Since that time the annual output has been decreasing.

Large quantities of cottonwood, particularly the aspen or popple, are cut for pulpwood, and no doubt this has considerable influence on the lumber output.

The average value at the mill per thousand feet of cottonwood lumber for 1916 was \$17.42; for 1917, \$23.19; for 1918, \$26.13; and for 1919, \$32.24.

TABLE 29.—PRODUCTION OF COTTONWOOD<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	787	144,155	100.0	\$32.24
Mississippi.....	41	37,094	25.7	30.16
Minnesota.....	110	30,135	20.9	23.45
Arkansas.....	66	26,426	18.3	39.02
Missouri.....	74	11,130	7.7	37.14
Louisiana.....	29	8,421	5.8	36.64
Tennessee.....	22	6,552	4.5	38.11
Iowa.....	50	4,797	3.3	43.91
Michigan.....	41	4,313	3.0	34.62
Oklahoma.....	13	1,761	1.2	22.80
Illinois.....	39	1,565	1.1	33.95
Indiana.....	70	1,372	1.0	33.00
Florida.....	3	1,370	1.0	36.41
Oregon.....	2	1,265	0.9	15.25
Wisconsin.....	43	1,197	0.8	33.55
All other states (see Table 42).....	184	6,757	4.7	31.25

<sup>1</sup> COMMON COTTONWOOD (*Populus deltoides*) is the species most commonly cut east of the Rocky Mountains and more particularly in the lower Mississippi Valley.  
 SWAMP COTTONWOOD (*Populus tremulophylla*) is cut in the Mississippi Valley states.  
 ASPEN (or POPPLE) (*Populus tremuloides*) is cut in the Lake states and the Northeastern states, and to a limited extent in the Rocky Mountains and farther west.  
 LARGE-TOOTHED ASPEN (*Populus grandidentata*) is cut in the Lake states and Northeastern states.  
 BALM OF GILEAD (*Populus balsamifera*) is cut in the Lake states and Eastern states.  
 BLACK COTTONWOOD (*Populus trichocarpa*) is cut in the Pacific Coast states.

TUPELO.

Several species are included under the heading "Tupelo" in these statistics. The most important contributor to the supply of tupelo lumber is the true tupelo (*Nyssa aquatica*), a large tree growing in flat, swampy lands in the Southern and Gulf states. Black gum, which is found in the same section and farther north, also contributes a considerable proportion to the total.

The production of tupelo lumber was shown separately for the first time for 1905, and the greatest annual production of record was 249,992,000 feet, reported for 1917. Louisiana has been the chief producer of tupelo lumber for several years, and for 1919 reported more than three-fifths of the total cut.

A considerable quantity of tupelo is used in the manufacture of veneers, which does not enter into the production figures for lumber.

The average value at the mill per thousand feet of tupelo lumber for 1916 was \$13.00; for 1917, \$18.06; for 1918, \$22.73; and for 1919, \$28.42.

TABLE 30.—PRODUCTION OF TUPELO<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	469	143,730	100.0	\$28.42
Louisiana.....	61	87,634	61.0	27.21
North Carolina.....	42	11,469	8.0	28.37
Arkansas.....	48	9,056	6.3	33.06
South Carolina.....	11	6,893	4.8	34.56
Mississippi.....	33	6,522	4.5	26.75
Alabama.....	14	4,975	3.5	32.82
Missouri.....	23	3,962	2.8	27.79
Tennessee.....	62	3,310	2.3	37.84
All other states (see Table 42).....	175	9,909	6.9	26.60

<sup>1</sup> TUPELO (or COTTON GUM) (*Nyssa aquatica*) is cut in the Gulf states.  
 BLACK GUM (or PEPPERIDGE) (*Nyssa sylvatica*) is cut in the Atlantic and Central states and is sold both as tupelo and black gum.  
 WATER GUM (*Nyssa biflora*) is cut to a small extent in the South Atlantic states.

## SUGAR PINE.

Sugar-pine forests extend several hundred miles along the Sierra Nevada Mountains in California and cover a considerable area in southern Oregon. The tree is the largest American pine, and the wood resembles white pine.

The annual cut of lumber from this species has not varied greatly since 1905. The largest output, 169,247,000 feet, was reported for 1916.

In 1919 the average cut per mill of sugar-pine lumber in California was 3,490,676 feet and in Oregon, 750,500 feet. The average value at the mill per thousand feet of this lumber for 1916 was \$16.77; for 1917, \$24.69; for 1918, \$28.26; and for 1919, \$35.99.

TABLE 31.—PRODUCTION OF SUGAR PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	43	133,658	100.0	\$35.99
California.....	37	129,155	96.6	36.35
Oregon.....	6	4,503	3.4	25.07

<sup>1</sup> SUGAR PINE (*Pinus lambertiana*) is the only species cut as such and is found commercially only in California and southern Oregon.

## BALSAM FIR.

Balsam fir is cut in the northern part of the United States as far west as Minnesota and in the Appalachian Mountain region as far south as North Carolina, nine states contributing to the total cut in 1919.

The cut of lumber from this species was first reported separately in 1905. Since that time, Maine has led in the production for each year for which records are available, the proportion of the total annual cut reported by this state ranging from 44.9 per cent in 1919 to 65.6 per cent in 1907.

The average value at the mill per thousand feet of balsam fir lumber for 1916 was \$16.49; for 1917, \$20.02; for 1918, \$27.27; and for 1919, \$32.23.

TABLE 32.—PRODUCTION OF BALSAM FIR<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	413	68,030	100.0	\$32.23
Maine.....	175	30,512	44.9	31.73
New Hampshire.....	19	15,000	23.5	37.72
Minnesota.....	66	10,584	15.6	25.20
Vermont.....	74	4,415	6.5	31.89
New York.....	25	2,616	3.8	35.69
All other states (see Table 42).....	54	3,913	5.8	31.38

<sup>1</sup> BALSAM FIR (*Abies balsamea*) is the only species cut as such.

## WALNUT.

Walnut lumber was reported by 28 states for 1919. The production during the past 20 years has been fairly constant, the largest annual output reported being less than 90,000,000 feet.

Missouri, Indiana, and Ohio have been the leading states in the production of this lumber since 1899.

During the past four years, Missouri has occupied first place, reporting for 1919 more than one-fifth of the total output for the United States.

Besides the quantity of walnut sawed into lumber, a considerable amount was consumed in the manufacture of veneers each year. It is the most suitable wood for all varieties of gunstocks of the common grades.

This is the highest priced native wood cut into lumber to any considerable extent. The average value at the mill per thousand feet for 1916 was \$42.38; for 1917, \$72.99; for 1918, \$77.60; and for 1919, \$72.13.

TABLE 33.—PRODUCTION OF WALNUT<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	688	39,218	100.0	\$72.13
Missouri.....	47	8,508	21.7	39.05
Indiana.....	133	6,416	16.4	80.59
Ohio.....	107	5,097	13.0	78.51
Iowa.....	15	5,074	12.9	124.00
Illinois.....	22	3,600	9.4	71.39
Tennessee.....	80	2,746	7.0	57.37
Kansas.....	3	2,580	6.6	99.00
Kentucky.....	75	2,033	5.2	53.39
All other states (see Table 42).....	206	3,074	7.8	57.08

<sup>1</sup> BLACK WALNUT (*Juglans nigra*) is the only species cut as such.

## SYCAMORE.

Sycamore has not attained great prominence as a lumber timber. The trees are scattered, usually growing on the banks of rivers and smaller streams. It is what might be termed a waste-ground tree and resembles cottonwood in choice of location and habits of growth.

The production of sycamore lumber is well distributed and was reported from 23 states for 1919. The largest cut reported for any year for which records are available was 56,511,000 feet for 1909. The output during the past four years has been practically constant, the leading state during this period being Arkansas. Indiana has occupied second place, except for 1917, when Tennessee reported a greater production.

TABLE 34.—PRODUCTION OF SYCAMORE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	819	28,114	100.0	\$30.32
Arkansas.....	56	8,767	31.2	31.88
Indiana.....	191	4,580	16.3	31.77
Missouri.....	102	3,173	11.3	28.57
Tennessee.....	54	2,247	8.0	31.98
Kentucky.....	80	2,190	7.8	23.40
Illinois.....	48	1,474	5.2	31.00
Ohio.....	97	1,355	4.8	33.90
All other states (see Table 42).....	191	4,310	15.3	28.22

<sup>1</sup> SYCAMORE (*Platanus occidentalis*) is the only species cut as such.

The average value at the mill per thousand feet of sycamore lumber for 1916 was \$14.65; for 1917, \$18.68; for 1918, \$23.59; and for 1919, \$30.32.

LOGEPOLE PINE.

Lodgepole pine is most abundant in the western mountains. This wood grows very slowly and the trees do not reach saw-log size until about 100 years old. Although extensive areas are covered with young trees, the cut from lodgepole pine will probably not figure prominently in the lumber output for the United States.

The cut of this species was reported separately for the first time for 1909. It has not been very important as a lumber timber, the largest cut reported for any one year for which records are available being 33,014,000 feet for 1911.

For 1919 the lumber production from this wood was reported by six states, Colorado furnishing nearly 80 per cent of the total cut.

The average value at the mill per thousand feet of lodgepole pine lumber for 1916 was \$15.13; for 1917, \$18.34; for 1918, \$20.95; and for 1919, \$29.98.

TABLE 35.—PRODUCTION OF LODGEPOLE PINE<sup>1</sup> LUMBER, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (M feet b. m.).	Per cent distribution.	Average value per M feet, f.o.b. mill.
United States.....	75	16,281	100.0	\$29.98
Colorado.....	25	12,879	79.1	31.15
Utah.....	14	1,326	8.1	24.64
Wyoming.....	18	1,807	8.0	24.50
All other states (see Table 42).....	18	799	4.7	28.89

<sup>1</sup> LODGEPOLE PINE (*Pinus contorta*) is the only species cut as such.

MINOR SPECIES.

The production of lumber from 23 kinds of wood not cut into lumber in sufficient quantities to warrant separate statistics was included in the total output reported for 1919.

Many of these woods, particularly mahogany, dogwood, and Spanish cedar, are used for special purposes and their average values are considerably higher than those of the more common woods. The quantity figures for minor species are not to be accepted as complete, since many mills include the cut of such woods with that of better known species.

The increase in the average values reported for most of these species is very marked. For instance, the average value of mahogany was reported as \$107.47 in 1916, \$128.06 in 1917, \$160.62 in 1918, and \$205.47 in 1919. The average value of all minor species reported in 1916 was \$57.29; in 1917, \$75.11; in 1918, \$82.80; and in 1919, \$114.89.

TABLE 36.—PRODUCTION OF LUMBER FROM MINOR SPECIES: 1919.

KIND OF WOOD.	Quantity reported (M feet b. m.).	Average value per M feet, f.o. b. mill.	Principal states reporting.
Total.....	61,308	\$114.89	
Mahogany.....	26,659	205.47	Louisiana, Kentucky, New York, and Massachusetts.
Cherry.....	10,060	47.94	West Virginia, Pennsylvania, New York, Indiana, Michigan, and Ohio.
Willow.....	6,571	34.43	Louisiana, Mississippi, Arkansas, Iowa, and Indiana.
Buckeye.....	4,536	32.32	Tennessee, North Carolina, Virginia, West Virginia, and Kentucky.
Locust.....	3,027	42.40	West Virginia, Pennsylvania, Virginia, Indiana, Arkansas, and Tennessee.
Pecan.....	2,227	32.52	Arkansas, Mississippi, Louisiana, and Tennessee.
Magnolia.....	2,200	28.01	Louisiana, Mississippi, and Texas.
Dogwood.....	1,530	161.99	Tennessee, Texas, North Carolina, and Georgia.
Persimmon.....	1,201	33.22	Tennessee, Florida, and Arkansas.
Hackberry.....	1,142	33.82	Arkansas, Ohio, Illinois, Oklahoma, Tennessee, and Missouri.
Butternut.....	881	33.67	Wisconsin, West Virginia, Virginia, Pennsylvania, and Indiana.
Red Bay.....	469	24.67	Georgia, Alabama, and South Carolina.
Spanish cedar.....	359	220.64	Louisiana and Illinois.
Cucumber.....	222	37.45	Pennsylvania, West Virginia, and Ohio.
Silverbell.....	81	28.88	Tennessee.
Apple.....	53	50.00	New York and Illinois.
Sassafras.....	32	32.78	Arkansas, Illinois, and Pennsylvania.
Alder.....	18	34.67	Washington and Oregon.
Holly.....	16	43.83	Arkansas and Louisiana.
Box elder.....	14	33.79	North Carolina.
Koko.....	8	120.00	Illinois.
Sourwood.....	1	33.00	North Carolina.
Coffeetree.....	1	32.00	Indiana.

Leading states and species.—The following statement shows the states which, in 1919, led in the production of lumber from one or more of the 29 principal species for which detailed statistics are presented in the preceding tables.

Of the 16 states shown in the statement, 2—Arkansas and Wisconsin—each led in the production of lumber from four kinds of wood; 3—California, Louisiana, and Washington—each led in the production from three kinds; 1—West Virginia—from two kinds; and 10 states each from one kind.

STATEMENT "A."

STATE.	Kind or kinds of wood in the cut of which the specified state ranked first in 1919.
Arkansas.....	Red gum, hickory, ash, and sycamore.
California.....	Redwood, white fir, and sugar pine.
Colorado.....	Lodgepole pine.
Idaho.....	Larch.
Indiana.....	Beech.
Louisiana.....	Yellow pine, cypress, and tupelo.
Maine.....	Balsam fir.
Michigan.....	Maple.
Minnesota.....	White pine.
Mississippi.....	Cottonwood.
Missouri.....	Walnut.
Oregon.....	Western yellow pine.
Tennessee.....	Oak.
Washington.....	Douglas fir, spruce, and cedar.
West Virginia.....	Chestnut and yellow poplar.
Wisconsin.....	Hemlock, birch, elm, and basswood.

In 1919, 12 states each reported more than 1,000,000 feet of lumber. In 10 of these states the output of a certain kind of lumber exceeded the combined output of all other kinds. In 8 of these states yellow pine contributed over one-half of the total cut, and in 2 states Douglas fir was the predominant wood. These states are shown in the following statement.

STATEMENT "B."

STATE.	Principal kind of wood cut in 1919.	Per cent that cut of specified kind of wood forms of total cut of state.
Alabama.....	Yellow pine.....	91.3
Arkansas.....	Yellow pine.....	59.2
California.....	Western yellow pine.....	35.3
Florida.....	Yellow pine.....	88.3
Louisiana.....	Yellow pine.....	78.1
Mississippi.....	Yellow pine.....	82.9
North Carolina.....	Yellow pine.....	75.0
Oregon.....	Douglas fir.....	69.7
Texas.....	Yellow pine.....	96.4
Virginia.....	Yellow pine.....	58.9
Washington.....	Douglas fir.....	78.1
Wisconsin.....	Hemlock.....	30.4

Average value of lumber, by kinds of wood (Table 37).—Comparative figures showing the average value per thousand feet of lumber at point of production for two decades are presented in Table 37. The average values shown in this table were based on returns from the majority of the merchant establishments reporting for each year. The values reported by establishments located in the various states and even by establishments located within certain districts naturally showed great differences, for the reason that the value at the mill depends largely on the local demand in the case of smaller mills, and the nearness of the market and shipping facilities in the case of larger plants.

During the period covered by these statistics a great change has taken place in the lumber industry in the United States. It is not expected that the average values at the mill will again reach as low a level as reported for the earlier years, and a decrease in the production of lumber may be looked for from year to year on account of the depletion of the timber supply.

TABLE 37.—AVERAGE VALUE OF LUMBER AT THE MILL PER M FEET B. M., BY KINDS OF WOOD, FOR SPECIFIED YEARS: 1899-1919.

KIND OF WOOD.	1919	1918	1917	1916	1915	1911	1910	1909	1907	1904	1899
All kinds.....	\$30.21	\$24.70	\$20.32	\$15.32	\$14.04	\$15.05	\$15.30	\$15.38	\$16.50	\$12.76	\$11.13
SOFTWOODS.											
Yellow pine.....	28.71	24.38	19.00	14.33	12.41	13.87	13.29	12.69	14.02	9.96	8.46
Douglas fir.....	24.62	18.77	16.28	10.78	10.59	11.05	13.00	12.44	14.12	9.51	8.67
Western yellow pine.....	27.75	20.87	19.59	14.52	14.32	13.92	14.25	15.39	15.07	11.30	9.70
Hemlock.....	29.16	23.97	20.78	15.35	13.14	13.59	13.85	13.95	15.53	11.01	9.98
White pine.....	32.83	30.84	24.81	10.16	17.44	18.54	18.93	18.16	19.41	14.93	12.69
Spruce.....	30.70	28.05	24.41	17.58	16.58	16.14	16.62	16.91	17.26	14.03	11.27
Cypress.....	38.38	30.56	23.02	20.85	19.85	20.54	20.51	20.46	22.12	17.50	13.32
Redwood.....	30.04	24.30	21.00	13.93	13.54	13.99	15.52	14.80	17.70	12.83	10.12
Larch (tamarack).....	23.30	19.88	16.21	12.49	10.78	11.87	12.33	12.08	13.99	11.39	8.73
Cedar.....	33.80	24.80	19.40	15.24	16.10	13.86	15.53	19.95	19.14	14.35	10.91
White fir.....	25.66	19.61	17.10	12.25	10.94	10.64	11.52	13.10	15.54	(1)	(1)
Sugar pine.....	35.99	28.20	24.09	19.77	17.40	17.52	18.08	18.14	19.84	(1)	12.30
Balsam fir.....	32.23	27.27	20.02	16.49	13.70	13.42	14.48	13.99	16.16	(1)	(1)
Lodgepole pine.....	29.98	20.95	18.34	15.13	13.57	12.41	14.88	19.25	(1)	(1)	(1)
HARDWOODS.											
Oak.....	37.87	31.11	24.49	20.06	18.78	19.14	18.76	20.50	21.23	17.51	13.78
Maple.....	35.59	29.05	23.16	18.24	15.21	15.49	18.16	15.77	19.84	14.94	11.83
Gum, red and sap.....	32.68	23.21	19.59	14.64	12.54	12.11	12.26	13.20	14.10	10.87	9.63
Chestnut.....	32.30	27.31	21.54	17.05	16.17	16.03	16.23	16.12	17.04	13.78	13.87
Birch.....	35.79	29.94	24.07	19.59	16.52	16.01	17.37	19.05	17.37	15.44	12.50
Beech.....	29.98	25.06	19.58	16.20	14.01	14.09	14.34	13.25	14.30	(1)	(1)
Yellow poplar.....	41.65	35.06	27.17	21.89	22.45	25.46	24.71	25.89	24.91	18.99	14.03
Elm.....	36.39	28.19	23.89	19.46	16.98	17.13	18.07	17.52	18.45	14.45	11.47
Basswood.....	40.03	34.00	25.95	21.05	18.89	19.20	20.94	19.50	20.03	16.86	12.84
Hickory.....	44.37	37.05	29.48	23.84	23.35	22.47	26.55	30.80	29.50	23.04	18.78
Ash.....	52.69	38.70	30.01	23.85	22.15	21.21	22.47	24.44	25.01	18.77	15.84
Cottonwood.....	32.24	26.13	23.19	17.42	17.86	18.12	17.78	18.05	18.42	14.92	10.37
Tupelo.....	28.42	22.73	18.06	13.00	12.25	12.46	12.14	11.87	14.48	(1)	(1)
Walnut.....	72.13	77.00	72.99	42.38	48.37	31.70	34.91	43.79	43.31	45.04	36.49
Sycamore.....	30.32	23.59	18.68	14.65	13.80	13.16	14.10	14.87	14.58	(1)	11.04

1 Data not obtained.

## LATH.

Comparative production (Table 38).—The output of lath fluctuates with the demand for building purposes and the slump in the building operations during 1918 and the increased demand for 1919 are reflected in the figures. The total number of mills reporting in 1918 was 909, the figures for 1919 being an increase of 24.6

per cent in the number of mills and 26.6 per cent in the total production. The largest cut of lath during the past 20 years was reported for 1906.

Production, by states (Table 39).—Lath is usually a by-product of sawmills. In 1919 only 18 establishments which did not saw lumber reported the production of lath, their combined output being 31,091,000 pieces, or 1.8 per cent of the total.

In 1919 Washington led in the production of lath. In 1918 Louisiana ranked first, Minnesota second, and Washington third.

TABLE 38.—PRODUCTION OF LATH FOR SPECIFIED YEARS: 1899-1919.

YEAR.	Quantity (thousands).	Average value per thousand.	YEAR.	Quantity (thousands).	Average value per thousand.
1919.....	1,724,078	\$4.31	1909.....	3,703,195	\$2.69
1918.....	1,302,187	(1)	1908.....	2,986,684	2.27
1917.....	2,281,738	(1)	1907.....	3,693,602	2.82
1916.....	2,754,683	(1)	1906.....	3,812,807	3.01
1915.....	2,745,134	(1)	1905.....	3,111,157	(1)
1912.....	2,710,163	(1)	1904.....	2,647,847	2.05
1911.....	2,971,110	2.61	1899.....	2,523,998	1.86
1910.....	3,494,718.	2.31			

<sup>1</sup> Not available.

TABLE 39.—PRODUCTION OF LATH, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (thousands).	Per cent distribution.	Average value per thousand.
United States.....	1,133	1,724,078	100.0	\$4.81
Washington.....	72	339,058	19.7	4.19
Louisiana.....	59	199,018	11.5	5.02
Wisconsin.....	82	138,936	8.1	5.27
Oregon.....	37	122,848	7.1	4.24
Minnesota.....	44	115,741	6.7	5.24
Maine.....	71	104,228	6.0	5.21
Mississippi.....	28	96,204	5.6	5.20
Florida.....	34	70,402	4.4	4.97
Arkansas.....	25	72,827	4.2	4.24
Idaho.....	23	69,150	4.0	3.72
California.....	18	53,042	3.1	4.43
Michigan.....	53	51,469	3.0	5.01
Alabama.....	24	42,502	2.5	5.88
Texas.....	10	35,916	2.1	5.17
Virginia.....	40	27,073	1.6	5.38
All other states (see Table 42).....	507	170,669	10.4	5.34

SHINGLES.

Comparative production (Table 40).—The production of shingles reflects to a certain extent the activities in building lines, but the substitution of other materials for roofing has doubtless affected the output considerably.

The largest cut during the past 20 years was reported for 1905 and the smallest for 1918. The 1919 cut compared with that of 1918 increased 61.6 per cent.

Washington has been the leading shingle state for all years since 1899 for which records are available. Michigan, Louisiana, and Oregon have each in turn occupied second place.

Production, by states (Table 41).—By far the greater number of establishments which produced shingles were also engaged in the manufacture of lumber. In 1919, however, 449 establishments which did not manufacture lumber reported the production of 5,830,345,000 shingles, or 63.4 per cent of the total quantity for the United States. More than one-half of the exclusive shingle mills were located in the Pacific Coast states, which is the main shingle-producing region, largely because of the particular adaptability of the western cedar.

Cedar is the principal wood sawed into shingles and, for those years for which records are available, it furnished about three-fourths of the total cut. Cypress is next in importance and contributed approximately one-tenth of the total output for the years for which such data were secured. The cut by kinds of wood was not ascertained for 1919.

TABLE 40.—PRODUCTION OF SHINGLES FOR SPECIFIED YEARS: 1899-1919.

YEAR.	Quantity (thousands).	Average value per thousand.	YEAR.	Quantity (thousands).	Average value per thousand.
1919.....	9,192,704	\$4.19	1909.....	14,907,371	\$2.03
1918.....	5,690,182	(1)	1908.....	12,106,483	2.00
1917.....	8,696,513	(1)	1907.....	11,824,475	2.55
1916.....	9,371,333	(1)	1906.....	11,858,260	2.04
1915.....	8,459,378	(1)	1905.....	15,340,909	(1)
1912.....	12,037,685	(1)	1904.....	14,546,551	1.65
1911.....	12,113,867	2.07	1899.....	12,102,017	1.56
1910.....	12,976,362	2.00			

<sup>1</sup> Not available.

TABLE 41.—PRODUCTION OF SHINGLES, BY STATES: 1919.

STATE.	Number of active mills reporting.	Quantity (thousands).	Per cent distribution.	Average value per thousand.
United States.....	1,726	9,192,704	100.0	\$4.19
Washington.....	292	7,095,122	77.2	4.16
Oregon.....	53	530,066	5.8	3.77
Louisiana.....	52	300,784	3.3	4.47
California.....	40	191,831	2.1	4.18
Maine.....	182	188,576	2.0	4.19
Michigan.....	63	144,173	1.6	3.89
Florida.....	71	128,286	1.4	4.41
Georgia.....	142	114,806	1.2	4.54
Arkansas.....	63	98,937	1.1	4.32
Wisconsin.....	58	96,928	1.1	4.13
North Carolina.....	74	92,139	1.0	5.58
Alabama.....	124	82,241	0.7	4.66
Mississippi.....	28	34,002	0.4	4.72
All other states (see Table 42).....	484	114,813	1.2	4.81

SUMMARY.

Table 42 shows in condensed form, for 1919, the number of mills reporting and the production of lumber from the principal hardwoods and softwoods, by kinds of wood and by states; also the production of lath and shingles, by states.

North Dakota did not report the manufacture of lumber, and therefore does not appear in these statistics.

A majority of the mills producing shingles and lath also reported the production of lumber. In the preceding tables for lumber, lath, and shingles, the number of mills reporting each class of product is given; consequently, duplication in the number of mills occurs in the case of those that reported more than one class. In Table 42 this duplication has been eliminated and the actual number of mills reporting one or more of these products is shown. In addition to the 29,534 mills reporting the production of lumber, there were 467 mills which did not saw lumber but reported the production of shingles or lath. Of these, 449 reported shingles and 18 lath.

## FOREST PRODUCTS.

TABLE 42.—ACTIVE SAWMILLS REPORTING, AND REPORTED PRODUCTION OF EACH KIND OF LUMBER, AND OF LATH AND SHINGLES, BY STATES: 1919.

1	STATE.	Number of active mills reporting.	LUMBER SAWED (M FEET B. M.).										
			Aggregate.	SOFTWOODS.									
				Total.	Yellow pine.	Douglas fir.	Western yellow pine.	Hamlock.	White pine.	Spruce.	Cypress.	Red-wood.	Larch.
1	United States....	30,001	34,552,070	27,407,130	13,082,938	5,902,109	1,755,015	1,754,908	1,723,642	979,968	650,212	410,442	388,121
2	Alabama.....	1,953	1,798,740	1,657,873	1,642,588					100	13,776		
3	Arizona.....	20	73,055	73,055		33	73,622						
4	Arkansas.....	1,465	1,772,157	1,093,055	1,049,340						43,335		
5	California.....	173	1,259,303	1,258,953		141,327	444,150	900		4,190		410,442	
6	Colorado.....	133	64,804	64,804		3,118	32,773			16,018			
7	Connecticut.....	231	86,708	15,170				3,940	11,194				
8	Delaware.....	80	27,437	21,318									
9	Florida.....	446	1,137,432	1,125,100	1,004,706						13		
10	Georgia.....	1,815	893,965	813,335	707,217			821	1,857		120,433	43,440	
11	Idaho.....	182	705,388	705,082		32,590	255,320	1,018	234,207	6,017			143,055
12	Illinois.....	252	64,028	2,762	7						2,228		
13	Indiana.....	708	282,487	496				2	5	253			3
14	Iowa.....	85	18,493	302					285				77
15	Kansas.....	6	2,840										
16	Kentucky.....	1,224	512,078	31,610	10,858			10,000	3,575		4,574		
17	Louisiana.....	483	3,163,871	2,778,540	2,470,407						308,130		
18	Maine.....	697	596,110	556,164				85,542	223,843	208,645			177
19	Maryland.....	507	113,362	58,788	53,445			1,582	895	210	649		
20	Massachusetts.....	272	166,841	121,711				12,825	104,200	4,003			
21	Michigan.....	380	875,891	340,216				267,824	57,501	3,417			9,634
22	Minnesota.....	365	699,039	637,206					500,544	29,208			35,765
23	Mississippi.....	1,452	2,390,135	1,997,030	1,980,395						17,291		
24	Missouri.....	798	321,333	87,238	45,299						41,406		18
25	Montana.....	125	287,378	286,518		40,675	108,548	20	371	34,064			101,714
26	Nebraska.....	5	505										
27	Nevada.....	3	20,335	20,335			13,420						
28	New Hampshire.....	355	338,777	299,220				31,404	176,012	75,811			10
29	New Jersey.....	160	36,888	13,230	7,809			354	66				
30	New Mexico.....	50	86,808	86,808		9,060	75,439			1,185			
31	New York.....	1,237	357,764	160,904	94			70,062	49,220	29,841			74
32	North Carolina.....	3,220	1,654,435	1,359,716	1,240,142			48,462	6,532	42,970	17,468		
33	Ohio.....	773	280,076	509	102			355	49	3			
34	Oklahoma.....	153	168,403	144,412	144,412								
35	Oregon.....	544	2,577,403	2,574,597		1,798,492	480,514	52,906	664	166,056			18,968
36	Pennsylvania.....	1,631	630,471	271,752	1,537			225,155	44,213	591			
37	Rhode Island.....	30	11,030	3,022				100	2,799				
38	South Carolina.....	312	621,670	573,001	544,475						27,452		
39	South Dakota.....	41	42,970	42,970			42,970						
40	Tennessee.....	1,858	792,132	170,351	95,979			40,221	12,519		6,924		
41	Texas.....	450	1,379,774	1,332,832	1,330,734						2,097		
42	Utah.....	82	11,917	11,847		909	6,068			2,001			
43	Vermont.....	490	218,479	124,763				31,554	30,344	58,059			23
44	Virginia.....	2,249	1,098,038	665,112	646,834			28,744	10,742	1,004	6,897		
45	Washington.....	798	4,961,220	4,960,026		3,870,631	217,839	280,854	63,214	229,145			63,870
46	West Virginia.....	736	763,103	163,109	5,196			104,582	2,832	50,414			
47	Wisconsin.....	492	1,116,338	594,125				430,757	125,959	10,646			14,733
48	Wyoming.....	54	8,674	8,674		2,335	3,752			915			





DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES  
FOREST PRODUCTS: 1919

PULP-WOOD CONSUMPTION AND  
WOOD-PULP PRODUCTION

Compiled in cooperation with the  
UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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# PULP-WOOD CONSUMPTION AND WOOD-PULP PRODUCTION.

## INTRODUCTION.

In this report are presented statistics of the consumption of wood in the manufacture of wood pulp and the production of wood pulp in the United States during the year 1919 and comparative data for other years.<sup>1</sup>

The pulp and paper industry was particularly active in 1919 on account of the extraordinary demand and the high prices commanded for all grades of paper during the last half of the year.

While the cost of all materials increased, the scarcity and high cost of labor, and the inadequate transportation facilities greatly affected the production of pulp wood. Some mills were undoubtedly forced to draw on their reserve stock of wood to meet the requirements for wood pulp.

The data are shown in 14 tables. Tables 1 to 9, inclusive, show the consumption of pulp wood by kinds of wood, and the production of wood pulp by processes, and by states. Tables 10 to 14, inclusive, give quantities and values of imports and exports of pulp wood, wood pulp, and paper, as such data are essential for the proper presentation of statistics for the industry.

## PULP-WOOD CONSUMPTION.

Comparative consumption of pulp wood (Table 1).—Apparently no great changes in the kinds of wood consumed in this industry have taken place in the past few years, but considerable fluctuations are shown in the quantities reported for some of the species. The consumption of hemlock, domestic poplar, balsam fir, and some of the less important woods decreased in 1919, compared with 1918. However, these decreases were more than offset by increases in other species of wood, notably domestic spruce, imported spruce and poplar, and yellow pine, resulting in a total increase of 227,038 cords of 128 cubic feet, or 4.3 per cent, over the total consumption in 1918.

The items shown for jack pine in 1918 include data for miscellaneous woods not reported separately and locally designated as jack pines but probably include some red gum and various species of yellow pine such as scrub, pitch, and shortleaf among other kinds. For 1919 these woods were distributed and shown

under their proper classification as nearly as could be ascertained.

Cost and consumption of pulp wood (Table 2).—The quantity of pulp wood used shows a large increase for the two decades. Of greater significance, however, is the cost of such wood, the average per cord having increased more than three times during the twenty years, from \$4.95 per cord in 1899 to \$15.95 per cord in 1919.

Number and location of establishments (Table 3).—Maine, New York, and Wisconsin reported 64 per cent of the number of establishments and 58 per cent of the total quantity of wood consumed in the 25 states operating pulp mills in 1919.

A great many woods are being manufactured into pulp, and no doubt the use of woods at present not considered especially suitable will increase from time to time because of the depletion of the supply of the more desirable species. During 1919 spruce, hemlock, poplar, balsam fir, and yellow pine contributed 88.4 per cent of the total for the United States.

Processes of manufacture (Table 4).—The greater part of the wood consumed in this industry in 1919 was utilized in the manufacture of sulphite pulp, 52.3 per cent being converted by this process; 28 per cent was utilized in the production of ground wood pulp; 14.6 per cent in soda pulp; and 5 per cent in sulphate pulp.

The softwoods or conifers, except yellow pine, were used largely in the manufacture of mechanical, sulphite, and sulphate pulp, while the so-called hardwoods were reduced primarily by the soda process. Most of the yellow pine, unlike other conifers, was used in making soda pulp. Gum, Douglas fir, willow, and sycamore are the only woods which are shown as being converted into pulp by the soda process exclusively.

Condition in which purchased, by states (Table 5).—New York and New Hampshire reported the highest average cost per cord of pulp wood, with Maine and Massachusetts showing but slightly lower averages. The high average cost shown for these states was doubtless due, primarily, to the fact that a large portion of the wood used in each was spruce and poplar, which are two of the most valuable woods utilized in the industry, and also to the large percentage of peeled and rossed wood reported. The average value per cord differed considerably, according to the condition in which purchased, the extra labor being, as a rule, reflected in the cost of peeled and rossed wood.

In 1919, 47 per cent of the wood was purchased rough, 46.3 per cent peeled, and 6.7 per cent rossed.

<sup>1</sup> Similar statistics were published by the Forest Service for 1905; by the Bureau of the Census in cooperation with the Forest Service for 1906 to 1911, inclusive; by the Bureau of the Census for 1914; and by the Forest Service in cooperation with the News Print Service Bureau for 1916 to 1918, inclusive.

The condition of the wood used in various mills differed somewhat according to location. In New England and the Eastern states generally, a large part of the wood was purchased peeled or rossed, while in the lake states—Michigan, Minnesota, and Wisconsin—more than 93 per cent of the wood was purchased rough. Rough wood formed 78.8 per cent of the total consumption in the Pacific coast states.

**Condition in which purchased, by kinds of wood (Table 6).**—The greater percentage of domestic spruce, hemlock, balsam fir, larch or tamarack, jack pine, and white fir was purchased rough; while imported spruce, domestic and imported poplar, yellow pine, yellow poplar, and other less important species were generally peeled. Spruce and balsam fir contributed most of the rossed wood, and only comparatively small quantities of other species were reported as purchased in that condition.

#### WOOD-PULP PRODUCTION.

**Consumption of wood and production of wood pulp (Table 7).**—Except for the steadily mounting cost of wood it is not apparent that any startling change has taken place in this industry. The number of establishments reporting has remained fairly constant and the growth in the industry confined largely to the increased output of each plant rather than to the increased number of mills.

The three leading states for all the years shown have been Maine, New York, and Wisconsin, mentioned in the order of their importance for the past three years. In 1909 New York led with Maine in second place and Wisconsin third. These three states consumed 58.2 per cent of the total quantity of pulp wood in 1919, 59 per cent in 1918, 57.9 per cent in 1917, and 60 per cent in 1909.

**Production of wood pulp, by processes (Table 8).**—The form of Table 8 has been changed from the style adopted by the Forest Service for previous years to avoid disclosing the operations of individual establishments. The figures compiled by the Forest Service for 1917 and 1918 did not show separate data for screenings. Otherwise, it is believed the statistics are fairly comparable for these years.

Of the mechanical pulp produced, 18.5 per cent was reported steamed, as compared with 10 per cent in

1918 and 13 per cent in 1917. Bleached sulphite pulp decreased 9 per cent since 1918, but increased 12.8 per cent and 32.3 per cent, respectively, since 1917 and 1914. The table shows that by far the greater per cent of sulphite and sulphate pulp was unbleached, but that more than 90 per cent of the soda pulp was bleached.

**Comparative production of wood pulp (Table 9).**—The total production of wood pulp was greater in 1919 than that reported for any other year for which records are available. The increase from 1918 was 204,091 short tons, or 6.2 per cent. The production, by processes, however, has fluctuated to such an extent that the output for each class has been exceeded in some previous year.

#### IMPORTS AND EXPORTS.

The data shown in Tables 10 to 14, inclusive, were compiled from "The Monthly Summary of Imports and Exports of the United States" published by the Bureau of Foreign and Domestic Commerce and are included in this bulletin for ready reference.

The published figures of quantities of imports and exports were given in long tons for wood pulp and in pounds for paper. For convenience in making comparisons, these data have been reduced to short tons in this bulletin.

Not all of the imported woods are shown separately in the tables giving the consumption of pulp wood. Separate figures are given for only two kinds—imported spruce and imported poplar. Table 10 includes data for other imported woods. The statistics of pulp-wood consumption pertain to the quantity used during the particular year and may include some imported stock of prior years. Consequently the figures for imports and imported woods used are not comparable.

The foreign trade in pulp wood, wood pulp, and paper was brisk during 1919. This was particularly noticeable for paper, the figures for importations and exportations setting new high records. The imports of pulp wood and wood pulp, while not exceeding those of previous years, maintained a high level. The exports of wood pulp exceeded those shown for any previous year by a small margin.

# FOREST PRODUCTS.

TABLE 1.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD, WITH PER CENT DISTRIBUTION: 1919, 1918, 1917, AND 1909.

KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).				PER CENT DISTRIBUTION.			
	1919	1918	1917	1909	1919	1918	1917	1909
Total.....	5,477,832	5,250,794	5,480,075	4,001,607	100.0	100.0	100.0	100.0
Spruce:								
Domestic.....	2,313,419	2,204,143	2,383,966	1,653,249	42.2	42.0	43.5	41.3
Imported.....	873,795	666,164	681,450	768,332	16.0	12.7	12.4	19.2
Hemlock.....	795,154	836,406	775,003	559,657	14.5	15.9	14.1	14.0
Poplar:								
Domestic.....	180,160	210,849	313,955	302,876	3.3	4.0	5.7	7.6
Imported.....	158,220	78,354	92,298	25,622	2.9	1.5	1.7	0.6
Balsam fir.....	288,814	368,117	382,036	95,366	5.3	7.0	7.0	2.4
Yellow pine.....	234,463	139,774	142,094	90,885	4.3	2.5	2.6	2.3
Yellow poplar.....	72,605	61,247	41,155	(*)	1.3	1.2	0.7	.....
Jack pine.....	51,581	152,124	75,382	(*)	0.9	2.9	1.4	.....
Larch or tamarack.....	44,042	52,031	58,732	(*)	0.8	1.0	1.1	.....
White fir.....	31,138	35,119	23,181	37,176	0.6	0.7	0.6	0.9
Juniper.....	30,355	47,143	32,513	(*)	0.6	0.9	0.6	.....
Cottonwood.....	20,830	18,685	32,693	36,898	0.4	0.4	0.6	0.9
Basswood.....	9,799	12,110	3,807	(*)	0.2	0.2	0.1	.....
White pine.....	7,566	10,183	3,562	(*)	0.1	0.2	0.1	.....
Beech, birch, maple, and chestnut.....	183,426	202,930	183,317	(*)	3.2	3.9	3.3	.....
All other species.....	7,384	6,810	8,649	182,569	0.1	0.1	0.2	4.6
Slabs.....	178,081	154,603	233,982	248,977	3.2	2.9	4.3	6.2

1 Forest Service figures.    2 Included in "Domestic poplar" previous to 1916.    3 Included in "Yellow pine."    4 Included in "All other species."

TABLE 2.—QUANTITY AND COST OF PULP WOOD CONSUMED ANNUALLY FOR SPECIFIED YEARS: 1899-1919.

YEAR.	CONSUMPTION (CORDS).	COST (F. O. B. MILL).		YEAR.	CONSUMPTION (CORDS).	COST (F. O. B. MILL).	
		Total.	Average per cord.			Total.	Average per cord.
1919.....	5,477,832	\$87,386,083	\$15.95	1909.....	4,001,607	\$34,477,540	\$8.62
1918.....	5,250,794	73,167,118	13.93	1908.....	3,346,953	28,047,473	8.38
1917.....	5,480,075	60,815,057	11.10	1907.....	3,962,660	32,360,276	8.17
1916.....	5,228,558	45,785,082	8.76	1906.....	3,661,176	26,411,857	7.21
1914.....	4,470,763	39,408,453	8.81	1905.....	3,192,123	17,735,665	5.56
1911.....	4,323,052	.....	.....	1899.....	1,956,310	9,837,516	4.95
1910.....	4,004,306	.....	.....				

1 Not including cost of slabs and other mill waste in Louisiana, Massachusetts, North Carolina, and Virginia.

TABLE 3.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	Number of establishments.	PULP WOOD CONSUMED (CORDS).								
		Total.	Spruce.		Hemlock.	Poplar.		Balsam fir.	Yellow pine.	Yellow poplar.
			Domestic.	Imported.		Domestic.	Imported.			
United States.....	258	5,477,832	2,313,419	873,795	795,154	180,160	158,220	288,814	234,463	72,605
Maine.....	34	1,270,852	893,876	141,164	10,129	113,812	59,124	41,939	.....	.....
New York.....	84	1,055,145	349,976	510,996	55,722	32,178	71,475	16,532	8	.....
Wisconsin.....	47	864,185	244,710	37,660	417,868	2,643	.....	78,772	.....	.....
Pennsylvania.....	14	423,822	44,829	76,824	8,737	18,439	27,194	10,000	86,840	.....
New Hampshire.....	10	375,697	183,235	79,570	1,172	66	2	92,347	.....	.....
Michigan.....	12	207,234	64,393	17,293	42,047	1,555	.....	38,120	.....	.....
Minnesota.....	6	203,862	203,862	.....	.....	.....	.....	.....	.....	.....
Washington.....	4	139,365	38,085	.....	66,598	.....	131	4,413	.....	.....
Vermont.....	9	111,679	102,200	4,305	477	.....	153	.....	.....	.....
West Virginia.....	5	83,590	46,567	.....	18,211	.....	.....	.....	2,700	1,183
Massachusetts.....	4	51,931	35,830	5,983	.....	4,205	272	5,691	.....	.....
California and Oregon.....	6	171,765	31,700	.....	119,517	.....	.....	.....	144,915	71,422
All other states <sup>1</sup> .....	28	519,755	74,650	.....	54,676	7,131	.....	.....	.....	.....

<sup>1</sup> Includes establishments distributed as follows: Delaware, 1; District of Columbia, 1; Georgia, 2; Louisiana, 3; Maryland, 2; Mississippi, 1; North Carolina, 3; Ohio, 2; South Carolina, 1; Tennessee, 1; Texas, 1; and Virginia, 4.

TABLE 3.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY STATES: 1919—Continued.

STATE.	PULP WOOD CONSUMED (CORDS)—continued.									
	Jack pine.	Larch, or tamarack.	White fir.	Gum.	Cottonwood.	Basswood.	White pine.	Beech, birch, maple, and chestnut.	All other.	Slabs and other mill waste.
United States.....	51,581	44,042	31,138	30,355	20,830	9,799	7,506	183,420	7,384	175,061
Maine.....						734	1,771	13,757		4,046
New York.....						4,029	516			19,113
Wisconsin.....	38,370	27,174					114			5,808
Pennsylvania.....				22,631			3,893	69,183		54,852
New Hampshire.....										10,205
Michigan.....	13,205	10,868					860	235		12,068
Minnesota.....										
Washington.....			12,737		15,216				6,699	
Vermont.....										
West Virginia.....							412			14,517
Massachusetts.....										
California and Oregon.....			18,401		164					1,983
All other states <sup>1</sup> .....				7,424	5,420	4,436		100,251	685	49,739

<sup>1</sup> Includes establishments distributed as follows: Delaware, 1; District of Columbia, 1; Georgia, 2; Louisiana, 3; Maryland, 2; Mississippi, 1; North Carolina, 3; Ohio, 3; South Carolina, 1; Tennessee, 1; Texas, 1; and Virginia, 4.

TABLE 4.—PULP-WOOD CONSUMPTION, BY KINDS OF WOOD AND BY PROCESSES OF MANUFACTURE: 1919.

KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).					KIND OF WOOD.	PULP WOOD CONSUMED (CORDS).						
	Total.	Reduced by—					Total.	Reduced by—					
		Mechanical process.	Sulphite process.	Soda process.	Sulphate process.			Mechanical process.	Sulphite process.	Soda process.	Sulphate process.		
Total.....	5,477,832	1,536,447	2,866,603	802,180	272,599	White fir.....	31,138	0,950	21,188				
Spruce:						Gum.....	30,355			30,355			
Domestic.....	2,313,419	1,040,090	1,237,019	1,546	34,764	Cottonwood.....	20,830	164		20,666			
Imported.....	878,795	327,082	540,547	2,659	3,507	Basswood.....	9,799	479	110	9,201			
Hemlock.....	705,154	71,215	607,017	4,221	23,701	White pine.....	7,506	2,807	6	3,893	860		
Poplar:						Beech, birch, maple, and chestnut.....	183,420		235	183,191			
Domestic.....	180,160	10,781	3,087	166,203	89	All other species <sup>1</sup> .....	175,081	7,836	143,011	7,384	8,650	15,878	
Imported.....	168,220	620	402	157,198									
Balsam fir.....	288,814	35,487	210,692	1,100	41,535								
Yellow pine.....	234,403	4,893	2,070	134,491	92,130								
Yellow poplar.....	72,605	1,183		71,422									
Jack pine.....	51,581	23,737			27,844								
Larch, or tamarack.....	44,042	153	10,301		33,688								

<sup>1</sup> Includes Douglas fir, willow, and sycamore.

TABLE 5.—PULP-WOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD OF WOOD CONSUMED, BY CONDITION PURCHASED AND BY STATES: 1919.

STATE.	TOTAL.		ROUGH.		PEELED.		ROSSED.	
	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).
United States.....	5,477,832	\$15.95	2,575,987	\$12.95	2,536,168	\$18.00	365,727	\$22.19
Maine.....	1,279,852	19.37	438,862	18.04	682,855	19.37	158,135	21.14
New York.....	1,055,145	19.43	176,368	16.10	698,335	19.31	180,442	23.35
Wisconsin.....	854,185	11.09	809,804	12.12	44,381	12.27		
Pennsylvania.....	423,822	16.22	110,541	12.09	298,014	17.20	17,267	17.40
New Hampshire.....	375,597	16.43	61,685	15.06	313,837	20.64	75	24.00
Michigan.....	207,234	12.48	171,372	12.30	35,862	11.86		
Minnesota.....	203,862	11.80	203,862	11.80				
Washington.....	139,365	10.00	117,420	10.42	21,945	7.84		
Vermont.....	111,079	15.07	65,918	13.70	41,062	16.31	4,169	25.12
West Virginia.....	83,590	11.62	40,140	9.50	43,450	13.59		
Massachusetts.....	51,081	19.33	10,493	15.77	35,900	19.13	5,609	23.81
California and Oregon.....	171,765	9.62	127,806	9.70	43,950	12.52		
All other states <sup>1</sup> .....	519,755	11.48	241,690	8.50	278,059	14.21		

<sup>1</sup> Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia.

# FOREST PRODUCTS.

**TABLE 6.—PULP-WOOD CONSUMPTION—QUANTITY AND AVERAGE COST PER CORD, BY CONDITION PURCHASED AND BY KINDS OF WOOD: 1919.**

KIND OF WOOD.	TOTAL.		ROUGH.		PEELED.		ROSSSED.	
	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).	Quantity (cords).	Average cost per cord (f. o. b. mill).
Total.....	5,477,832	\$15.95	2,575,937	\$12.95	2,534,168	\$18.09	365,727	\$22.19
Spruce:								
Domestic.....	2,313,419	17.20	1,265,579	15.05	976,040	19.51	71,800	22.25
Imported.....	873,795	20.85	137,690	19.00	459,345	20.40	276,760	22.14
Hemlock.....	795,184	11.02	610,070	10.45	176,869	14.12	2,179	16.22
Poplar:								
Domestic.....	180,100	17.84	25,657	12.42	154,490	17.58	13	15.23
Imported.....	153,220	18.02			153,220	18.16	18	26.44
Balsam fir.....	288,814	15.05	148,110	11.76	128,947	20.02	11,757	24.09
Yellow pine.....	231,403	11.71	87,576	7.19	146,857	14.49		
Yellow poplar.....	72,005	15.02	1,183	9.50	71,422	15.11		
Jack pine.....	51,581	9.88	50,934	9.80	647	14.00		
Larch or tamarack.....	44,042	9.78	43,395	10.08	647	11.00		
White fir.....	31,138	9.40	23,578	9.53	7,560	8.79		
Gum.....	30,355	18.20			30,355	18.20		
Cottonwood.....	20,830	8.42	164	11.18	20,666	9.39		
Basswood.....	9,799	16.13	250	8.00	9,549	16.28		
White pine.....	7,595	14.04	1,894	8.83	5,672	16.00		
Beech, birch, maple, and chestnut.....	183,420	12.11	80,874	8.66	99,352	14.76	3,200	17.00
All other species.....	7,354	7.28			7,354	7.28		
Slabs.....	175,081	9.66	92,977	7.43	82,104	12.04		

\* Includes Douglas fir, willow, and sycamore.

**TABLE 7.—PULP-WOOD CONSUMPTION—NUMBER OF MILLS REPORTING, QUANTITY AND COST OF WOOD CONSUMED, AND QUANTITY OF WOOD PULP PRODUCED, BY STATES: 1909, 1917, 1918, AND 1919.**

STATE.	Year.	Number of mills reporting.	WOOD CONSUMED.			Wood pulp produced (tons).	STATE.	Year.	Number of mills reporting.	WOOD CONSUMED.			Wood pulp produced (tons).
			Quantity (cords).	Cost (f. o. b. mill).						Quantity (cords).	Cost (f. o. b. mill).		
				Average per cord.	Total.						Average per cord.	Total.	
United States....	1919	258	5,477,832	\$15.95	\$87,396,083	3,517,952	Minnesota.....	1919	6	203,862	\$11.86	\$2,418,847	129,560
	1918	250	5,250,794	13.93	73,167,118	3,313,861	".....	1918	6	182,002	11.79	2,145,170	121,444
	1917	246	5,480,075	11.10	60,815,057	3,600,939	".....	1917	6	205,028	11.21	2,319,833	140,353
	1909	253	4,001,607	8.02	34,477,540	2,491,406	".....	1909	7	47,373	7.02	332,548	37,295
	Maine.....	1919	34	1,270,852	19.37	24,795,623	916,784	Washington.....	1919	4	139,365	10.00	1,393,636
".....	1918	33	1,231,090	15.57	19,226,644	872,779	".....	1918	3	108,187	9.02	975,605	68,618
".....	1917	33	1,300,230	11.81	14,813,337	898,798	".....	1917	3	99,585	7.09	708,313	98,576
".....	1909	37	903,962	0.15	8,287,958	603,852	Vermont.....	1919	9	111,679	15.07	1,682,564	85,945
New York.....	1919	84	1,055,145	10.43	20,498,405	811,953	".....	1918	9	99,687	15.47	1,542,652	83,648
".....	1918	75	1,008,742	17.80	17,954,934	749,176	".....	1917	10	109,616	12.33	1,351,525	94,975
".....	1917	79	1,080,550	14.45	15,270,142	798,616	".....	1909	11	70,977	10.18	722,777	50,356
".....	1909	90	921,882	10.45	9,630,575	686,323	West Virginia.....	1919	5	83,590	11.62	971,376	39,195
Wisconsin.....	1919	47	854,185	11.99	10,242,909	506,549	".....	1918	5	109,885	11.22	1,233,252	48,261
".....	1918	40	840,857	9.98	8,551,564	473,590	".....	1917	5	119,918	8.61	1,032,045	54,813
".....	1917	43	805,400	8.79	7,083,173	450,129	".....	1909	5	100,166	5.43	582,985	48,797
".....	1909	37	576,019	7.46	4,294,220	324,509	Massachusetts.....	1919	4	51,081	19.33	1,004,840	32,611
Pennsylvania.....	1919	14	423,822	16.22	6,873,612	215,686	".....	1918	4	45,754	17.53	792,263	30,674
".....	1918	14	383,609	15.48	5,941,382	195,451	".....	1917	4	55,897	12.58	703,369	30,502
".....	1917	14	415,776	11.23	4,609,165	215,060	".....	1909	5	45,809	8.80	403,778	25,804
".....	1909	15	295,038	7.25	2,139,087	135,525	California and Oregon	1919	5	171,765	9.62	1,652,482	123,990
New Hampshire.....	1919	10	375,597	19.43	7,297,625	232,134	".....	1918	6	131,587	8.90	1,171,073	100,036
".....	1918	11	345,272	18.10	6,248,764	229,774	".....	1917	5	162,709	6.03	981,357	120,237
".....	1917	11	413,553	13.78	5,738,883	257,645	".....	1909	5	104,021	7.65	797,267	83,692
".....	1909	11	349,067	9.36	3,276,620	212,599	All other states.....	*1919	23	519,755	11.48	5,969,076	233,791
Michigan.....	1919	12	207,234	12.43	2,586,808	106,194	".....	*1918	26	541,637	9.66	5,239,461	239,174
".....	1918	12	205,516	10.57	2,150,354	101,036	".....	*1917	22	536,593	8.21	4,404,985	243,312
".....	1917	11	187,117	9.30	1,740,580	96,623	".....	*1909	122	444,427	7.19	3,193,855	200,285
".....	1909	8	132,846	6.29	836,861	64,369							

\* Not reported separately in 1909.  
 \* Data for California included with "All other states." Figures shown are for Oregon only.  
 \* Includes Delaware, District of Columbia, Georgia, Louisiana, Maryland, Mississippi, North Carolina, Ohio, South Carolina, Tennessee, Texas, and Virginia.  
 \* Includes California, Delaware, Maryland, North Carolina, Ohio, South Carolina, Texas, Virginia, and Washington.

TABLE 8.—PRODUCTION OF STEAMED, NOT STEAMED, BLEACHED, AND UNBLEACHED WOOD PULP IN THE UNITED STATES, BY PROCESSES: 1909, 1914, 1917, 1918, AND 1919.

PROCESS.	WOOD PULP PRODUCED (TONS).					PROCESS.	WOOD PULP PRODUCED (TONS).				
	1910	1918	1917	1914	1909		1910	1918	1917	1914	1909
Total.....	3,517,952	3,313,861	3,509,939	2,893,150	2,495,523	Sulphates.....	120,378	142,362	84,790	52,641	(1)
Mechanical.....	1,518,829	1,364,504	1,535,953	1,293,661	1,179,206	Unbleached.....	92,375	124,177	69,988	(1)	(1)
Not steamed.....	1,237,191	1,228,274	1,336,268	(1)	(1)	Bleached.....	28,003	18,185	14,801	(1)	(1)
Steamed.....	281,635	136,230	199,685	(1)	(1)	Screenings.....	47,223	(1)	(1)	47,593	(1)
Sulphite.....	1,419,820	1,450,633	1,451,757	1,151,327	1,017,631	Mechanical.....	12,220	(1)	(1)	11,769	(1)
Unbleached.....	910,091	890,657	909,909	765,978	(1)	Chemical.....	35,003	(1)	(1)	35,824	(1)
Bleached.....	509,738	559,976	451,848	385,349	(1)						
Soda.....	411,693	350,362	437,430	347,928	298,626						
Unbleached.....	27,608	29,499	34,509	(1)	(1)						
Bleached.....	384,085	320,863	402,921	(1)	(1)						

(1) Not reported.

TABLE 9.—PRODUCTION OF WOOD PULP, BY PROCESSES, FOR SPECIFIED YEARS: 1899-1919.

YEAR.	WOOD PULP PRODUCED (TONS).					YEAR.	WOOD PULP PRODUCED (TONS).				
	Total.	Mechanical.	Sulphite.	Soda.	Sulphate.		Total.	Mechanical.	Sulphite.	Soda.	Sulphate.
1919.....	3,517,952	1,518,829	1,419,820	411,693	120,378	1910.....	2,533,976	(a)	(a)	(a)	(a)
1918.....	3,313,861	1,364,504	1,456,033	350,362	142,362	1909.....	2,495,523	1,179,206	1,017,631	298,626	(a)
1917.....	3,509,939	1,535,953	1,451,757	437,430	81,799	1908.....	2,118,947	(a)	(a)	(a)	(a)
1916.....	3,435,001	1,508,139	1,466,402	357,021	73,430	1907.....	2,547,879	(a)	(a)	(a)	(a)
1914.....	2,893,150	1,293,661	1,151,327	347,928	52,611	1901.....	1,921,708	908,976	755,022	198,770	(a)
1911.....	2,686,134	(a)	(a)	(a)	(a)	1899.....	1,179,525	586,374	416,037	177,114	(a)

<sup>1</sup> Includes screenings, mechanical 12,220 tons, and chemical, not shown by process, 35,003 tons.<sup>2</sup> Includes screenings, mechanical 11,769 tons, and chemical, not shown by process, 35,824 tons.<sup>3</sup> Not reported separately.

TABLE 10.—IMPORTS OF PULP WOOD: 1910-1919.

CALENDAR YEAR.	TOTAL.			ROUGH.			PEELED.			ROSSED.		
	Quantity (cords).	Value.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.	Quantity (cords).	Per cent of total.	Average value per cord.
Total (10 years).....	10,311,898	\$77,000,470	\$7.53	2,127,761	20.6	\$6.81	6,266,052	60.8	\$7.37	1,918,085	18.6	\$8.84
1919.....	1,047,269	10,458,783	9.99	241,420	23.1	9.59	698,785	66.7	9.70	107,094	10.2	12.75
1918.....	1,370,027	13,362,699	9.75	276,644	20.2	9.11	904,804	70.4	9.63	128,570	9.4	12.04
1917.....	1,031,934	8,563,458	8.30	206,081	20.0	7.20	673,285	65.2	8.07	152,618	14.8	10.73
1916.....	1,097,877	7,202,576	6.56	190,021	17.4	5.98	742,337	67.6	6.43	164,319	15.0	7.90
1915.....	975,974	6,278,948	6.43	258,620	26.5	5.82	544,139	55.8	6.28	173,215	17.7	7.83
1914.....	990,649	6,773,198	6.78	198,414	19.8	6.04	599,209	60.0	6.40	201,930	20.2	8.61
1913.....	1,034,885	7,007,350	6.77	195,900	18.9	5.96	581,756	56.2	6.47	257,223	24.0	8.30
1912.....	933,565	6,227,346	6.67	139,002	14.9	6.08	528,900	56.7	6.06	265,663	28.4	8.23
1911.....	889,257	5,682,716	6.39	191,002	21.5	5.44	478,116	53.2	5.98	225,079	25.3	8.06
1910.....	931,731	6,109,574	6.56	229,691	24.7	5.88	459,681	49.3	6.28	242,359	26.0	7.77

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TABLE 11.—IMPORTS OF WOOD PULP: 1909-1919.

CALENDAR YEAR.	TOTAL.			CHEMICAL, UNBLEACHED.					
	Quantity (short tons).	Value.	Average value per ton.	Unclassified.		Sulphite.		Sulphate.	
				Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.
Total (11 years).....	6,338,231	\$243,653,407	\$38.44	1,941,123	\$83,690,773	913,931	\$65,066,376	433,511	\$30,199,194
1919.....	630,017	37,048,381	58.25			239,952	17,979,170	145,911	9,084,537
1918.....	578,209	31,477,175	54.44			253,454	16,973,540	118,761	7,971,067
1917.....	677,841	41,970,330	61.93			248,173	19,291,410	107,933	9,993,170
1916.....	683,765	26,985,693	39.47	<sup>1</sup> 135,044	<sup>1</sup> 5,255,297	<sup>1</sup> 172,352	<sup>1</sup> 10,822,256	<sup>1</sup> 60,906	<sup>1</sup> 3,150,420
1915.....	508,379	16,907,023	29.75	321,700	10,954,182				
1914.....	675,565	20,411,225	30.21	330,270	11,180,232				
1913.....	511,455	15,935,517	29.43	206,255	9,676,390				
1912.....	510,150	14,903,218	27.59	277,201	8,477,766				
1911.....	532,425	14,394,253	25.59	213,241	6,482,360				
1910.....	506,775	13,296,500	26.24	205,745	0,374,762				
1909.....	337,650	10,315,089	28.06	161,672	5,189,794				

CALENDAR YEAR.	CHEMICAL, BLEACHED.						MECHANICALLY GROUND.	
	Unclassified.		Sulphite.		Sulphate.		Quantity (short tons).	Value.
	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.		
Total (11 years).....	610,740	\$27,708,513	119,599	\$11,745,679	15,141	\$1,102,478	2,304,180	\$44,150,304
1919.....			42,755	4,472,593	5,145	394,765	202,253	5,117,318
1918.....			19,767	1,512,742	3,759	289,790	185,478	4,720,036
1917.....			41,037	4,508,868	1,025	195,014	279,073	7,991,368
1916.....	<sup>1</sup> 20,284	<sup>1</sup> 1,506,034	<sup>1</sup> 19,060	<sup>1</sup> 1,251,976	<sup>1</sup> 4,612	<sup>1</sup> 302,909	262,517	4,686,301
1915.....	72,623	3,363,995					174,056	2,588,846
1914.....	128,038	5,984,060					217,256	3,246,933
1913.....	77,311	3,538,358					167,889	2,670,781
1912.....	77,149	3,374,071					185,904	3,651,381
1911.....	86,502	3,039,945					262,681	4,221,948
1910.....	75,847	3,343,422					224,184	3,578,316
1909.....	62,989	2,858,627					142,989	2,266,668

<sup>1</sup> Jan. 1 to June 30 only.

<sup>1</sup> July 1 to Dec. 31.

TABLE 12.—EXPORTS OF WOOD PULP: 1909-1919.

CALENDAR YEAR.	Quantity (short tons).	VALUE.		CALENDAR YEAR.	Quantity (short tons).	VALUE.	
		Average per ton.	Total.			Average per ton.	Total.
Total (11 years).....	234,088	\$59.83	\$14,059,366	1914.....	12,337	39.27	\$484,477
1919.....	40,067	70.10	3,048,491	1913.....	19,776	37.34	736,451
1918.....	22,324	77.67	1,733,872	1912.....	<sup>1</sup> 14,189	38.27	542,949
1917.....	39,180	88.55	3,459,547	1911.....	<sup>1</sup> 9,494	40.73	386,711
1916.....	40,023	53.01	2,121,745	1910.....	<sup>1</sup> 8,361	41.17	344,251
1915.....	20,294	40.41	820,134	1909.....	<sup>1</sup> 8,953	41.19	368,738

<sup>1</sup> Quantity shown in pounds, reduced in this table to the nearest short tons.

## PULP WOOD AND WOOD PULP.

TABLE 13.—IMPORTS OF PAPER: 1909-1919.

CALENDAR YEAR.	Total value.	NEWSPRINT PAPER.		ALL OTHER PRINTING PAPER.		WRAPPING PAPER.		ALL OTHER PAPER.
		Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Value.
Total (11 years).....	\$316,285,203	3,378,070	\$171,720,345	15,936	\$2,045,310	44,899	\$5,452,284	\$137,067,354
1919.....	53,602,174	627,734	43,674,204	79	58,119	2,401	406,570	9,463,191
1918.....	42,753,730	590,270	35,023,161	91	42,633	3,071	541,866	7,149,120
1917.....	41,734,084	559,113	30,929,628	206	67,931	3,331	450,752	10,279,773
1916.....	28,189,908	468,230	18,527,748	630	119,802	3,552	280,952	9,261,496
1915.....	24,465,604	368,409	14,138,651	1,198	161,703	11,104	626,661	9,538,679
1914.....	27,004,771	315,475	12,189,792	2,876	201,616	20,540	1,150,591	13,996,772
1913.....	24,359,827	219,844	8,549,062	3,379	371,328	.....	735,857	14,703,580
1912.....	18,723,877	85,593	3,262,778	2,799	202,242	.....	846,500	14,322,357
1911.....	18,112,859	55,830	2,090,105	3,688	534,250	.....	400,535	15,081,969
1910.....	18,588,886	59,601	2,182,241	1,900	1,135,086	.....	.....	16,270,959
1909.....	18,149,343	24,911	1,140,885	.....	.....	.....	.....	17,002,458

<sup>1</sup> July 1 to Dec. 31.<sup>2</sup> Newsprint paper and other printing paper.

TABLE 14.—EXPORTS OF PAPER: 1909-1919.

CALENDAR YEAR.	Total value.	NEWSPRINT PAPER.		ALL OTHER PRINTING PAPER.		WRAPPING PAPER.		ALL OTHER PAPER.
		Quantity (short tons).	Value.	Quantity (short tons).	Value.	Quantity (short tons).	Value.	Value.
Total (11 years).....	\$351,338,530	714,833	\$46,659,558	341,520	\$51,113,836	171,770	\$22,540,324	\$231,024,362
1919.....	86,083,063	110,268	10,091,951	70,691	16,169,055	37,458	6,664,462	54,057,595
1918.....	54,179,134	96,730	7,978,296	49,610	8,719,940	29,950	4,828,856	32,652,042
1917.....	46,398,655	93,866	7,580,374	47,274	8,179,868	26,243	3,987,239	26,640,174
1916.....	39,676,879	76,736	4,126,617	62,073	8,069,812	41,837	4,025,388	23,355,062
1915.....	22,264,371	55,161	2,707,026	22,320	2,169,067	18,496	1,667,367	15,720,291
1914.....	20,118,942	60,789	2,983,344	15,130	1,568,990	7,408	522,951	15,038,687
1913.....	21,174,217	43,301	2,105,084	14,059	1,617,285	6,861	560,535	16,890,413
1912.....	21,169,566	55,568	2,690,225	13,452	1,440,992	13,517	1,283,506	16,751,843
1911.....	18,702,151	48,921	2,357,455	13,215	1,278,796	.....	.....	15,085,900
1910.....	17,980,809	24,749	1,198,893	27,663	1,909,061	.....	.....	14,852,855
1909.....	2,832,793	48,740	2,832,793	.....	.....	.....	.....	.....

<sup>1</sup> July 1 to Dec. 31.<sup>2</sup> Newsprint paper and all other printing paper.

DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES  
FOREST PRODUCTS: 1919

TIGHT AND SLACK  
COOPERAGE STOCK

Compiled in cooperation with the  
UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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# TIGHT AND SLACK COOPERAGE STOCK.

## INTRODUCTION.

The terms "tight cooperage stock" and "slack cooperage stock" are applied by the trade to staves, heading, and hoops used by coopers in the manufacture or assembling of hogsheads, barrels, kegs, kits, and firkins. Tight cooperage stock pertains to containers for liquids and slack cooperage stock to containers for solids.

This report presents statistics covering the production of tight staves and heading and slack staves, heading, and hoops in the United States during the year 1919, and comparative data for other specified years.<sup>1</sup>

There were 449 establishments in 26 states that reported the manufacture of tight cooperage stock in 1919, while 745 establishments in 33 states reported the manufacture of slack cooperage stock. Frequently an establishment manufacturing staves also reported heading; but, as a rule, staves, heading, and hoops were not produced by the same concern.

The statistics are presented in 12 general tables. Tables 1 to 7, inclusive, show the production of tight cooperage stock—staves and heading—by classes, by kinds of wood, and by states. Tables 8 to 11, inclusive, give similar statistics for slack cooperage stock—staves, heading, and hoops. Table 12 shows the quantity and value of staves and heading exported for the past 11 years.

## TIGHT COOPERAGE STOCK.

Comparative production of tight staves and heading (Tables 1 and 5).—The total output of the tight cooperage stock industry for 1919 shows an increase of 67,424,000 staves and 3,562,906 sets of heading over the production reported to the Forest Service in 1918, a decrease of 3,373,000 staves and 6,036,078 sets of heading compared with the quantities reported to the Bureau of the Census for 1911, and a decrease of 25,406,000 staves and an increase of 3,582,976 sets of heading when compared with the quantities reported for 1909.

Statistics for tight cooperage stock contain data for staves and heading only. Metal hoops are generally used by the manufacturers of tight containers, while the wooden hoops are, as a rule, used for slack containers.

The stock used in the manufacture of containers for whiskey, wine, beer, and ale is of high grade white

oak. The production of this stock has decreased since the prohibition law went into effect, curtailing the domestic demand. On the other hand, oil and tierce, half barrel and keg, and other stock for non-alcoholic containers show considerable increases during the two decades covered by these statistics.

White oak is the principal wood used for the best grade of tight stock, and no substitute quite as valuable has been found. Chiefly on account of the depletion of the supply of oak timber of late years, the use of Douglas fir, spruce, pine, gum, basswood, etc., for tight barrel and keg stock has increased.

Tight staves produced, by classes and by states (Table 2).—Sawed staves are by far the most important numerically of the four classes, forming 98.6 per cent of the total production. Each of the other classes reported less than 1 per cent of the total; but as the best grade of selected white oak is used in the manufacture of such staves, they are of much greater average value per unit.

The total quantity of tight staves reported for 1919 shows an increase of 23.5 per cent over the production of 1918, but a decrease of 0.9 per cent when compared with 1911 and of 6.7 per cent when compared with 1909.

The greatest annual production of tight staves for which records are available was in 1907. The total for that year was 385,232,000 staves, comprising 325,653,000 sawed, 12,737,000 hewed, 25,082,000 bucked and split, and 21,760,000 beer and ale. In 1907, 9 states reported hewed and bucked and split staves and 12 states beer and ale stock. A comparison of these data with the figures presented in Table 2 shows a falling off in the manufacture of tight staves.

Texas led in the production of hewed staves in 1919, Mississippi in 1918, and Louisiana in 1911 and 1909. Mississippi reported the greatest production of bucked and split staves in 1919, and Arkansas in 1918, 1911, and 1909. In the production of beer and ale staves, Arkansas led in 1919, 1918, and 1911, and Kentucky in 1909.

Sawed tight staves produced, by classes and by states (Table 3).—Twenty-six states reported production of sawed tight staves in 1919, 20 in 1918, 27 in 1911, and 31 in 1909. Of the 26 states in 1919, Arkansas alone reported 31.1 per cent of the total production. This state led in the production of all classes of sawed tight staves in 1918 and in most of them in 1919. In 1919, Oregon, however, reported the largest production of half barrel and keg staves and "All other," and Tennessee the largest production of lead staves.

(3)

<sup>1</sup> Similar statistics were compiled by the Forest Service for 1905, by the Bureau of the Census in cooperation with the Forest Service for the years 1906 to 1911, inclusive, and by the Forest Service in cooperation with the Associated Cooperage Industries of America for 1918.

Sawed tight staves produced, by kinds of wood and by classes (Table 4).—White and red oak were the two principal species of wood used in the manufacture of sawed tight staves in both 1918 and 1919. The use of Douglas fir increased greatly in 1919, this wood contributing 14.3 per cent of the total for that year as against 9 per cent in 1918. In 1919, white oak was used exclusively for bourbon staves, but red oak, Douglas fir, and gum were used extensively in the production of oil and tierce and half barrel and keg staves. Nearly one-half of the pork staves were ash.

Tight heading produced, by classes and by states (Table 6).—Arkansas has led in the production of tight heading for all years for which information is available, contributing 45.6 per cent of the total quantity in 1919. Tennessee ranked second in 1919 and fourth in 1918, producing 14.7 per cent and 11.5 per cent, respectively, of the total output in the United States for those years. In 1918 Louisiana ranked second and Mississippi third.

Tight heading produced, by kinds of wood and by classes (Table 7).—White oak is the principal wood used in the manufacture of tight heading. This wood furnished 37.5 per cent of the total tight heading in 1919 and 40.9 per cent in 1918. Red oak ranked second in importance, contributing 24.1 per cent in 1919 and 26.4 per cent in 1918. Douglas fir, which was first mentioned in the annual statistics for 1910, contributed 9.5 per cent of the total output in 1919 and 4.9 per cent in 1918. This wood was used principally for half barrel and keg and oil and tierce heading.

#### SLACK COOPERAGE STOCK.

Comparative production of slack staves, heading, and hoops (Table 8).—A comparison of the output of slack cooperage stock in 1919 with that in 1918 shows an increase of 111,353,000 staves and 26,630,000 sets of heading, but a decrease of 191,912,000 hoops. All three classes show decreases when compared with the figures for 1911 and 1909. The banner year for slack staves and heading for which data are available was 1909; while the output for wooden hoops was greatest in 1907, the number reported for that year being 490,570,000 pieces.

Many woods can be used for slack stock which would not be valuable for any other purpose; consequently, considerable timber, not suitable for lumber or tight stock, is utilized by this branch of the industry.

In the production of slack staves, red gum has been the leading species since 1907, with pine ranking second. In 1906, elm held first place, furnishing 248,118,000 staves, while only 61,100,000 elm staves were produced in 1919.

In the case of slack heading, pine has held first place for all years for which records are available, furnishing 48.5 per cent of the total output in 1919; while beech held the second place in 1909, red gum ranked second for the last three years shown in Table 8. In 1919, larch, or tamarack, for the first time, was reported

in quantities sufficient to show separately. The decrease in tupelo staves and heading in 1919 as compared with previous years may be partially due to the inclusion of the cut from this wood with that of red gum.

Figures for 1919 show a marked decrease in the output of wooden hoops. This decrease was largely due to conditions affecting timber supply during that year. Elm, because of its tensile qualities, is the wood chiefly used in the manufacture of hoops, but weather conditions adversely affecting logging operations and competition in other lines made it difficult for hoop manufacturers to secure elm timber.

Slack staves produced, by kinds of wood and by states (Table 9).—Arkansas was the leading state in the production of slack staves in 1919, reporting 24.2 per cent of the total. Four other states—Virginia, Missouri, Pennsylvania, and Alabama—each reported more than 50,000,000 staves; and their total output, together with that of Alabama, equaled 703,441,000 staves, or 62.7 per cent of the total for the United States. Statistics for previous years show that Pennsylvania was the leading state in 1906 and 1907; Arkansas in 1908, 1911, and 1918; Michigan in 1909; and Missouri in 1910.

Of the 27 kinds of wood used in the manufacture of slack staves in 1919, red gum furnished 32 per cent and was reported from 11 states; pine furnished 29.2 per cent and was reported from 18 states. Although white oak was reported from 22 states, it furnished only 3.5 per cent of the total. Douglas fir is becoming more important in the manufacture of both tight and slack staves, and an increased production from this kind of wood may be looked for in the future.

Slack heading produced, by kinds of wood and by states (Table 10).—The same kinds of wood are largely used in the manufacture of slack staves and heading, practically the same states reporting the two classes of products. The order of their prominence, however, has been somewhat different.

In 1906 Virginia led in the production of slack heading; Michigan in 1907 to 1909, inclusive; Arkansas in 1911; and Alabama in 1918 and 1919. Alabama, Michigan, and Georgia reported 38,536,000 sets of slack heading, or 44.1 per cent of the total in 1919.

Quantity of hoops produced, by kinds of wood and by states (Table 11).—Although 21 states reported the manufacture of hoops in 1919, Arkansas, Mississippi, Ohio, Tennessee, Indiana, Michigan, and Missouri furnished more than 92 per cent of the total output. These states have been among the leaders in the production of hoops for many years. Ohio led from 1905 to 1918, furnishing as much as 34.6 per cent of the total in 1907. Arkansas ranked first in 1919, contributing 17.9 per cent of the total. This state held fifth place in 1909 and second in 1918. Mississippi ranked seventh in 1906, third in 1918, and second in 1919.

EXPORTS.

The exports of staves and heading are shown in Table 12 for the calendar years 1909 to 1919, inclusive.

The value of staves and heading exported during 1919 was greater than for any previous year. The quantity of staves exported in 1913, however, exceeded the quantity for 1919 by nearly 10,000,000 pieces.

During 1919 the exports to Canada were 26,841,432 staves, valued at \$710,570, an average value of \$26.47 per thousand; to the United Kingdom 13,775,149 staves, valued at \$2,450,085, an average value of \$177.94 per thousand; and to France 10,458,388

staves, valued at \$3,859,664, an average value of \$369.06 per thousand. The exportation to Portugal was 2,337,262 staves and to Netherlands 828,662 staves. The average value of staves exported to Portugal—\$665.55 per thousand—was the highest for any foreign country.

The class of staves exported is not shown in the statistics. From the average values per thousand it may be inferred, however, that a considerable quantity of staves exported to Canada were slack stock and that the bulk of those exported to Europe were high-grade tight staves.

TABLE 1.—QUANTITY OF TIGHT STAVES PRODUCED, BY CLASSES: 1919, 1918, 1911, AND 1909.

CLASS.	TIGHT STAVES PRODUCED (THOUSANDS).				CLASS.	TIGHT STAVES PRODUCED (THOUSANDS).			
	1919	1918	1911	1909		1919	1918	1911	1909
Aggregate.....	353,825	286,401	357,198	379,231	Bucked and split, total.....	1,193	1,391	20,020	15,104
Sawed, total.....	348,812	280,171	312,172	341,259	West Indian.....		741	2,381	2,517
Oil and tierce.....	208,776	191,602	140,519	158,457	Spirit and wine.....	295	176	3,076	1,949
Half barrel and keg.....	68,786	28,150	20,030	19,356	Bourbon.....	210	85	9,860	8,332
Spirit and wine.....	20,211	15,690	36,318	38,933	All other.....	688	389	4,703	2,306
Cut-offs.....	9,557	11,145	(1)	14,239	Beer and ale, total.....	551	544	17,819	16,547
Pork.....	10,246	9,366	11,620	13,457	Beer, barrel.....	260		1,679	1,560
Bourbon.....	5,040	950	24,398	11,991	Beer, half barrel.....	85	185	5,599	6,217
All other.....	20,196	23,259	79,278	84,826	Beer, quarter barrel.....	60	124	7,336	5,399
Hewed, total.....	3,269	4,295	7,187	6,321	Beer, sixth barrel.....			256	1,056
Pipe.....	75	2,296	388	825	Beer, eighth barrel.....		82	2,651	2,058
French claret.....	3,143	1,766	5,228	5,320	Ale, hogshead.....	51	150	177	145
All other.....	51	293	1,571	176	All other.....	75		121	112

<sup>1</sup> Included in the figures for "All other."

TABLE 2.—QUANTITY OF TIGHT STAVES PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	TIGHT STAVES PRODUCED (THOUSANDS).					STATE.	TIGHT STAVES PRODUCED (THOUSANDS).				
	Total.	Sawed.	Hewed.	Bucked and split.	Beer and ale.		Total.	Sawed.	Hewed.	Bucked and split.	Beer and ale.
United States.....	353,825	348,812	3,269	1,193	551	New Hampshire.....	19,359	19,359			
Alabama.....	10,183	15,530	653		295	North Carolina.....	2,764	2,764			
Arkansas.....	109,407	108,551	331	290		Ohio.....	2,825	2,825			
California.....	15,026	15,026				Oregon.....	39,132	39,132			
Florida.....	1,233	1,233	5			Tennessee.....	38,849	38,849	5		
Georgia.....	4,398	4,398			130	Texas.....	4,366	2,891	1,197	152	126
Kentucky.....	21,972	21,842				Virginia.....	7,087	7,087			
Louisiana.....	15,693	14,622	1,071			Washington.....	3,448	3,448			
Mississippi.....	23,791	23,033	12	746		West Virginia.....	6,128	6,128			
Missouri.....	15,497	15,497				Wisconsin.....	4,395	4,395			
						All other states <sup>1</sup> .....	2,232	2,232			

<sup>1</sup> Includes Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, South Carolina, and Vermont.

TABLE 3.—QUANTITY OF SAWED TIGHT STAVES PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	SAWED TIGHT STAVES PRODUCED (THOUSANDS).								
	Total.	Oil and tierce.	Half barrel and keg.	Spirit and wine.	Pork.	Cut-offs.	Bourbon.	Lead.	All other.
United States.....	348,812	208,776	68,786	20,211	10,246	9,557	5,040	728	25,468
Alabama.....	15,530	11,985	1,540	485	618	377		50	250
Arkansas.....	108,551	75,826	11,692	9,362	2,696	4,443	1,710	250	2,572
California.....	15,026	1,378	12,347	436	728				137
Florida.....	1,233	1,227							6
Georgia.....	4,398	3,909	153	306					60
Kentucky.....	21,842	19,843		130		239	1,570		586
Louisiana.....	14,622	12,299	608	707	188	234			48
Mississippi.....	23,033	21,174	993	162	234	422		100	405
Missouri.....	15,497	6,831	5,680	832	1,275	374			7,816
New Hampshire.....	19,359		10,043		1,500				
North Carolina.....	2,764	2,614				15	135		200
Ohio.....	2,825	875				1,750			9,400
Oregon.....	39,132	8,582	20,800		350				1,162
Tennessee.....	38,849	4,346	5,581		1,945	1,037	1,300	328	
Texas.....	2,891	2,329			562				
Virginia.....	7,087	6,920		30	65	63			34
Washington.....	3,448	1,364	40	1,825	185				30
West Virginia.....	6,128	5,943	25	25		105			2,277
Wisconsin.....	4,395	1,718	400			498			485
All other states <sup>1</sup> .....	2,232	800	119	330					

<sup>1</sup> Includes Maine, Massachusetts, Michigan, Oklahoma, Pennsylvania, South Carolina, and Vermont.

## COOPERAGE STOCK.

TABLE 4.—QUANTITY OF SAWED TIGHT STAVES PRODUCED, BY KINDS OF WOOD AND BY CLASSES: 1919.

CLASS.	SAWED TIGHT STAVES PRODUCED (THOUSANDS).												
	Total.	White oak.	Red oak.	Douglas fir.	Gum.	Pine.	Ash.	Spruce.	Birch.	Basswood.	Chestnut oak.	Maple.	All other. <sup>1</sup>
United States.....	348,812	130,298	80,216	49,945	37,763	10,380	7,408	7,284	3,320	2,600	1,700	1,404	1,308
Oil and tierce.....	208,770	87,606	76,730	10,820	27,006	.....	1,220	.....	1,718	.....	1,692	151	918
Half barrel and keg.....	68,786	11,534	5,809	23,788	6,066	10,050	840	6,300	.....	400	.....	.....	.....
Spirit and wine.....	20,211	16,408	1,050	1,825	.....	.....	.....	430	330	.....	.....	.....	162
Cut-offs.....	9,557	4,021	2,153	.....	153	.....	33	.....	.....	2,000	40	115	133
Pork.....	10,246	2,022	410	1,078	69	1,500	4,082	.....	.....	.....	.....	.....	.....
Bourbon.....	5,040	5,040	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	185
Lead.....	728	707	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other.....	25,468	2,000	34	9,494	2,600	7,830	327	449	1,272	200	49	1,138	.....

<sup>1</sup> Includes hemlock, beech, chestnut, cedar, and cypress.

TABLE 5.—QUANTITY OF TIGHT HEADING PRODUCED, BY CLASSES: 1919, 1918, 1911, AND 1909.

CLASS.	TIGHT HEADING PRODUCED (SETS).				CLASS.	TIGHT HEADING PRODUCED (SETS).			
	1919	1918	1911	1909		1919	1918	1911	1909
Aggregate.....	21,274,177	20,711,271	30,310,255	20,001,201	Beer and ale, total.....	8,630	618,017	1,003,703	955,508
Sawed, total.....	21,205,517	20,063,251	28,310,552	19,735,693	Barrel.....	8,630	616,430	311,033	91,050
Oil and tierce.....	13,033,826	13,072,160	11,408,061	9,172,090	Quarter barrel.....	.....	1,198	752,102	( <sup>1</sup> )
Half barrel and keg.....	6,812,430	3,574,863	4,800,100	1,680,001	Half barrel.....	.....	419	621,300	342,735
Spirit and wine.....	1,214,910	892,527	3,250,891	2,297,596	All other.....	.....	.....	306,088	521,723
Pork.....	500,121	.....	309,750	303,319	.....	.....	.....	.....	.....
Bourbon.....	107,170	400,031	4,487,150	1,289,713	.....	.....	.....	.....	.....
All other.....	2,567,081	1,354,673	3,093,979	4,092,062	.....	.....	.....	.....	.....

<sup>1</sup> Included with "All other."

TABLE 6.—QUANTITY OF TIGHT HEADING PRODUCED, BY CLASSES AND BY STATES: 1919.

STATE.	TIGHT HEADING PRODUCED (SETS).								
	Total.	Oil and tierce.	Half barrel and keg.	Spirit and wine.	Cut-offs.	Pork.	Bourbon.	All other sawed.	Beer and ale.
United States.....	21,274,177	13,033,826	6,842,430	1,214,910	1,040,675	500,121	107,170	1,520,406	8,630
Alabama.....	72,800	37,800	.....	25,000	10,000	.....	.....	.....	.....
Arkansas.....	11,064,731	5,800,572	4,180,301	541,333	15,000	343,237	80,000	115,288	.....
California.....	1,164,115	240,408	851,857	17,100	.....	47,100	.....	7,500	.....
Georgia.....	595,606	565,080	.....	20,526	.....	.....	.....	.....	.....
Kentucky.....	106,600	60,600	.....	100,000	.....	.....	.....	.....	.....
Louisiana.....	2,034,021	1,412,679	595,060	100,642	4,800	10,900	.....	.....	.....
Maine.....	345,000	.....	.....	.....	.....	.....	.....	344,000	.....
Massachusetts.....	6,000	.....	.....	.....	.....	.....	.....	6,000	.....
Mississippi.....	1,312,425	1,054,465	150,000	25,000	11,875	10,507	.....	60,408	.....
Missouri.....	30,040	40	30,000	.....	.....	.....	.....	.....	.....
New Hampshire.....	1,527,038	.....	.....	.....	1,005,000	.....	.....	522,038	.....
North Carolina.....	117,000	117,000	.....	.....	.....	.....	.....	.....	.....
Oregon.....	1,507,000	424,000	617,000	.....	.....	20,000	.....	210,000	.....
Tennessee.....	3,578,041	3,067,700	181,278	215,174	.....	55,708	18,170	30,015	.....
Texas.....	142,915	123,700	.....	.....	.....	10,519	.....	.....	8,630
Vermont.....	82,408	.....	.....	.....	.....	.....	.....	82,408	.....
Virginia.....	7,000	5,000	.....	.....	.....	2,000	.....	.....	.....
Washington.....	224,318	43,419	13,005	161,135	.....	.....	.....	2,759	.....
West Virginia.....	15,500	.....	15,500	.....	.....	.....	.....	.....	.....
Wisconsin.....	240,584	78,080	18,408	.....	.....	.....	.....	150,000	.....

TABLE 7.—QUANTITY OF TIGHT HEADING PRODUCED, BY KINDS OF WOOD AND BY CLASSES: 1919.

CLASS.	TIGHT HEADING PRODUCED (SETS).										
	Total.	White oak.	Red oak.	Gum.	Douglas fir.	Pine.	Spruce.	Ash.	Maple.	Birch.	All other. <sup>1</sup>
United States.....	21,274,177	9,105,577	5,849,447	3,378,792	2,290,339	1,881,000	698,171	586,069	278,700	153,086	54,130
Oil and tierce.....	13,033,826	5,524,701	4,022,734	1,538,632	684,580	4,928	.....	40,128	203,700	78,080	27,331
Spirit and wine.....	1,214,910	942,475	70,000	.....	161,135	.....	17,100	24,200	.....	.....	.....
Bourbon.....	107,170	107,170	.....	.....	.....	.....	.....	.....	.....	.....	.....
Half barrel and keg.....	6,842,430	2,315,081	818,838	1,840,100	1,170,699	.....	611,103	68,000	.....	.....	18,498
Pork.....	500,121	81,408	17,000	.....	67,160	.....	.....	334,553	.....	.....	.....
Cut-offs.....	1,040,675	20,800	11,875	.....	.....	1,005,000	.....	.....	.....	.....	.....
All other sawed.....	1,520,406	96,312	.....	.....	212,750	872,038	60,908	111,088	75,000	75,000	8,301
Beer and ale.....	8,630	8,630	.....	.....	.....	.....	.....	.....	.....	.....	.....

<sup>1</sup> Includes hemlock, 19,331 sets; basswood, 18,498 sets; dogwood, 8,301 sets; and chestnut, 8,000 sets.

# FOREST PRODUCTS.

TABLE 8.—QUANTITY OF SLACK STAVES, HEADING, AND HOOPS PRODUCED, BY KINDS OF WOOD: 1919, 1918, 1911, AND 1909.

KIND OF WOOD.	SLACK STAVES PRODUCED (THOUSANDS).				SLACK HEADING PRODUCED (THOUSAND SETS).				SLACK HOOPS PRODUCED (THOUSANDS).			
	1919	1918	1911	1909	1919	1918	1911	1909	1919	1918	1911	1909
Total.....	1,121,324	1,009,971	1,323,968	2,029,548	87,381	60,761	106,407	140,234	140,772	332,684	353,215	375,793
Red gum.....	358,405	495,389	338,582	416,570	13,003	12,656	12,558	16,700	(1)	(1)	(1)	(1)
Pine.....	327,875	109,349	229,220	306,821	42,401	20,735	25,513	38,926	(1)	(1)	(1)	(1)
Elm.....	61,100	83,188	92,614	245,172	1,872	199	2,492	6,535	133,983	330,353	333,297	339,477
Ash.....	53,058	83,022	66,716	71,705	2,318	1,947	7,302	5,245	4,000	54	(1)	(1)
Maple.....	50,446	22,457	66,647	133,255	7,319	2,493	10,794	13,663	(1)	(1)	(1)	(1)
Oak.....	38,920	15,951	50,043	66,675	1,986	620	5,578	1,963	(1)	(1)	(1)	(1)
Beech.....	36,460	47,228	121,727	268,237	4,942	5,930	11,915	19,269	(1)	(1)	(1)	(1)
Chestnut.....	30,303	13,075	71,273	93,290	(1)	360	1,177	876	(1)	(1)	(1)	(1)
Birch.....	35,691	31,758	57,629	78,897	3,490	2,485	4,940	4,328	(1)	(1)	(1)	(1)
Spruce.....	29,683	3,224	70,189	72,219	2,508	538	3,647	1,861	(1)	(1)	(1)	(1)
Douglas fir.....	23,822	13,931	(1)	(1)	841	461	(1)	(1)	(1)	(1)	(1)	(1)
Cottonwood.....	17,511	28,714	37,382	66,260	(1)	1,005	2,535	6,742	(1)	(1)	(1)	(1)
Larch, or tamarack.....	14,505	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tupelo.....	9,206	28,751	37,501	22,500	1,031	2,184	3,891	3,296	(1)	(1)	(1)	(1)
All other.....	28,339	33,934	80,145	188,147	5,070	3,138	14,065	20,830	2,789	2,277	19,918	36,316

<sup>1</sup> Included with "All other."

TABLE 9.—QUANTITY OF SLACK STAVES PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	SLACK STAVES PRODUCED (THOUSANDS).															
	Total.	Red gum.	Pine.	Elm.	Ash.	Maple.	Oak.	Beech.	Chestnut.	Birch.	Spruce.	Douglas fir.	Cottonwood.	Larch, or tamarack.	Tupelo.	All other. <sup>1</sup>
United States.....	1,121,324	358,405	327,875	61,100	53,058	50,446	38,920	36,460	36,303	35,691	29,683	23,822	17,511	14,505	9,206	28,339
Alabama.....	67,298	300	64,746	(1)	(1)	(1)	2,252	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Arkansas.....	271,060	186,243	2	35,181	36,578	802	513	912	(1)	(1)	(1)	4,801	(1)	626	(1)	5,312
Florida.....	19,356	(1)	19,356	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	92
Georgia.....	5,045	(1)	5,553	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	200	(1)	(1)	(1)	1,800
Illinois.....	10,000	7,000	(1)	1,000	(1)	(1)	(1)	(1)	(1)	(1)	(1)	200	(1)	(1)	(1)	(1)
Louisiana.....	23,607	10,275	3,144	2,140	600	(1)	2,891	(1)	(1)	(1)	(1)	2,250	(1)	(1)	(1)	2,307
Maine.....	39,103	(1)	2,995	33	684	1,206	1,465	1,150	20	2,846	22,306	85	(1)	(1)	(1)	6,313
Maryland.....	22,301	(1)	15,187	(1)	(1)	250	4,957	1,997	457	150	18	1,008	(1)	(1)	(1)	37
Massachusetts.....	20,400	(1)	10,574	(1)	(1)	300	1,000	856	150	(1)	(1)	1,008	(1)	(1)	(1)	1,112
Michigan.....	27,862	(1)	3,051	4,472	141	9,050	294	1,663	534	(1)	(1)	(1)	7,605	(1)	(1)	(1)
Minnesota.....	10,109	(1)	(1)	1,589	(1)	(1)	1,589	(1)	(1)	(1)	(1)	(1)	6,900	(1)	(1)	6,031
Mississippi.....	37,595	34,505	1,320	1,234	491	(1)	(1)	(1)	(1)	(1)	(1)	45	(1)	(1)	(1)	(1)
Missouri.....	101,355	71,521	(1)	10,182	12,516	1,400	3,415	(1)	(1)	(1)	(1)	1,459	(1)	862	(1)	(1)
New Hampshire.....	18,896	(1)	18,218	(1)	(1)	15	400	203	20	20	(1)	(1)	(1)	(1)	(1)	20
New York.....	41,483	(1)	183	159	3	18,419	153	6,129	16,225	(1)	(1)	(1)	(1)	(1)	(1)	192
North Carolina.....	40,020	23,968	8,962	(1)	(1)	(1)	20	(1)	2	(1)	(1)	(1)	(1)	(1)	(1)	8
Ohio.....	5,135	(1)	(1)	150	1,620	(1)	1,787	1,570	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Oregon.....	13,860	(1)	(1)	(1)	(1)	(1)	64	(1)	(1)	3,125	10,660	(1)	(1)	(1)	(1)	(1)
Pennsylvania.....	70,493	(1)	1,784	300	25	15,395	3,023	23,945	12,094	13,592	100	(1)	(1)	(1)	(1)	235
South Carolina.....	7,522	7,522	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Tennessee.....	30,732	11,561	(1)	2,501	100	1,601	5,071	43	83	(1)	(1)	7,493	(1)	(1)	(1)	2,279
Virginia.....	108,235	5,450	165,932	(1)	(1)	(1)	2,856	(1)	18,152	(1)	(1)	(1)	(1)	50	(1)	785
West Virginia.....	6,683	(1)	92	100	300	107	4,804	200	680	100	(1)	(1)	(1)	(1)	(1)	300
Wisconsin.....	6,861	(1)	(1)	1,089	(1)	1,639	501	(1)	2,224	(1)	(1)	(1)	(1)	(1)	(1)	408
All other states <sup>2</sup> .....	25,033	51	776	970	(1)	262	1,865	52	2,615	4,113	13,162	60	(1)	(1)	(1)	1,107

<sup>1</sup> Includes hemlock, basswood, sycamore, hackberry, yellow poplar, cypress, walnut, redwood, cedar, butternut, willow, hickory, and balsam fir.  
<sup>2</sup> Includes California, Delaware, Indiana, Iowa, Kentucky, New Jersey, Texas, Vermont, and Washington.

## COOPERAGE STOCK.

TABLE 10.—QUANTITY OF SLACK HEADING PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	SLACK HEADING PRODUCED (THOUSAND SETS).													
	Total.	Pine.	Red gum.	Maple.	Beech.	Birch.	Bass-wood.	Spruce.	Ash.	Oak.	Elm.	Tupelo.	Douglas fr.	All other. <sup>1</sup>
United States.....	87,381	42,401	13,003	7,319	4,942	3,400	3,078	2,508	2,318	1,086	1,872	1,031	841	2,592
Alabama.....	23,063	22,217	1,613											
Arkansas.....	3,719	100	2,038						544	100	18	133	220	
Georgia.....	6,309	6,304												9
Kentucky.....	976		801							85				5
Louisiana.....	1,559	101	626									360		26
Maine.....	2,749	846		73	21	244	3	1,318	100	11				412
Massachusetts.....	1,500	1,404		17	52	62								133
Michigan.....	8,264	130		4,674	1,494	1,087	295		4	20	302			25
Minnesota.....	2,415	175		200		20	1,061		44	227	227			249
Missouri.....	4,360		3,853						507					461
New Hampshire.....	2,637	2,612		2				1						
New York.....	2,493	106	44	826	478	613	71	17	20	56	97			22
North Carolina.....	4,837	2,652	1,876									309		126
Ohio.....	1,160				6				500	538	116			
Oregon.....	804							160		3			701	
Pennsylvania.....	2,848	16		856	1,308	487	16		16	16			16	41
South Carolina.....	993	993												
Tennessee.....	1,352		823	32	113	40			20	277	10			28
Virginia.....	4,851	3,827	441							153		9		424
West Virginia.....	1,485	4	2		1,400					3				76
Wisconsin.....	4,936			515		305	1,546		486	305	990			189
All other states <sup>2</sup> .....	3,138	944	226	124	10	2	82	1,012	50	93	96		124	366

<sup>1</sup> Includes chestnut, cottonwood, hemlock, sycamore, yellow poplar, cypress, redwood, tamarack, willow, cherry, and balsam fir.

<sup>2</sup> Includes California, Florida, Illinois, Indiana, Maryland, Mississippi, Texas, Vermont, and Washington.

TABLE 11.—QUANTITY OF HOOPS PRODUCED, BY KINDS OF WOOD AND BY STATES: 1919.

STATE.	HOOPS PRODUCED (THOUSANDS).		
	Total.	Elm.	All other.
United States.....	140,772	133,983	6,789
Arkansas.....	25,167	24,000	561
Indiana.....	14,347	14,347	
Michigan.....	11,226	11,226	
Mississippi.....	23,853	23,853	
Missouri.....	11,138	11,138	
Ohio.....	23,593	23,593	
Tennessee.....	20,223	20,199	24
All other states <sup>1</sup> .....	11,225	5,021	6,204

<sup>1</sup> Includes Alabama, Florida, Illinois, Kentucky, Maine, Massachusetts, Minnesota, New Hampshire, New York, North Carolina, Oregon, Pennsylvania, Virginia, and Wisconsin.

TABLE 12.—EXPORTS OF STAVES AND HEADING: 1909-1919.

[Compiled from "Monthly Summary of Foreign Commerce of the United States," Bureau of Foreign and Domestic Commerce, Department of Commerce.]

YEAR.	STAVES.			HEADING.
	Quantity.	Total value.	Average value per thousand.	Value.
1919.....	81,657,792	\$13,160,377	\$161.16	\$591,021
1918.....	53,373,526	3,095,332	67.55	593,564
1917.....	60,065,092	3,688,681	61.47	294,248
1916.....	58,058,719	3,595,132	61.41	289,846
1915.....	51,325,017	3,339,026	65.06	367,469
1914.....	54,048,147	3,835,176	70.96	246,594
1913.....	91,369,115	7,231,934	79.15	325,043
1912.....	73,069,719	6,144,806	83.14	340,867
1911.....	60,097,987	6,065,915	101.86	421,225
1910.....	58,651,374	5,207,466	88.32	291,292
1909.....	47,554,880	4,478,532	94.18	155,572

DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES  
FOREST PRODUCTS: 1919

# TURPENTINE AND ROSIN

Prepared under the supervision of EUGENE F. HARTLEY, Chief Statistician for Manufactures

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## EXPLANATION OF TERMS.

**Scope of census.**—Census statistics of manufactures are compiled primarily for the purpose of showing the absolute and relative magnitude of the different branches of industry covered and their growth or decline. Incidentally, the effort is made to present data throwing light upon character of ownership, size of establishments, and similar subjects. When use is made of the statistics for these purposes it is imperative that due attention be given to their limitations, particularly in connection with any attempt to derive from them figures purporting to show average wages, cost of production, or profits.

The census did not cover establishments which were idle during the entire year or for which products were valued at less than \$500, or the manufacturing done in educational, eleemosynary, and penal institutions.

**Period covered.**—The returns relate to the calendar year 1910, or the business year which corresponded most nearly to that calendar year, and cover a year's operations, except for establishments which began or discontinued business during the year.

**The establishment.**—As a rule, the term "establishment" represents a single plant or factory, but in some cases it represents two or more plants which were operated under a common ownership or for which one set of books of account was kept. If, however, the plants constituting an establishment as thus defined were not all located within the same city, county, or state, separate reports were secured in order that the figures for each plant might be included in the statistics for the city, county, or state in which it was located. In some instances separate reports were secured for different industries carried on in the same establishment.

**Classification by industries.**—The establishments were assigned to the several classes of industries according to their products of chief value. The products reported for a given industry may thus, on the one hand, include minor products different from those covered by the class designation, and, on the other hand, may not represent the total product covered by this designation, because some products of this class may be made in establishments in which it is not the product of chief value.

**Influence of increased prices.**—In comparing figures for cost of materials, value of products, and value added by manufacture in 1910 with the corresponding figures for earlier censuses, account should be taken of the general increase in the prices of commodities during recent years. To the extent to which this factor has been influential the figures fail to afford an exact measure of the increase in the volume of business.

**Persons engaged in the industry.**—The following general classes of persons engaged in the manufacturing industries were distinguished: (1) Proprietors and firm members, (2) salaried officers of corporations, (3) superintendents and managers, (4) clerks (including other subordinate salaried employees), and (5) wage earners.

The number of persons engaged in each industry, segregated by sex, and, in the case of wage earners, also by age (whether under 16 or 16 and over), was reported for a single representative day. The 15th of December was selected as representing for most industries normal conditions of employment, but where this date did not portray such conditions, an earlier date was requested.

In the case of employees other than wage earners the number thus reported for the representative date has been treated as equivalent to the average for the year, since the number of employees of this class does not ordinarily vary much from month to month. In the case of wage earners the average has been obtained in the manner explained in the next paragraph.

In addition to the more detailed report by sex and age of the number of wage earners on the representative date, a report was obtained of the number employed on the 15th of each month, by sex, without distinction of age. From these figures the average number of wage earners for the year has been calculated by dividing the sum of the numbers reported for the several months by 12. The importance of the industry as an employer of labor is believed to be more accurately measured by this average than by the number employed at any one time or on a given day.

The number of wage earners reported for the representative day, though given in certain tables for each separate industry, is not totaled for all industries combined, because, in view of the variations of date, such a total is not believed to be significant. It would involve more or less duplication of persons working in different industries at different times, would not represent the total number employed in all industries at any one time, and would give an undue weight to seasonal industries as compared with industries in continual operation.

In order to determine as nearly as possible the age distribution of the average number of wage earners for an industry, the per cent distribution by age of the wage earners for December 15, or the nearest representative day, has been calculated from the actual numbers reported for that date. The percentages thus obtained have been applied to the average number of wage earners for the year to determine the average numbers 16 years and over, and under 16, employed.

**Salaries and wages.**—Under these heads are given the total payments during the year for salaries and wages, respectively. The Census Bureau has not undertaken to calculate the average annual earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages, and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calcu-

late accurately even so simple an average as this, since the number of wage earners fluctuates from month to month in every industry, and in some cases to a very great extent. The Census Bureau's figures for wage earners, as already explained, are averages based on the number employed on the 15th of each month, and while representing the number according to the pay rolls to whom wages were paid on that date, no doubt represent a larger number than would be required to perform the work in any industry if all were continuously employed during the year.

**Prevailing hours of labor.**—No attempt was made to ascertain the number of wage earners working a given number of hours per week. The inquiry called merely for the prevailing practice followed in each establishment. Occasional variations in hours in an establishment from one part of the year to another were disregarded, and no attention was paid to the fact that a few wage earners might have hours differing from those of the majority. All the wage earners of each establishment are therefore counted in the class within which the establishment itself falls. In most establishments, however, practically all the wage earners work the same number of hours, so that the figures give a substantially correct representation of the hours of labor.

**Capital (amount actually invested).**—The instructions on the schedule for securing data relating to capital were as follows:

"The answer should show the total amount of capital, both owned and borrowed, on the last day of the business year reported. All the items of fixed and live capital may be taken at the amounts carried on the books. If land or buildings are rented, that fact should be stated and no value given. If a part of the land or buildings is owned, the remainder being rented, that fact should be so stated and only the value of the owned property given. Do not include securities and loans representing investments in other enterprises."

These instructions were identical with those employed at the census of 1914 and 1900. The data compiled in respect to capital, however, at both censuses, as well as at all preceding censuses of manufactures, have been so defective as to be of little value except as indicating general conditions. In fact, it has been repeatedly recommended by the census authorities that this inquiry be omitted from the schedule. While there are some establishments whose accounting systems are such that an accurate return for capital could be made, this is not true of the great majority, and the figures therefore do not show the actual amount of capital invested.

**Materials.**—The statistics as to cost of materials relate to the materials used during the year, which may be more or less than the materials purchased during the year. The term "materials" covers fuel, rent of power and heat, mill supplies, and containers, as well as materials which form a constituent part of the product.

**Rent and taxes.**—The taxes include certain Federal taxes and state, county, and local taxes. Under "Federal taxes" there are included the internal revenue tax on manufactures (tobacco, beverages, etc.), excise taxes when included in values reported for products, corporation capital stock tax, and corporation income tax, but not the income tax for individuals and partners.

**Value of products.**—The amounts given under this heading represent the selling value or price at the factory of all products manufactured during the year, which may differ from the value of the products sold.

**Value added by manufacture.**—The value of products is not always a satisfactory measure of either the absolute or the relative importance of a given industry, because only a part of this value is actually created by the manufacturing processes carried on in the industry itself. Another part, and often by far the larger one, represents the value of the materials used. For many purposes, therefore, the best measure of the importance of an industry, from a manufacturing standpoint, is the value created by the manufacturing operations carried on within the industry. This value is calculated by deducting the cost of the materials used from the value of the products. The figure thus obtained is termed in the census reports "value added by manufacture."

**Cost of manufacture and profits.**—The census data do not show the entire cost of manufacture, and consequently can not be used for the calculation of profits. No account has been taken of depreciation or interest, rent of offices and buildings other than factory or works, insurance, ordinary repairs, advertising, and other sundry expenses.

**Primary horsepower.**—This item represents the total primary power equipment of the manufacturing establishments plus the amount of power, principally electric, rented from other concerns. It does not cover the power of electric motors taking their current from dynamos driven by primary power machines operated by the same establishment, because the inclusion of such power would obviously result in duplication. The figures for primary horsepower represent the rated capacity of the engines, motors, etc., and not the amount of power in actual daily use.

**Fuel.**—Statistics of the quantity of fuel used are shown only for anthracite and bituminous coal, coke, fuel oils, gasoline and other volatile oils, and gas, and represent the quantity used during the year. As only the principal kinds of fuel are shown, comparison as to the total cost of all fuel is impracticable.

# TURPENTINE AND ROSIN.

## GENERAL STATISTICS.

**General character of the industry.**—This report presents statistics for establishments engaged in the production of spirits of turpentine and rosin by the distillation of the semifluid exudation of certain species of pine trees. The crude materials are variously designated as crude gum, crude turpentine, and resin. The free-flowing sap which collects in the cup or box at the base of the tree is called "dip" and the gum or resin adhering to the chipped surface of the tree is called "scrape."

The crude gum is derived principally from the long-leaf pine (*Pinus palustris*) which is indigenous to the coastal area extending from North Carolina to eastern Texas; and to a less extent from the Cuban or slash pine (*Pinus caribaea*) and the loblolly pine (*Pinus taeda*). A relatively small quantity of turpentine is obtained from pine wood by destructive distillation or by the steam process. The establishments, 22 in number in 1919, which produced turpentine in this manner are treated as belonging to the wood-distillation industry, and the statistics therefor are not included in this report except in connection with the presentation of data for total production (see note 1, Table 12).

Crude turpentine was collected by the early settlers of the eastern coast of Virginia and the Carolinas by practically the same method of boxing the trees as is employed to-day. They also extracted tar and pitch from resinous pine wood by means of sod-covered kilns or pits. The products were extensively used in the construction of wooden sailing vessels and boats and for that reason they were called "naval stores." The use of that term has been extended to cover not only tar and pitch, which are wood-distillation products, but also spirits of turpentine and rosin. In recent years the demand for tar and pitch in the ship and boat building industry has diminished owing to the displacement of wood by iron and steel. Spirits of turpentine and rosin are now used chiefly in the manufacture of such commodities as paint, oil, varnish, soap, paper, rubber, oilcloth, linoleum, sealing wax, fly paper, printing ink, lubricating compounds, medicinal preparations, and in cloth printing.

**Importance and growth of the industry.**—Table 1 summarizes the more important data relative to the industry for the censuses from 1879 to 1919 and gives the percentages of increase or decrease for each census.

The large increases, from 1914 to 1919, in salaries and wages, in cost of materials used, and in value of products are due to the general rise in the cost of labor and commodities during and following the World War and do not, therefore, fairly measure the growth of the industry during that period. The addition of the

Federal income tax since 1914 accounts for the large increase in "Rent and taxes."

The relatively small cost of materials, 26.3 per cent in 1919, as compared with the value of products is due to the fact that in this industry the greater part of the cost of the materials is the compensation of the employees engaged in gathering the crude gum and is reported under the head of "Wages."

The decrease of 14.6 per cent in the number of establishments during the five-year period 1914-1919 may be attributed primarily to the diminution in the supply of pine timber in turpentine-producing states.

The increase of 152.7 per cent in the value of products for 1919 compared with 1914 was due to the increase in unit values, as the production of spirits of turpentine decreased 9,287,140 gallons and that of rosin decreased 851,755 barrels.

**States ranked by value of products.**—Table 2 presents statistics pertaining to wage earners and products for the eight states producing naval stores, arranged according to their rank in production.

In 1849 the industry was largely confined to the eastern part of North Carolina, which continued to be the leading state until 1879, when it was outranked by South Carolina. In 1889 and 1899 Georgia led in value of products, but at the last four censuses Florida has ranked first and Georgia second, while North Carolina has dropped from first place during the early period of the industry in the United States to eighth place, producing in 1919 only about three-tenths of 1 per cent of the total output.

**Persons engaged in the industry.**—Table 3 shows, for 1919, 1914, and 1909, the number of persons engaged in the industry distributed by class and sex, the average number of wage earners also being shown separately for persons 16 years of age and over and persons under 16 years of age. The age classification of the average number of wage earners is an estimate obtained by the method described in "Explanation of Terms." The classification by sex for 1919 was reported separately but for 1914 and 1909 was obtained in the same manner as the distribution by age.

**Wage earners, by months.**—The statistics for wage earners in Table 4 show the steadiness of employment, or the reverse, in accordance with the industrial conditions as they existed during the several census years. The turpentine and rosin industry is seasonal, the work being distributed as follows: Cutting boxes and hanging cups during the winter months, chipping and dipping in the spring and summer, and scraping and raking in the early fall. The largest number of wage earners is employed during the chipping and dipping season, the maximum force being required at

that time to gather the gum, to operate the distilleries, and to handle the products.

**Prevailing hours of labor.**—In the turpentine and rosin industry, the piece-work system of wage payments is in general use, and the woodsmen usually work irregular hours. The classification of employees on the basis of prevailing hours of labor is therefore of doubtful significance. Figures presented in Table 5, however, indicate a tendency toward the shortening of the working-day of the wage earner.

**Size of establishments, by average number of wage earners.**—The number of establishments which did not employ any wage earners increased during the two census periods shown in Table 6. This fact may be due to the stimulus caused by the great increases in the unit values of the products which were urgently needed during the war, the increased prices undoubtedly being sufficiently attractive for a number of small operators to engage in the industry. The only other group showing an increase from 1914 to 1919 is the group employing from 101 to 250 wage earners.

**Size of establishments, by value of products.**—The tendency of the industry to become concentrated in large establishments, or the reverse, is indicated by the statistics shown in Table 7.

Of the 105 establishments which for 1919 reported products valued at more than \$100,000 each, 42 were located in Florida, 22 in Louisiana, 21 in Mississippi, 8 in Alabama, 7 in Georgia, and 5 in Texas.

**Character of ownership.**—The tendency toward the corporate form of ownership in this industry is shown in Table 8 by the increased proportion of the total number of wage earners and the total value of products reported by this group. Nearly one-half of the number of establishments reported in 1919, however, were operated by individuals, and individual ownership predominated in all but three states—Louisiana, Mississippi, and Texas.

**Number and horsepower of types of prime movers.**—Little mechanical power is required for this industry, many establishments reporting none. The total primary power, as shown in Table 9, decreased 1,651 horsepower, or 40 per cent, from 1909 to 1914, and 165 horsepower, or 6.7 per cent, from 1914 to 1919. Practically all of the power is derived from steam engines and internal-combustion engines. The use of the latter type is increasing.

**Fuel consumed.**—The principal fuel used in this industry is wood, chiefly waste timber, the quantity of which was not reported.

TABLE 1.—COMPARATIVE SUMMARY: 1919, 1914, 1909, 1904, 1899, 1889, AND 1879.

	NUMBER OR AMOUNT.							PER CENT OF INCREASE. <sup>1</sup>					
	1919	1914	1909	1904	1899	1889	1879	1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
Number of establishments.....	1,191	1,394	1,585	1,287	1,503	670	508	-14.6	-12.1	23.2	-14.4	124.3	31.9
Persons engaged.....	31,003	38,294	44,524	37,526	45,945	(?)	(?)	-18.8	-14.0	18.6	-18.3	.....	.....
Proprietors and firm members..	1,400	1,021	2,507	1,907	2,102	(?)	(?)	-0.9	-30.0	28.5	-8.9	.....	.....
Salaried employees.....	1,506	1,850	2,410	2,147	1,889	(?)	(?)	-15.6	-24.1	13.0	13.7	.....	.....
Wage earners (av. number)....	28,007	34,817	39,511	33,382	41,804	15,260	10,535	-19.4	-11.0	18.4	-20.3	174.2	44.9
Primary horsepower.....	2,303	2,478	4,120	1,175	800	(?)	(?)	-7.1	-40.0	251.4	35.7	.....	.....
Capital.....	\$33,595,980	\$20,744,872	\$12,400,978	\$6,061,185	\$11,847,495	\$1,002,375	\$1,800,300	61.9	67.3	78.1	-41.2	101.6	117.7
Salaries and wages.....	\$19,215,737	\$10,017,385	\$11,018,750	\$9,534,022	\$9,172,177	\$2,033,491	\$1,023,001	91.8	-0.1	15.6	4.0	212.7	80.7
Salaries.....	\$2,242,856	\$1,434,415	\$1,055,301	\$1,152,222	\$778,694	(?)	(?)	56.4	-13.3	43.7	48.0	.....	.....
Wages.....	\$16,972,881	\$8,582,970	\$9,963,449	\$8,381,800	\$8,393,483	(?)	(?)	97.8	-8.3	11.7	-0.1	188.8	.....
Paid for contract work.....	\$425,407	\$532,143	\$958,000	\$51,843	\$100,309	.....	.....	-20.1	-10.1	1,100.2	-67.7	.....	.....
Rent and taxes.....	\$854,328	\$102,027	\$103,017	\$402,502	\$490,032	.....	.....	344.0	-0.8	200.8	-37.3	.....	.....
Cost of materials.....	\$13,029,888	\$5,535,561	\$4,010,838	\$3,774,037	\$6,180,492	\$2,874,604	\$2,324,637	151.0	12.7	30.1	-30.0	115.2	23.7
Value of products.....	\$53,051,294	\$20,090,101	\$25,205,017	\$23,937,024	\$20,344,888	\$8,077,370	\$5,870,083	152.7	-17.0	5.7	17.7	151.9	37.4
Value added by manufacture <sup>2</sup> .....	\$39,121,406	\$15,454,030	\$20,384,179	\$20,162,387	\$14,158,396	\$5,202,686	\$3,652,346	153.1	-24.2	1.1	42.4	172.1	46.5
Quantity of principal products:													
Spirits of turpentine (gals.)....	17,093,841	26,980,061	28,988,054	30,087,051	37,733,500	(?)	(?)	-34.4	-6.9	-5.5	-18.7	.....	.....
Rosin (bbls. of 280 lbs. gross)...	2,033,322	2,885,077	3,203,837	3,808,347	4,348,004	(?)	(?)	-20.5	-11.6	-7.0	-10.3	.....	.....

<sup>1</sup> A minus sign (-) denotes decrease.

<sup>2</sup> Figures not available.

<sup>3</sup> The capital reported for 1899 included timber land, valued at \$5,622,040.

<sup>4</sup> Exclusive of internal revenue.

<sup>5</sup> Value of products less cost of materials.

TABLE 2.—STATES RANKED BY VALUE OF PRODUCTS: 1919.

STATE.	Number of establishments.	WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.		
		Average number.	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Rank.
United States.....	1,191	28,007	100.0	.....	\$53,051	100.0	.....	\$39,121	100.0	.....
Florida.....	452	11,748	41.9	1	21,509	40.5	1	15,050	40.0	1
Georgia.....	441	7,078	25.2	2	10,875	20.5	2	7,930	20.3	2
Alabama.....	174	3,014	10.7	3	5,802	11.1	3	4,108	10.5	5
Louisiana.....	33	2,004	0.3	4	5,591	10.5	4	4,211	10.8	4
Mississippi.....	45	2,495	8.9	5	5,548	10.5	5	4,257	10.9	3
Texas.....	10	1,018	3.6	6	3,301	6.2	6	2,783	7.1	6
South Carolina.....	22	84	0.3	7	103	0.3	7	105	0.3	7
North Carolina.....	14	26	0.1	8	107	0.3	8	77	0.2	8

# TURPENTINE AND ROSIN.

TABLE 3.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.

CLASS.	Cen- sus year.	Total.	Male.	Fe- male.	PER CENT OF TOTAL.		CLASS.	Cen- sus year.	Total.	Male.	Fe- male.	PER CENT OF TOTAL.	
					Male.	Fe- male.						Male.	Fe- male.
All classes.....	1919 1914 1909	31,093 38,294 44,524	30,954 38,198 44,426	139 96 98	99.6 99.7 99.8	0.4 0.3 0.2	Clerks and other subordinate salaried employees.	1919 1914 1909	219 551 1,300	214 543 1,296	5 8 4	97.7 98.5 99.7	2.3 1.5 0.3
Proprietors and officials.....	1919 1914 1909	2,807 2,920 3,713	2,779 2,906 3,683	28 20 30	99.0 99.3 99.2	1.0 0.7 0.8	Wage earners (average number).....	1919 1914 1909	28,067 34,817 39,511	27,961 34,749 39,447	106 68 64	99.6 99.8 99.8	0.4 0.2 0.2
Proprietors and firm members.....	1919 1914 1909	1,460 1,621 2,567	1,433 1,601 2,537	27 20 30	98.2 98.8 98.8	1.8 1.2 1.2	16 years of age and over.....	1919 1914 1909	27,694 34,358 38,918	27,590 34,253 38,861	104 65 57	99.6 99.8 99.9	0.4 0.2 0.1
Salaried officers of corporations.....	1919 1914 1909	149 117 86	149 117 86	..... ..... .....	100.0 100.0 100.0	..... ..... .....	Under 16 years of age.....	1919 1914 1909	373 459 593	371 456 586	2 3 7	99.5 99.3 98.8	0.5 0.7 1.2
Superintendents and managers.....	1919 1914 1909	1,198 1,188 1,060	1,197 1,188 1,060	1 ..... .....	99.9 100.0 100.0	0.1 ..... .....							

TABLE 4.—WAGE EARNERS, BY MONTHS AND BY STATES: 1919.

[The month of maximum employment for each State is indicated by bold-faced figures and that of minimum employment by *italic* figures.]

STATE.	Average number em- ployed during year.	NUMBER EMPLOYED ON THE 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY.												Per cent mini- mum is of maxi- mum.
		Janu- ary.	Febru- ary.	March.	April.	May.	June.	July.	August.	Sep- tember.	Octo- ber.	Novem- ber.	Decem- ber.	
		United States: Total..... 1919..	28,037	<i>25,018</i>	20,756	27,548	28,537	28,723	<b>28,802</b>	28,664	28,692	28,319	28,617	
Males..... 1919..	27,961	<i>25,806</i>	20,609	27,391	28,406	28,652	<b>28,729</b>	28,569	28,602	28,227	28,515	28,184	27,842	89.8
Females..... 1919..	106	112	147	157	131	71	73	95	90	92	102	112	90	45.2
Total..... 1914..	31,817	<i>33,717</i>	33,984	35,759	37,408	37,787	<b>37,647</b>	37,579	35,747	31,031	32,608	31,150	30,407	80.5
Total..... 1909..	39,511	<i>37,112</i>	37,340	39,489	39,974	40,378	<b>40,555</b>	40,634	40,583	40,378	39,749	39,597	39,343	91.3
Alabama.....	3,014	<i>2,784</i>	2,814	2,911	3,097	3,036	<b>3,092</b>	3,121	3,149	3,113	3,096	3,035	2,980	88.4
Florida.....	11,748	<i>10,532</i>	11,613	11,322	11,918	12,038	<b>12,161</b>	12,068	12,147	11,878	12,182	11,963	11,784	87.0
Georgia.....	7,078	<i>6,765</i>	6,952	6,999	7,069	7,091	<b>7,250</b>	7,160	7,109	7,176	7,211	7,235	7,235	93.3
Louisiana.....	2,604	<i>2,334</i>	2,401	2,536	2,583	2,805	<b>2,522</b>	2,639	2,655	2,637	2,795	2,806	2,835	78.8
Mississippi.....	2,495	<i>2,201</i>	2,248	2,486	2,446	2,623	<b>2,572</b>	2,682	2,685	2,662	2,495	2,451	2,189	81.5
North Carolina.....	26	<i>20</i>	20	21	22	27	<b>28</b>	28	28	29	29	30	30	66.7
South Carolina.....	81	<i>71</i>	76	82	82	81	<b>84</b>	91	80	86	87	87	92	77.2
Texas.....	1,018	<i>1,203</i>	1,232	1,269	1,280	1,244	<b>1,252</b>	785	779	775	777	773	787	60.4

TABLE 5.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, BY STATES: 1919 AND 1914.

STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							
			44 and under.	Between 44 and 48.	48 <sup>1</sup>	Between 48 and 54.	54	Between 54 and 60.	60	Over 60.
			United States.....	1919	28,067	7,333	445	3,706	2,509	4,430
	1914	34,817	( <sup>2</sup> )	( <sup>2</sup> )	13,680	2,770	728	780	15,995	864
	1909	39,511	( <sup>2</sup> )	( <sup>2</sup> )	14,786	2,647	1,022	280	19,607	1,169
Alabama.....	1919	3,014	543	128	121	611	325	66	1,220	.....
	1914	3,411	( <sup>2</sup> )	( <sup>2</sup> )	2,027	144	152	40	919	129
Florida.....	1919	11,748	3,870	275	1,122	1,304	2,171	130	2,858	18
	1914	15,466	( <sup>2</sup> )	( <sup>2</sup> )	5,883	1,155	476	255	7,294	403
Georgia.....	1919	7,078	1,341	28	2,220	528	892	294	1,763	12
	1914	9,118	( <sup>2</sup> )	( <sup>2</sup> )	2,953	368	90	419	4,700	88
Louisiana.....	1919	2,604	1,306	.....	221	30	290	.....	757	.....
	1914	2,472	( <sup>2</sup> )	( <sup>2</sup> )	1,187	170	.....	.....	948	167
Mississippi.....	1919	2,495	49	14	4	19	259	.....	2,150	.....
	1914	5,275	( <sup>2</sup> )	( <sup>2</sup> )	1,494	405	9	50	1,240	77
North Carolina.....	1919	26	1	.....	.....	3	.....	18	4	.....
	1914	45	( <sup>2</sup> )	( <sup>2</sup> )	9	8	1	.....	27	.....
South Carolina.....	1919	84	2	.....	2	14	.....	.....	61	5
	1914	221	( <sup>2</sup> )	( <sup>2</sup> )	127	20	.....	16	58	.....
Texas.....	1919	1,018	224	.....	16	.....	493	.....	285	.....
	1914	809	.....	.....	.....	.....	.....	.....	809	.....

<sup>1</sup> Includes 48 and under for 1914 and 1909.

<sup>2</sup> Corresponding figures not available.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, BY STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—												
	Estab-lish-ments.	Wage earners (average number).	No wage earners.	1 to 5 wage earners, inclusive.		6 to 20 wage earners, inclusive.		21 to 50 wage earners, inclusive.		51 to 100 wage earners, inclusive.		101 to 250 wage earners, inclusive.		251 to 500 wage earners, inclusive.	
			Estab-lish-ments.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.	Estab-lish-ments.	Wage earners.
United States. 1919	1,191	28,067	37	179	522	551	7,171	330	10,446	60	4,325	30	4,305	4	1,288
1914	1,394	34,817	21	218	629	631	8,569	419	13,400	77	5,561	20	3,283	8	1,296
Alabama.....	174	3,014	4	37	111	82	914	43	1,346	7	506	1	137		
Florida.....	452	11,748	7	41	144	197	2,744	172	5,384	22	1,501	11	1,446		
Georgia.....	441	7,078	18	72	225	250	3,220	90	2,808	9	575	2	250	2	529
Louisiana.....	33	2,604				2	34	11	389	11	814	9	1,397		
Mississippi.....	45	2,495	1	7	12	11	145	9	342	10	859	6	861	1	276
North Carolina.....	14	26	3	10	14	1	12								
South Carolina.....	22	84	4	12	10	6	68								
Texas.....	10	1,018				2	34		177	1	70	1	244	1	493

<sup>1</sup> Includes one establishment with 739 wage earners.

TABLE 7.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS: 1919, 1914, AND 1909.

VALUE OF PRODUCT.	NUMBER OF ESTABLISHMENTS.			AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.		
	1919	1914	1909	1919	1914	1909	1919	1914	1909	1919	1914	1909
All classes.....	1,191	1,394	1,585	28,067	34,817	39,511	\$53,051,204	\$20,900,101	\$25,205,017	\$30,121,406	\$15,454,030	\$20,384,179
Less than \$5,000.....	101	357	249	165	2,370	1,409	279,601	1,076,043	775,812	184,600	730,684	530,019
\$5,000 to \$20,000.....	395	800	971	3,484	15,987	19,261	5,050,453	8,494,419	11,210,577	3,594,627	6,152,208	8,933,708
\$20,000 to \$100,000.....	590	217	355	14,398	11,232	16,412	24,865,020	7,888,112	11,618,484	18,160,209	5,933,019	9,594,332
\$100,000 and over.....	105	20	10	9,850	5,228	2,429	22,855,530	3,531,617	1,684,144	17,172,700	2,637,750	1,325,520
PER CENT DISTRIBUTION.												
All classes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than \$5,000.....	8.6	25.6	15.7	0.6	6.8	3.6	0.5	5.1	3.1	0.5	4.7	2.6
\$5,000 to \$20,000.....	33.2	57.4	61.3	13.1	45.9	48.7	9.5	40.5	44.3	9.2	39.8	43.8
\$20,000 to \$100,000.....	49.5	15.6	22.4	51.2	32.3	41.5	46.9	37.0	45.0	40.4	38.4	47.1
\$100,000 and over.....	8.8	1.4	0.6	35.1	15.0	6.1	43.1	16.8	6.7	43.9	17.1	6.5

TABLE 8.—CHARACTER OF OWNERSHIP, BY STATES: 1919 AND 1914.

STATE.	Cen-sus year.	NUMBER OF ESTABLISHMENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.						VALUE OF PRODUCTS.							
		Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Total.	In establishments owned by—			Per cent of total.			Total.	Of establishments owned by—			Per cent of total.		
						Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.		Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.	Indi-vid-u-als.	Cor-pora-tions.	All oth-ers.
United States...	1910	547	247	307	28,067	7,738	11,552	8,777	27.6	41.2	31.3	\$53,051,204	\$12,011,421	\$24,040,448	\$15,409,425	23.8	47.0	29.2
	1914	552	221	621	34,817	8,571	12,812	13,434	24.6	36.8	38.6	20,900,101	4,731,386	8,402,030	7,850,760	22.5	40.0	37.4
	1909	599	196	790	39,511	11,022	9,130	10,359	27.0	23.1	40.0	25,205,017	6,000,127	6,144,050	12,184,834	27.5	24.3	48.2
Alabama.....	1910	80	29	50	3,014	957	1,151	909	31.8	38.2	30.1	5,802,492	1,795,930	2,353,317	1,743,236	30.5	39.9	29.6
	1914	74	24	62	3,411	1,175	881	1,355	34.4	25.8	39.7	2,047,132	612,881	540,710	857,541	31.4	26.7	41.9
Florida.....	1910	175	107	170	11,748	3,502	4,257	3,080	29.8	36.2	34.0	21,408,553	5,692,083	8,428,667	7,387,809	26.5	39.2	34.3
	1914	153	100	155	15,406	3,425	5,292	6,749	22.1	34.2	43.6	9,573,083	1,001,374	3,588,009	4,023,700	20.5	37.5	42.0
Georgia.....	1910	244	46	151	7,078	3,064	774	3,240	43.3	10.9	45.8	10,874,714	4,600,055	1,320,380	4,944,670	42.4	12.1	45.5
	1914	254	42	266	9,118	3,449	835	4,834	37.8	9.2	53.0	4,607,590	1,604,120	417,636	2,465,828	36.8	9.7	53.5
Louisiana.....	1910	2	30	1	2,604	64	2,319	221	2.5	89.1	8.5	5,591,250	67,710	5,040,448	483,122	1.2	90.1	8.6
	1914	4	17	6	2,472	80	2,203	99	3.2	92.8	4.0	1,888,391	69,600	1,709,584	82,708	3.6	92.0	4.5
Mississippi.....	1910	6	25	14	2,495	76	2,047	372	3.0	82.0	14.9	5,547,813	105,307	4,517,064	834,842	3.5	81.4	15.0
	1914	16	30	15	3,275	233	2,770	272	7.1	84.6	8.3	1,097,130	155,842	1,552,057	280,240	7.8	77.7	14.5
North Carolina.....	1910	12	1	1	26	23	2	1	88.5	7.7	3.8	167,410	133,810	16,200	17,400	79.9	9.7	10.4
	1914	25	2	8	45	29		16	64.4		35.6	146,081	107,034	138,747	73.0		26.4	
South Carolina.....	1910	19		3	84	52		32	61.9		38.1	168,383	116,008		51,475	69.4		30.6
	1914	26	2	7	221	180		41	81.4		18.6	151,801	103,130		148,671	67.0		32.1
Texas.....	1910		1		1,018		1,002	16		98.4	1.6	3,300,640		3,209,772	30,868		99.1	0.9
	1914		4	2	809		2,809			100.0		608,374		2,608,374			100.0	

<sup>1</sup> Includes the group "Corporations."

<sup>2</sup> Includes the group "All others."

TABLE 9.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919, 1914, AND 1909.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.					
	1919	1914	1909	Amount.			Per cent distribution.		
				1919	1914	1909	1919	1914	1909
Primary power, total.....	543	522	1,214	2,303	2,478	4,129	100.0	100.0	100.0
Owned.....	538	522	1,214	2,257	2,478	4,122	98.0	100.0	99.8
Steam.....	253	325	1,152	1,343	1,669	3,577	55.3	67.4	93.9
Engines.....	243	(1)	(1)	1,206	(1)	(1)	56.3	.....	.....
Turbines.....	10	(1)	(1)	47	(1)	(1)	2.0	.....	.....
Internal-combustion engines.....	269	193	58	884	789	231	38.4	31.8	5.6
Water wheels, turbines, and motors.....	16	4	4	30	20	14	1.3	0.5	0.3
Rented.....	5	.....	.....	46	.....	7	2.0	.....	0.2
Electric.....	5	.....	.....	19	.....	.....	0.8	.....	.....
Other.....	.....	.....	.....	27	.....	7	1.2	.....	0.2
Electric.....	5	1	.....	19	2	.....	100.0	100.0	.....
Rented.....	5	.....	.....	19	.....	.....	100.0	.....	.....
Generated by establishments reporting.....	.....	1	.....	.....	2	.....	.....	100.0	.....

<sup>1</sup> Not reported separately.

SPECIAL STATISTICS.

Crops worked and system employed.—The unit of measure in turpentine-woods operations is the "crop" which consists of about 10,500 boxes or cups. In extracting the resin from the trees, two systems are in use—the box system and the cup and gutter system. The essential feature of the box system is a cavity or "box" cut into the base of the tree to receive the resin which is called "dip." This operation is followed by "chipping," which consists of reexposing the cambium layer by removing directly above the box a strip of bark and sapwood about three-fourths of an inch wide and from one-half to 1 inch deep. The chipping is done with a "hack," a specially constructed tool, from either side diagonally downward terminating in the center and immediately above the box. The exposed surface of the tree the width of the box is termed a "face." A season's chipping extends the face of the tree upward a distance of about 24 inches. The dip is removed from the box by the use of a flat trowel-shaped instrument called a "dipper."

The cup system, now most generally used, differs from the box system principally in the substitution of a clay or metal cup for the cut-in box, the gum being conveyed into the cup by means of metal gutters inserted into the tree and leading diagonally downward. The chipping of the tree begins above the cup, and continues upward in the same manner as when the box system is used. After the chipping has extended up the tree for a distance, usually at the end of the first or second season, the cup and gutters may be raised, thus avoiding much waste by evaporation. Its chief advantage over the box system is that it causes less damage to the vitality and stability of the trees and secures a greater yield and a better quality of crude gum.

The gum which hardens on the face of the tree is called "scrape" and this is gathered at the end of the

season by the use of a "scraper." Because of evaporation, "scrape" produces less spirits and more rosin than dip.

The extent to which the box system is being supplanted by the cup system is strikingly brought out by the figures showing per cent distribution for the three censuses. The box system for gathering crude gum predominated in all of the eight turpentine-producing states in 1909. In 1919 four of the states used the cup system exclusively, and this was the more important method employed in all of the states for gathering crude gum.

TABLE 10.—NUMBER OF CROPS WORKED, AND SYSTEM EMPLOYED, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	NUMBER OF CROPS WORKED.			PER CENT DISTRIBUTION.	
		Total.	By cup system.	By box system.	Cup system.	Box system.
United States.....	1919	12,141	10,503	1,638	86.5	13.5
	1914	18,166	11,813	6,353	65.0	35.0
	1909	20,158	2,383	17,775	11.8	88.2
Alabama.....	1919	1,385	1,353	32	97.7	2.3
	1914	1,693	1,410	283	83.3	16.7
	1909	1,945	309	1,636	15.9	84.1
Florida.....	1919	5,410	4,594	816	84.9	15.1
	1914	8,950	5,627	3,323	62.9	37.1
	1909	9,923	1,114	8,809	11.2	88.8
Georgia.....	1919	3,165	2,396	769	75.7	24.3
	1914	5,044	2,548	2,496	50.5	49.5
	1909	6,178	457	5,721	7.4	92.6
Louisiana.....	1919	893	893	.....	100.0	.....
	1914	943	903	40	95.8	4.2
	1909	633	278	355	43.9	56.1
Mississippi.....	1919	822	822	.....	100.0	.....
	1914	1,138	1,121	17	98.5	1.5
	1909	1,033	182	851	17.3	82.7
North Carolina.....	1919	9	9	.....	100.0	.....
	1914	39	.....	39	.....	100.0
	1909	62	2	60	3.2	96.8
South Carolina.....	1919	50	29	21	58.0	42.0
	1914	125	16	109	12.8	87.2
	1909	271	.....	271	.....	100.0
Texas.....	1919	407	407	.....	100.0	.....
	1914	234	188	46	80.3	19.7
	1909	93	41	52	44.1	55.9

Number and age of crops worked.—Timber which is undergoing its first period of working is called "first boxing" or "round" timber. After it has been worked four or five years it may be allowed to rest for about the same length of time or until the wounds heal and its vitality is restored so that it is in a

condition to furnish another yield of gum. Timber, which after such a rest is again worked, is called "back-boxed" timber, the expression which refers to the cutting of new boxes having originated when the box system was the only one employed.

TABLE 11.—NUMBER OF CROPS, YEARS WORKED, AND SYSTEM EMPLOYED, BY STATES: 1919.

STATE.	Aggregate.	NUMBER OF CROPS.															
		Total.				Virgin (first year).				Yearling (second year).				Pulling (third and subsequent years).			
		First boxing.		Back boxing.		First boxing.		Back boxing.		First boxing.		Back boxing.		First boxing.		Back boxing.	
		Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.	Cup system.	Box system.
United States.....	12,141	6,086	831	4,417	807	1,673	146	911	120	1,307	150	843	140	3,106	535	2,603	541
Alabama.....	1,385	1,081	20	272	3	163	3	51	.....	253	12	71	1	605	14	150	2
Florida.....	5,410	2,480	637	2,105	170	401	105	392	27	447	105	373	20	1,581	427	1,340	123
Georgia.....	3,105	507	151	1,880	618	152	36	428	90	141	31	305	106	214	84	1,000	413
Louisiana.....	893	893	.....	.....	.....	500	.....	.....	.....	140	.....	.....	.....	175	.....	.....	.....
Mississippi.....	822	753	.....	69	.....	255	.....	20	.....	242	.....	15	.....	256	.....	34	.....
North Carolina.....	9	1	.....	8	.....	.....	.....	2	.....	.....	.....	.....	.....	1	.....	6	.....
South Carolina.....	50	14	14	15	7	.....	2	3	.....	2	2	4	4	12	10	8	3
Texas.....	407	348	.....	59	.....	73	.....	15	.....	73	.....	15	.....	202	.....	20	.....

Materials used and products.—Statistics showing the number of establishments, materials used, and products are shown in Table 12 for 1919, 1914, and 1909.

The number of establishments, quantity of materials used, and quantity of products all show decreases for 1919 compared with the figures for the two previous censuses.

TABLE 12.—MATERIALS USED AND PRODUCTS, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	MATERIALS USED (CRUDE GUM DISTILLED).						Total value.	PRODUCTS. <sup>1</sup>				
			Dip (barrels 500 pounds).			Scrape (barrels 300 pounds).				Spirits of turpentine.		Rosin.		Dross and other products.
			Total.	Gathered by establishments reporting. <sup>2</sup>	Purchased. <sup>3</sup>	Total.	Gathered by establishments reporting. <sup>2</sup>	Purchased. <sup>3</sup>		Gallons.	Value.	Barrels (280 pounds).	Value.	
United States.....	1919	1,191	1,432,214	1,411,005	21,209	514,184	595,575	8,609	\$53,051,204	17,003,841	\$20,067,228	2,033,322	\$31,881,000	\$503,06
	1914	1,394	2,194,532	2,131,580	50,952	902,477	878,793	23,714	29,000,191	26,080,081	10,500,527	2,885,077	10,320,410	151,244
	1909	1,585	2,376,908	2,248,724	128,179	1,069,789	1,047,849	51,040	25,295,017	28,988,954	12,051,228	3,203,857	12,576,721	64,068
Alabama.....	1919	174	162,562	158,162	4,400	57,159	55,591	1,655	5,802,492	2,037,005	2,443,040	215,784	3,406,431	42,121
	1914	160	227,695	221,100	6,580	110,620	107,427	3,202	8,000,191	2,721,777	1,054,133	294,820	985,099	8,033
	1909	175	230,270	227,474	8,805	121,280	110,767	4,510	2,471,693	2,840,242	1,253,737	300,793	1,214,054	4,208
Florida.....	1919	452	567,105	562,417	4,688	207,782	207,246	536	21,508,553	6,092,489	8,238,251	868,628	13,088,444	181,858
	1914	508	975,535	970,712	4,823	427,484	425,370	2,114	29,000,191	12,303,232	4,823,079	1,310,367	4,695,591	56,843
	1909	593	1,112,105	1,110,407	1,788	519,924	513,098	826	11,037,518	15,806,785	5,817,478	1,555,749	6,057,524	32,516
Georgia.....	1919	441	348,280	345,312	2,968	95,197	94,636	561	10,874,714	3,997,310	4,544,679	410,090	6,228,507	101,528
	1914	562	512,390	512,032	3,358	178,761	175,472	3,290	4,007,590	6,228,041	2,480,145	621,309	2,068,218	50,227
	1909	592	656,730	647,348	9,382	295,225	291,065	4,220	6,038,957	8,058,752	3,559,065	904,103	3,371,670	10,816
Louisiana.....	1919	33	143,668	143,668	.....	64,790	64,790	.....	5,591,280	1,885,231	2,070,871	201,608	3,404,585	115,833
	1914	27	175,908	175,172	730	74,181	73,871	310	1,853,391	2,252,118	835,509	269,274	1,006,270	16,069
	1909	23	90,224	90,224	.....	43,164	43,164	.....	1,173,848	1,231,254	592,611	130,486	573,306	7,901
Mississippi.....	1919	45	138,495	134,123	4,372	51,384	51,800	2,404	5,517,813	1,749,812	2,011,800	207,114	3,498,130	37,811
	1914	61	207,876	198,289	9,587	73,333	69,951	3,382	1,997,139	2,385,051	935,747	275,205	1,081,049	19,352
	1909	64	127,102	122,020	4,470	62,253	60,000	2,193	1,474,629	1,588,786	732,334	192,598	739,799	2,496
North Carolina.....	1919	14	4,790	730	4,060	3,215	367	2,848	107,410	67,150	76,055	7,260	83,735	7,020
	1914	35	24,964	5,033	10,931	10,037	2,023	3,901	146,081	182,378	70,843	23,641	70,804	5,984
	1909	79	101,188	10,295	90,295	36,237	3,901	32,336	673,051	781,197	369,587	83,070	304,232	183
South Carolina.....	1919	22	4,678	3,957	721	2,054	1,539	515	108,383	58,440	68,212	6,340	99,048	523
	1914	35	20,034	11,176	8,858	7,697	4,294	3,403	151,801	201,221	78,233	16,169	72,377	1,191
	1909	56	37,479	24,052	13,427	21,000	14,054	7,816	400,286	400,180	505,517	51,401	199,273	1,496
Texas.....	1919	10	62,636	62,636	.....	29,606	29,606	.....	3,390,640	926,404	1,213,354	107,462	2,071,514	15,772
	1914	6	50,160	50,160	.....	20,355	20,355	.....	608,374	647,160	256,238	71,355	349,165	2,971
	1909	3	15,700	15,700	.....	5,800	5,800	.....	217,826	220,752	95,909	27,777	116,857	5,000

<sup>1</sup> In addition, in 1919, 1,534,333 gallons of turpentine, valued at \$1,207,739, and 234,030 barrels of rosin, valued at \$2,742,552, were reported by establishments engaged in the distillation of wood. In 1914, 92,401 gallons of turpentine, valued at \$36,617, and 8,027 barrels of rosin, valued at \$11,731, were reported by establishments assigned to lumber and timber products, and 575,537 gallons of turpentine, valued at \$191,183, and 51,825 barrels of rosin, valued at \$198,105, were reported by establishments engaged in the distillation of wood. In 1909, 18,310 gallons of turpentine, valued at \$7,482, were reported by lumber manufacturers, and 706,868 gallons, valued at \$249,526, by wood-distillation establishments.

<sup>2</sup> For 1914 and 1909 the total quantity of dip and scrape purchased was reported but not separately, and the figures for those years are segregated on the basis of the total consumption of each kind.



FOREST PRODUCTS: 1919.

TABLE 15.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.										WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Capital.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.				
					Male.	Female.	Average number.	Number 15th day of—			Male.	Female.	Male.	Female.			
								Maximum month.	Minimum month.								
United States .....	1,101	31,093	1,460	1,347	214	5	28,067	Ja 28,802	Ja 25,018	29,601	20,103	103	303	2	\$33,595,986		
Alabama .....	171	3,379	213	136	15	1	3,014	Aug 3,140	Jan 2,781	3,137	3,107	11	18	1	1,992,060		
Florida .....	452	13,016	572	635	88	3	11,748	Oct 12,162	Jan 10,582	12,451	12,114	34	302	1	15,525,531		
Georgia .....	441	7,071	500	286	17	.....	7,078	Jy 7,250	Jan 6,763	7,445	7,422	11	12	.....	3,693,142		
Louisiana .....	33	2,771	4	124	38	1	2,601	Dec 2,835	Jan 2,234	2,815	2,798	17	.....	.....	6,271,338		
Mississippi .....	45	2,656	39	90	26	.....	2,495	Aug 2,685	Dec 2,180	2,608	2,540	30	38	.....	3,471,334		
North Carolina .....	14	41	14	1	.....	.....	26	Nov 30	Jan 20	30	30	.....	.....	.....	49,620		
South Carolina .....	22	111	25	2	.....	.....	84	Dec 92	Jan 71	96	96	.....	.....	.....	109,451		
Texas .....	10	1,118	3	67	30	.....	1,018	Apr 1,280	Nov 773	1,019	996	.....	23	.....	2,483,180		

STATE.	EXPENSES.								Value of products.	Value added by manufacture.	POWER.					
	Salaries and wages.			For contract work.	Rent and taxes.		For materials.				Total.	Primary horsepower.				
	Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.				Owned.				
												Steam engines.	Steam turbines.	Internal combustion engines.	Water power. <sup>1</sup>	
United States .....	\$2,006,441	\$236,415	\$10,972,881	\$125,407	\$34,800	\$810,459	\$13,654,976	\$271,912	\$53,051,294	\$30,121,406	2,303	1,290	47	884	30	46
Alabama .....	213,834	20,125	2,062,190	37,200	450	42,282	1,745,001	38,382	5,892,302	4,108,200	329	183	4	111	28	3
Florida .....	773,283	92,924	6,832,835	199,837	19,654	325,539	5,755,424	103,400	21,508,553	15,640,729	904	570	10	304	.....	20
Georgia .....	341,358	15,880	4,177,639	110,517	13,389	64,450	2,856,868	88,386	10,874,714	7,930,460	783	457	33	288	2	3
Louisiana .....	432,591	51,537	1,627,637	20,175	600	128,916	1,364,167	40,521	5,591,280	4,210,001	131	10	.....	101	.....	20
Mississippi .....	131,001	31,970	1,574,063	51,063	770	148,908	1,276,570	13,822	5,547,813	4,257,412	78	20	.....	58	.....	.....
North Carolina .....	1,200	.....	15,000	125	.....	776	80,784	3,024	167,440	77,002	4	2	.....	2	.....	.....
South Carolina .....	1,500	.....	47,534	550	.....	1,175	61,725	1,408	168,383	105,250	10	.....	.....	10	.....	.....
Texas .....	101,674	23,970	695,923	.....	.....	107,344	508,528	9,369	3,300,640	2,782,743	64	54	.....	10	.....	.....

<sup>1</sup> Same number reported for one other month.

<sup>2</sup> Includes water wheels and turbines (irrespective of ownership of water supply).

<sup>3</sup> Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

DEPARTMENT OF COMMERCE  
BUREAU OF THE CENSUS  
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES  
FOREST PRODUCTS: 1919

FOREST PRODUCTS CONSUMED  
IN THE  
MANUFACTURE OF VENEERS, DYESTUFFS AND EXTRACTS  
AND IN  
TANNING AND WOOD DISTILLATION

Compiled in cooperation with the  
UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE

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# FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF VENEERS, DYESTUFFS AND EXTRACTS, AND IN TANNING AND WOOD DISTILLATION.

## INTRODUCTION.

This report presents statistics for 1919 of the quantity and cost of wood and other forest products consumed in the manufacture of veneers, dyestuffs and extracts, and in wood distillation; also of the quantity and cost of vegetable tanning materials consumed in the United States during that year. Comparable statistics for other specified years are shown for all industries except for the manufacture of dyestuffs and extracts. Figures showing the consumption of forest products in that industry for previous years are not available, as detailed data pertaining thereto have not been collected heretofore by this bureau.

WOOD AND OTHER FOREST PRODUCTS USED FOR—	Cost.
Veneers.....	\$25, 104, 164
Dyestuffs and extracts.....	12, 133, 799
Tanning materials.....	12, 027, 687
Wood distillation.....	9, 559, 046

The relative importance of these industries in the use of crude forest products is shown in the preceding

statement, which gives the cost at the place of consumption of materials used during 1919.

With the exception of veneers, these industries do not make a very great drain on the forest resources of the United States. The wood used in distillation in a large measure comes from slashings, mill waste, and timber not suitable for lumber. Various barks are used to a great extent for tanning materials, and considerable quantities of forest-grown products used in the industry are imported, as are also large quantities of those used for dyestuffs and extracts.

The statistics of capital, employees, wages, and other items for these industries are shown in census reports under separate classifications. The manufacture of veneers is classed with the lumber and timber group, and those for wood distillation and for dyestuffs and extracts are presented in connection with the chemical group, while such data for the tanning industry are included with those for the leather group.

## WOOD CONSUMED IN THE MANUFACTURE OF VENEERS.

In the early history of the industry, veneers were manufactured from the best grades of cabinet woods and used for covering or veneering inferior woods, the species generally used being those that possessed a pleasing grain and took a good finish. The tendency in the industry in more recent years, however, has been to produce veneers from the more common woods and to extend their use to cover a much wider field. Veneers are known as rotary cut, sliced, or sawed, according to the process by which they are made. The process chosen is determined largely by the kind of wood and the particular purpose for which the veneer is to be used.

The schedule used in collecting these statistics for 1919 called for the average cost of wood delivered at the mill per thousand feet log scale, in addition to the quantity consumed. The average cost was generally reported, but in a few instances it has been necessary to supply an average cost derived from other reports.

**Comparative consumption of wood, by states (Table 1).**—The veneer industry is widely distributed in the United States. In 1919 and 1909 reports were

received from 34 states and in 1911 from 33 states, all of the principal timber sections in the United States being represented in the statistics. The data relate to 362 establishments in 1919, 522 in 1911, and 637 in 1909.

While the number of establishments shows a decrease for both of the periods covered, the quantity of wood used increased 2 per cent from 1909 to 1911, and 29.6 per cent from 1911 to 1919. The quantity of wood consumed in 1919 was greater than that for any other year for which records are available.

The center of production has shifted according to the available supply of timber, as for most other industries depending upon forest products. In 1909 Illinois was the leading state in the use of wood in the manufacture of veneers, while Arkansas led in 1911 and 1919. The principal reason for the prominence of Arkansas in this industry is no doubt its large supply of suitable timber, particularly red gum. In 1919 this wood contributed 82.2 per cent of the total quantity of wood used in the industry in the state.

TABLE 1.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY STATES: 1919, 1911, AND 1909.

STATE.	QUANTITY OF WOOD (M FEET).			PER CENT DISTRI- BUTION.		
	1919	1911	1909	1919	1911	1909
United States.....	576,581	444,886	435,981	100.0	100.0	100.0
Arkansas.....	77,096	39,073	26,116	13.4	8.8	6.0
Wisconsin.....	50,502	30,059	31,737	8.8	6.8	7.3
Florida.....	43,936	20,664	33,293	7.6	4.6	7.6
Alabama.....	42,342	15,438	14,565	7.3	3.5	3.3
Mississippi.....	39,001	17,330	7,563	6.8	3.9	1.7
Tennessee.....	38,895	23,425	30,574	6.7	5.3	7.0
New York.....	38,571	23,578	24,218	6.7	5.3	5.6
North Carolina.....	36,423	24,061	19,984	6.3	5.4	4.6
Illinois.....	24,367	20,336	35,646	4.2	6.6	8.2
Indiana.....	24,254	28,525	31,472	4.2	6.4	7.2
Kentucky.....	22,971	29,194	19,350	4.0	6.6	4.4
Missouri.....	18,103	25,806	27,365	3.1	5.8	6.3
Georgia.....	14,863	5,890	6,980	2.6	1.3	1.6
Washington.....	14,329	7,533	5,419	2.5	1.7	1.2
Michigan.....	12,647	32,677	33,455	2.2	7.3	7.7
Maine.....	11,662	5,000	3,637	2.0	1.1	0.8
Louisiana.....	11,407	4,728	3,164	2.0	1.1	0.7
South Carolina.....	11,151	2,874	2,644	1.9	0.6	0.7
Oregon.....	8,704	6,581	3,201	1.5	2.2	0.8
Virginia.....	7,521	18,959	21,609	1.3	4.3	5.0
Ohio.....	6,042	13,374	10,985	1.0	3.0	2.5
Texas.....	5,174	4,573	6,710	0.9	1.0	1.5
Maryland.....	5,103	12,632	8,703	0.9	2.8	2.0
Vermont.....	4,971	5,575	8,013	0.9	1.3	1.8
West Virginia.....	3,478	5,558	4,401	0.6	1.2	1.0
New Jersey.....	1,197	863	1,046	0.2	0.2	0.2
Pennsylvania.....	1,002	2,607	3,691	0.2	0.6	0.9
All other states <sup>1</sup> .....	6,849	5,966	9,948	1.2	1.3	2.3

<sup>1</sup> Includes California, Colorado, Delaware, Kansas, Massachusetts, Minnesota, and New Hampshire for 1919; California, Delaware, Iowa, Massachusetts, Minnesota, and New Hampshire for 1911; and California, Delaware, Iowa, Massachusetts, Minnesota, New Hampshire, and Oklahoma for 1909.

Comparative consumption, by kinds of wood (Table 2).—In 1919, 37 different kinds of wood were reported as used in the manufacture of veneers. Of these, 1 imported wood and 12 native woods each contributed more than 10,000,000 feet. Red gum is used in the manufacture of veneers where inexpensive material is demanded, as well as for high-grade stock. It takes a fine finish and has a pleasing grain. For such years as data are available this wood has occupied first place, and yellow pine, maple, cottonwood, and white oak have vied for second place when ranked according to the quantity consumed. In 1919 red gum, yellow pine, and birch contributed 55.5 per cent of the total for the United States.

Consumption and cost, by kinds of wood (Table 3).—In 1909 the total cost of wood consumed in the manufacture of veneers was \$8,977,516. Compared with the cost for 1909, the cost for 1919 increased \$16,126,648, or 179.6 per cent, the greatest increases being for imported woods. The average cost per thousand feet increased 126.2 per cent for mahogany and 61.2 per cent for Spanish cedar, while for walnut, the highest-priced native wood, the average cost increased 74.2 per cent, and for white oak, 71.7 per cent.

The cost of wood was not reported for the year 1911.

TABLE 2.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY KINDS OF WOOD: 1919, 1911, AND 1909.

KIND OF WOOD.	QUANTITY OF WOOD (M FEET).			PER CENT DISTRI- BUTION.		
	1919	1911	1909	1919	1911	1909
Total.....	576,581	444,886	435,981	100.0	100.0	100.0
Domestic:						
Red gum.....	198,641	136,542	129,630	34.5	30.7	29.8
Yellow pine.....	97,071	35,400	48,143	17.0	8.0	11.0
Birch.....	54,079	24,208	24,643	9.4	5.4	5.7
Cottonwood.....	36,739	34,911	30,842	6.4	7.8	7.1
Tupelo.....	34,175	20,970	18,476	5.9	4.7	4.2
Yellow poplar.....	32,653	25,835	28,826	5.7	5.8	6.6
White oak.....	30,654	41,742	28,742	5.3	9.4	6.6
Maple.....	15,723	20,782	35,444	2.7	4.7	8.1
Walnut.....	14,060	4,121	2,400	2.4	0.9	0.6
Spruce.....	11,355	9,108	4,111	2.0	2.0	0.9
Basswood.....	11,134	11,602	13,715	1.9	2.6	3.1
Douglas fir.....	10,604	6,202	1,111	1.8	1.4	0.3
Birch.....	9,573	18,340	10,254	1.7	4.1	3.7
Beech.....	3,922	12,023	9,950	0.7	2.7	2.3
Ash.....	3,254	2,401	2,703	0.6	0.6	0.6
Red oak.....	3,161	9,207	6,661	0.5	2.1	1.5
Cypress.....	1,924		202	0.3		( <sup>1</sup> )
Sycamore.....	1,802	2,316	4,404	0.3	0.5	1.0
Western pine.....	1,659			0.3		
Hemlock.....	916	4,003	207	0.2	1.0	( <sup>1</sup> )
Magnolia.....	268		252	0.1		0.1
All other.....	783	3,652	4,415	0.1	0.8	1.0
Imported:						
Mahogany.....	27,628	4,700	10,057	4.8	1.1	3.7
Spanish cedar.....	4,771	5,348	5,140	0.8	1.2	1.2
All other <sup>2</sup> .....	27	1,557	3,353	( <sup>1</sup> )	0.4	0.8

<sup>1</sup> Less than one-tenth of 1 per cent.

<sup>2</sup> Includes butternut, hackberry, redwood, wahoo, white pine, holly, cherry, willow, chestnut, Port Orford cedar, black gum, and sugar pine.

<sup>3</sup> Includes Circassian walnut and English oak.

TABLE 3.—QUANTITY AND COST OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY KINDS OF WOOD: 1919.

KIND OF WOOD.	Quantity of wood (M feet).	COST.	
		Total.	Average per M feet.
Total.....	576,581	\$25,104,104	\$43.54
Domestic:			
Red gum.....	198,641	4,616,727	23.24
Yellow pine.....	97,071	1,268,605	13.02
Birch.....	54,079	2,577,924	47.67
Cottonwood.....	36,739	854,350	23.25
Tupelo.....	34,175	616,784	18.05
Yellow poplar.....	32,653	1,570,233	48.09
White oak.....	30,654	2,447,710	79.85
Maple.....	15,723	606,057	38.55
Walnut.....	14,060	1,068,837	120.88
Spruce.....	11,355	263,700	25.87
Basswood.....	11,134	530,082	47.61
Douglas fir.....	10,604	311,593	29.88
Birch.....	9,573	305,194	31.88
Beech.....	3,922	114,348	29.16
Ash.....	3,254	114,228	35.10
Red oak.....	3,161	146,577	46.37
Cypress.....	1,924	77,013	40.03
Sycamore.....	1,802	49,893	27.67
Western pine.....	1,659	26,380	15.90
Hemlock.....	916	32,122	35.07
Magnolia.....	268	2,754	10.28
All other <sup>1</sup> .....	783	28,967	36.98
Imported:			
Mahogany.....	27,628	6,092,375	220.51
Spanish cedar.....	4,771	708,931	148.59
All other <sup>2</sup> .....	27	12,700	470.37

<sup>1</sup> Includes butternut, hackberry, redwood, wahoo, white pine, holly, cherry, willow, chestnut, Port Orford cedar, black gum, and sugar pine.

<sup>2</sup> Includes Circassian walnut and English oak.

Consumption of wood, by method of manufacture (Table 4).—The rotary-cut method, by which a log or bolt mounted on a heavy lathe is turned against a stationary knife, is employed to a greater extent than any other in the manufacture of veneers. In 1919, 83.2 per cent of the wood consumed in the industry was cut by this method, which was used in all of the states reporting. The quantity of materials used for rotary-cut veneers formed the greater part of the total quantity cut into veneers for all states except Alabama, Illinois, Indiana, and New York. In Arkansas, Oregon, South Carolina, Texas, Vermont, and Virginia this was the only method reported. In 1909, 89.7 per cent of the total quantity of wood consumed in the manufacture of veneers was rotary cut; in 1908, 85.2 per cent; and in 1907, 83.7 per cent.

In 1919 the quantity consumed by the slicing method of manufacturing veneers formed 11.7 per cent of the total quantity used in the industry. This method is somewhat similar to the rotary cut, except that the materials are usually in the form of flitches, which are placed in the veneer machine vertically and forced downward against a stationary knife. Slicing is less wasteful than either sawing or rotary cutting, there being no saw kerf or core.

In Alabama and New York more than one-half of the wood consumed in the manufacture of veneers was sliced. This method was also employed to a great extent in Illinois, Indiana, and Tennessee. Nearly three-fourths of the mahogany and more than one-half of the Spanish cedar and native walnut was sliced.

Sawed veneers are most desirable for certain uses, and more than two-fifths of the white-oak veneers

were manufactured by sawing in 1919. This was the only native wood that showed a large percentage of sawed veneers, but a considerable part of the Spanish cedar and Circassian walnut was also cut by this process.

TABLE 4.—QUANTITY OF WOOD CONSUMED IN THE MANUFACTURE OF VENEERS, BY STATES AND BY METHODS: 1919.

STATE.	QUANTITY OF WOOD (M FEET).			
	Total.	Rotary cut.	Sliced.	Sawed.
United States.....	576,581	479,556	67,278	29,747
Arkansas.....	77,096	77,096	.....	.....
Wisconsin.....	50,502	47,804	2,698	.....
Florida.....	43,936	40,531	.....	3,405
Alabama.....	42,342	19,338	21,540	1,464
Mississippi.....	39,061	38,783	.....	278
Tennessee.....	38,895	31,879	4,416	2,600
New York.....	38,571	15,672	21,857	1,042
North Carolina.....	30,423	29,427	353	643
Illinois.....	24,367	10,954	7,177	6,236
Indiana.....	24,254	10,431	8,532	10,291
Kentucky.....	22,971	20,069	1,821	1,081
Missouri.....	18,103	17,882	221	.....
Georgia.....	14,863	14,764	.....	99
Washington.....	14,329	14,304	.....	25
Michigan.....	12,647	12,539	18	90
Maine.....	11,562	11,539	8	15
Louisiana.....	11,407	11,249	.....	158
South Carolina.....	11,151	11,151	.....	.....
Oregon.....	8,764	8,764	.....	.....
Virginia.....	7,521	7,521	.....	.....
Ohio.....	6,042	3,144	1,656	1,242
Texas.....	5,174	5,174	.....	.....
Maryland.....	5,103	3,998	1,105	.....
Vermont.....	4,971	4,971	.....	.....
West Virginia.....	3,478	3,106	178	194
New Jersey.....	1,197	841	.....	356
Pennsylvania.....	1,002	730	10	212
All other states <sup>1</sup> .....	6,849	5,845	688	319

<sup>1</sup> Includes California, Colorado, Delaware, Kansas, Massachusetts, Minnesota, and New Hampshire.

FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF DYSTUFFS AND EXTRACTS.

This report shows the quantity and value of crude forest products consumed in the manufacture of dyestuffs and extracts in 1919 as reported by 53 establishments in the United States. Data pertaining to a number of other establishments engaged in the manufacture of natural dyestuffs and extracts from partially manufactured forest products or vegetable materials are not included. The cost of all materials consumed, as well as other general and special statistics for the industry, are included in the report for the chemical group.

The schedule used for collecting these data called for the quantities of raw materials in cords, tons, or pounds. The quantities reported in pounds were converted into tons of 2,000 pounds, but those which were reported in cords were left to stand as shown, on the assumption that the ton and cord represent substantially the same quantity for such materials. The materials reported in cords were chestnut, larch, and Osage orange woods.

Some of the crude forest products reported were used in the manufacture of both dyestuffs and tanning

extracts, and it is impracticable to make a separation of the materials used in the two branches of the industry.

Consumption of raw forest products, by kinds (Table 5).—Chestnut wood is by far the most important native material used in the manufacture of tanning extracts. The native chestnut-oak and hemlock barks are also important materials used for tanning extracts, while black-oak bark is used for both dyestuffs and tanning. Logwood and fustic, imported principally from Mexico, Central America, and the West Indies, are the most important woods used for coloring. Osage orange is a native tree growing principally in southern Arkansas, Oklahoma, and northern Texas and is used to some extent in the manufacture of dyestuffs.

Sumac is used for both dyestuffs and tanning materials, while Brazilwoods and archil are used for dyestuffs. Larch and quebracho woods, spruce rossings, tanbark-oak and wattle barks are used in the manufacture of tanning extracts, as are also divi-divi, galls, gambier, and myrobalans. With the exception

of larch, Osage orange, spruce, and tanbark oak, all of the materials included under "Other" were imported.

TABLE 5.—PRINCIPAL RAW FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF NATURAL DYE STUFFS AND EXTRACTS: 1919.

KIND.	Quantity (tons).	COST.	
		Total.	Average per ton.
Total.....	950,275	\$12,133,799	\$12.77
Chestnut wood.....	754,972	7,040,603	9.33
Chestnut-oak bark.....	61,155	916,391	14.98
Logwood.....	53,851	1,833,684	34.05
Hemlock bark.....	25,594	627,064	24.54
Black-oak bark.....	10,353	134,117	12.95
Sumac leaves.....	5,504	330,671	60.08
Fustic wood.....	5,134	215,227	41.92
Brazilwoods.....	3,175	137,360	43.26
Other <sup>1</sup> .....	30,437	307,782	29.40

<sup>1</sup> Includes larch, Osage orange, and quebracho woods, and spruce rossings, tanbark-oak and wattle barks, and archil, divi-divi, galls, gambier, and myrobalans.

Consumption of raw forest products, by states (Table 6).—Virginia led in the consumption of chestnut-oak bark, reporting 76.8 per cent of the total for the United States. This state also reported 38 per cent of the chestnut wood and 13.8 per cent of the logwood consumed in 1919 in this industry. Tennessee reported 40.9 per cent of the total quantity of chestnut wood consumed in the manufacture of tanning extracts in

the United States, and 23.7 per cent of the hemlock bark. Chestnut wood was the only raw material reported in considerable quantity in North Carolina. Pennsylvania led in the consumption of hemlock and black-oak barks, logwood, fustic, and Brazilwoods. The principal materials consumed in West Virginia were chestnut and larch woods, spruce rossings, and chestnut-oak and hemlock barks. New Jersey was prominent in the consumption of logwood, fustic, Brazilwoods, and gambier, and New York in that of logwood, quebracho, and sumac. The principal materials reported for Massachusetts were Brazilwoods, myrobalans, divi-divi, sumac, and gambier.

TABLE 6.—QUANTITY AND COST OF PRINCIPAL RAW FOREST PRODUCTS CONSUMED IN THE MANUFACTURE OF NATURAL DYE STUFFS AND EXTRACTS, BY STATES: 1919.

STATE.	Quantity (tons).	Cost.
United States.....	950,275	\$12,133,799
Virginia.....	350,681	3,724,024
Tennessee.....	321,631	3,129,645
North Carolina.....	122,379	1,227,219
Pennsylvania.....	70,175	1,022,434
West Virginia.....	41,483	602,560
New Jersey.....	12,984	478,201
New York.....	12,623	758,000
Massachusetts.....	404	24,130
All other states <sup>1</sup> .....	11,915	267,556

<sup>1</sup> Includes California, Illinois, Maryland, and Michigan.

### FOREST PRODUCTS CONSUMED IN TANNING.

The principal materials used in tanning are obtained from certain barks, woods, fruits, nuts, etc., which contain an astringent known as tannin. While tannin is found in greater or less quantities in the great majority of the plant species, comparatively few of them have been utilized for tanning purposes. The principal native barks and woods used in 1919 were hemlock and oak barks and chestnut wood. Of the imported tanning materials used, quebracho, myrobalans, divi-divi, sumac, mangrove, and gambier are the most important, although several other kinds are being used in increasing quantities.

While the New England states have been prominent in this industry from its earliest period, the center of activity has shifted southward and westward in accordance with the availability of the supply of raw materials.

The tanneries using bark or wood were usually located near the source of supply of these materials, owing to the cost of transportation involved. The tendency of late years, however, has been for the tanners to buy a large part of the tanning materials in the form of extracts, and consequently the remoteness of the source of tanbark and wood is not so important as the marketing facilities for the finished product.

In 1919 there were 486 establishments in the United States using vegetable tanning materials. Of this number, 72 used bark, wood, and other raw vegetable materials exclusively; 188 used extracts exclusively;

and 226 used both raw materials and extracts. In 1909 the number of establishments was reported as 592, of which 117 used raw vegetable materials exclusively; 138, extracts exclusively; and 337, both raw materials and extracts.

The greater number of establishments in 1909 is due largely to the difference in reporting at the two censuses. The number shown for 1909 represents tanneries, while the number of "establishments" was reported in 1919. An establishment may in some cases represent several plants.

Reports were received from 31 states in 1919, in comparison with 33 states in 1909 and 1907.

Comparative consumption of vegetable tanning materials (Table 7).—The consumption of tanbark, wood, and other raw vegetable materials in tanning has been decreasing for several years. In 1907 the total quantity of such materials used was 1,214,401 tons, and the quantity consumed in 1909 compared with that for 1907 showed a decrease of 11.2 per cent. The decrease in the quantity for the ten-year period from 1909 to 1919 was 43.5 per cent. This decrease was chiefly in the use of hemlock bark.

From 1906 to 1909, inclusive, the quantity of hemlock bark used was more than double that of oak bark, but in 1919 the quantity of oak bark used was only 8 per cent less than the total quantity of hemlock bark. Hemlock has held first place and oak second place for all years for which figures are available, but at the

present rate of decrease in the use of hemlock bark and the tendency of oak to hold its own, it seems altogether likely that oak bark will soon take the lead. In 1919 the cost of oak bark—not including oak and chestnut mixed costing \$649,011—exceeded that of hemlock by \$37,482. The use of chestnut wood in 1919 showed an increase of 13,999 tons as compared with the consumption for 1909. The average cost per ton of tanbark, wood, and other raw materials in 1905 was \$7.46; in 1909, \$10.31; and in 1919, \$19.75.

The statistics for tanning extracts present a striking contrast to those for tanbark, wood, etc., in that there

has been a decrease in the use of the latter but a very marked increase in the quantity and cost of extracts consumed. The total cost of extracts used in 1906 was equal to about two-thirds the total cost of tanbark, wood, and other raw materials; in 1909 the costs were about equal; but in 1919 the cost of extracts was about three times that of raw materials. The total cost of vegetable tanning extracts used in 1906 was \$8,713,322. The increase from 1906 to 1909 was 23.7 per cent, while the increase from 1909 to 1919 was 220.8 per cent.

TABLE 7.—VEGETABLE TANNING MATERIALS CONSUMED, BY KINDS: 1919 AND 1909.

KIND.	TANBARK, WOOD, ETC.				EXTRACTS.			
	1919		1909		1919		1909	
	Quantity (tons).	Cost.	Quantity (tons).	Cost.	Quantity (pounds).	Cost.	Quantity (pounds).	Cost.
Total.....	609,130	\$12,027,687	1,078,910	\$11,125,750	794,360,977	\$34,579,165	386,817,895	\$10,779,177
Hemlock.....	284,323	4,389,883	608,265	6,434,848	27,034,915	874,142	10,862,540	276,436
Oak.....	1,261,519	15,076,356	324,070	3,533,962	2,57,869,387	2,312,490	38,419,398	737,220
Chestnut.....	32,520	306,681	18,527	65,152	432,120,247	16,297,017	182,818,961	3,579,929
Myrobalans.....	8,354	488,982	18,000	534,727	2,973,306	96,000	1,191,303	37,571
Divi-divi.....	4,725	381,698			12,772,793	511,794		
Quebracho.....	2,346	244,195			159,320,510	10,749,078	147,109,443	5,877,989
Sumac.....	2,328	203,458			6,669,642	386,923	350,535	16,167
Mangrove.....	2,078	125,750	18,925	514,169	4,968,440	266,437	1,401,008	43,569
Logwood <sup>1</sup> .....	955	110,020			1,579,791	285,397		
Valonia.....	303	22,303			174,504	10,021	243,536	18,622
Gambier.....	189	51,034			4,129,109	647,572	2,641,001	133,765
Spruce.....	156	1,593			48,061,287	756,049		
Larch.....					5,976,016	221,544		
All other.....	9,328	625,754	1,023	42,992	30,711,080	1,173,701	1,870,170	58,512

<sup>1</sup> Includes 33,917 tons of oak and chestnut mixed, costing \$649,011.  
<sup>2</sup> Includes 31,840,009 pounds of mixed oak and chestnut extract, costing \$1,219,620.

<sup>3</sup> Used for dyeing.

Consumption of tanbark, wood, etc., by states (Table 8).—In 1919, 298 establishments in 28 states reported the consumption of tanbark, wood, etc. Pennsylvania, Michigan, Virginia, and North Carolina each reported a consumption of more than 50,000 tons. The total quantity consumed by these states constituted 58.4 per cent of the total for the United States. In 1909 Pennsylvania, Wisconsin, West Virginia, and Michigan reported 60.5 per cent of the total consumption for that year.

Pennsylvania has been the leading state in the consumption of tanbark for all years for which records are available, while the relative importance of the other states has changed from year to year.

In 1905 the consumption of tanbark, wood, etc., in Pennsylvania was 428,709 tons. This is the largest quantity of record consumed in a single state in any one year.

The leading states in the consumption of these materials in 1919 were Pennsylvania in hemlock, logwood, mangrove, myrobalans, quebracho, sumac, valonia, and "All other"; Michigan in divi-divi; New Jersey in gambier; New York in spruce; North Carolina in chestnut; and Virginia in oak.

The consumption of hemlock bark in Pennsylvania in 1919 was 99,272 tons, and the consumption of oak

bark in Virginia was 64,123 tons. These figures show a marked decrease when compared with 379,806 tons of hemlock consumed in Pennsylvania and 73,871 tons of oak consumed in Virginia in 1905.

TABLE 8.—TANBARK, WOOD, ETC., CONSUMED, BY STATES: 1919 AND 1909.

STATE.	1919		1909	
	Quantity (tons).	Cost.	Quantity (tons).	Cost.
Total.....	609,130	\$12,027,687	1,078,910	\$11,125,750
Pennsylvania.....	142,706	2,969,578	310,279	2,997,026
Michigan.....	79,355	1,618,141	100,285	1,225,655
Virginia.....	71,782	1,222,400	89,580	871,853
North Carolina.....	61,745	962,207	50,683	445,621
Wisconsin.....	38,624	527,502	126,015	1,252,434
California.....	35,213	1,092,185	37,130	744,768
Massachusetts.....	33,947	751,913	28,426	318,133
West Virginia.....	30,857	498,411	115,689	975,682
Tennessee.....	21,495	343,957	25,438	223,247
New York.....	21,433	548,340	81,711	816,885
Maryland.....	11,186	195,246	12,781	132,958
Kentucky.....	9,810	177,835	16,905	177,839
Maine.....	9,710	126,293	12,633	106,513
Ohio.....	8,513	177,428	19,626	229,562
Missouri.....	7,936	142,874	4,183	57,379
Illinois.....	7,388	132,006	16,109	167,926
Georgia.....	4,331	201,066	5,290	52,112
Indiana.....	2,673	55,005	7,668	84,776
New Jersey.....	2,915	143,787	19,368	157,425
All other states <sup>1</sup> .....	7,211	141,513	7,818	87,956

<sup>1</sup> Includes Alabama, Connecticut, Delaware, Louisiana, Minnesota, New Hampshire, Oregon, Texas, and Vermont in 1919; Alabama, Connecticut, New Hampshire, Oregon, Vermont, and Washington in 1909.

Illinois, Indiana, Maryland, Massachusetts, Missouri, New Jersey, New York, North Carolina, and Ohio show gains in the consumption of tanbark in 1919 over that for 1905, but only three states—Massachusetts, Missouri, and North Carolina—show gains in 1919 as compared with 1909, and in these states the gains were very small.

Consumption of tanning extracts (Table 9).—The consumption of tanning extracts was reported by 30 states in 1919. Pennsylvania, Michigan, New York, West Virginia, New Jersey, North Carolina, and Massachusetts, ranking in the order named, used 76.9 per cent of the total quantity of extracts reported for the United States.

The consumption of tanning extracts has greatly increased since 1905. In that year the reported consumption was 146,199,500 pounds; in 1907, 364,899,535 pounds; in 1909, 386,817,895 pounds; and in 1919, 794,360,977 pounds; the percentage of increase being 149.6 per cent from 1905 to 1907, 6 per cent from 1907 to 1909, and 105.4 per cent from 1909 to 1919.

In these statistics is shown the total weight of both solid and liquid extracts consumed in specified years. These extracts contain various proportions of tannin, ranging from about 25 per cent for liquids to about 65 per cent for solids.

The average cost per pound of extract for 1907 was 2.6 cents; for 1909, 2.8 cents; and for 1919, 4.4 cents.

TABLE 9.—TANNING EXTRACTS CONSUMED, BY STATES: 1919 AND 1909.

STATE.	1919		1909	
	Quantity (pounds).	Cost.	Quantity (pounds).	Cost.
Total.....	794,360,977	\$31,579,165	386,817,895	\$10,779,177
Pennsylvania.....	256,462,830	10,563,751	121,712,847	3,065,942
Michigan.....	83,304,039	3,443,442	23,008,343	752,387
New York.....	70,943,005	3,350,326	30,005,721	991,366
West Virginia.....	59,691,889	2,302,198	27,653,815	857,068
New Jersey.....	47,778,121	2,370,993	18,500,877	526,028
North Carolina.....	45,110,086	1,061,107	19,018,938	326,284
Massachusetts.....	41,435,783	2,700,733	28,154,770	823,205
Kentucky.....	31,365,911	1,182,239	18,005,512	397,616
Wisconsin.....	31,052,192	1,821,730	23,595,933	725,131
Virginia.....	30,860,385	1,222,353	17,312,089	277,498
Ohio.....	27,381,464	1,338,355	14,705,808	397,157
Tennessee.....	12,717,565	501,769	4,992,060	94,429
Illinois.....	7,518,433	612,288	4,584,573	144,433
Missouri.....	7,072,708	201,730	1,298,767	41,631
Maine.....	6,980,464	248,093	5,583,400	100,933
Indiana.....	6,076,871	270,531	7,710,000	166,370
Maryland.....	6,008,632	369,969	4,370,843	106,868
New Hampshire.....	4,712,959	237,838	(1)	(1)
California.....	4,084,976	243,223	3,290,121	160,731
Minnesota.....	934,000	54,122	957,435	27,061
Connecticut.....	650,547	46,175	(1)	(1)
Delaware.....	372,811	74,051	(1)	(1)
All other states <sup>1</sup> .....	5,831,020	172,340	6,037,434	197,544

<sup>1</sup> Included in "All other states."

<sup>2</sup> Includes Alabama, Colorado, Georgia, North Dakota, Oregon, Texas, Vermont, and Washington in 1919; Alabama, Colorado, Connecticut, Delaware, Georgia, Iowa, Louisiana, New Hampshire, North Dakota, Oregon, South Dakota, Texas, Vermont, and Washington in 1909.

## WOOD CONSUMED IN DISTILLATION.

The manufacture of charcoal by carbonization is an old industry, but the present methods of wood distillation for the purpose of recovering the volatile products are comparatively modern and the industry in the United States dates from about the middle of the nineteenth century.

Two distinct processes are employed to secure the several volatile distillates or other crude products—the destructive process and the steam process. In the former process the wood is heated to such a temperature that the fiber is destroyed and new products created. In the latter the volatile substances are removed from the wood by the use of steam, which does not destroy the fiber.

The industry is divided into two distinct branches—hardwood distillation and softwood distillation. Measured by the quantity of wood used, the hardwood branch is by far the more important, consuming 82.2 per cent of the total quantity of wood used for distillation in the United States in 1919. This branch is confined practically to the Northern and Central states, where the supply of suitable wood is more abundant. Softwood distillation is carried on largely in the South Atlantic and Gulf states, and the southern longleaf pine is the principal

raw material used in this industry which requires resinous woods.

The wood-distillation industry compared with the lumber industry is of minor importance as a consumer of timber or as a drain on the forest resources of the Nation. However, in 1919 approximately 750 million board feet of wood were used in distillation.

Several important establishments manufacturing wood-distillation products are operated in connection with the manufacture of lumber. These plants utilize the slabs, sawdust, and other waste products of the sawmill or timber camp. A considerable quantity of wood waste which might have been available for distillation is, however, destroyed or discarded.

Comparative consumption of wood (Table 10).—Statistics for the wood-distillation industry were first published by the Bureau of the Census for 1879, in which year 17 establishments were engaged in the manufacture of acetate of lime and crude wood alcohol. In 1890 the number of establishments had increased to 53. Data pertaining to the quantity of wood consumed are not available for these two years. Statistics showing the number of establishments and the consumption of wood for each year for which data are available are shown in Table 10.

The number of establishments shown in the table is not strictly comparable on account of the different methods of reporting for the various censuses. From 1905 to 1911 the number of plants was reported, while for the other years the number of establishments is given. As a rule, the term "establishment" represented a single plant or factory, but in some cases it represented two or more plants which were operated under a common ownership and for which one set of books of account was kept.

TABLE 10.—WOOD CONSUMED IN DISTILLATION FOR SPECIFIED YEARS: 1899-1919.

YEAR.	NUMBER OF ESTABLISHMENTS.			QUANTITY (CORDS).		
	Total <sup>1</sup>	Hard-woods.	Soft-woods.	Total.	Hardwoods.	Soft-woods.
1919.....	112	87	25	1,442,675	1,186,477	256,198
1914.....	101	86	15	1,042,617	970,308	72,209
1911.....	135	105	30	1,221,359	1,058,955	162,404
1910.....	147	117	30	1,450,439	1,257,997	192,442
1909.....	147	116	31	1,265,157	1,149,847	115,310
1908.....	131	101	30	977,844	878,632	99,212
1907.....	131	100	31	1,282,120	1,219,771	62,349
1906.....	119	88	33	1,195,130	1,144,896	50,234
1905.....	82	67	15	676,739	659,770	16,969
1904.....	150	119	31	1,049,503	1,018,072	31,431
1899.....	111	107	4	490,939	487,805	3,134

<sup>1</sup> Includes 1 establishment in 1919 and 6 in 1914 engaged primarily in other industries.

HARDWOOD DISTILLATION.

Consumption of wood, by states (Table 11).—The relative importance of the states engaged in hardwood distillation from the standpoint of wood consumed has remained about the same from year to year, the leading states being Michigan, Pennsylvania, and New York. In 1919 these three states consumed 87.2 per cent of the total quantity of hardwoods used in distillation.

TABLE 11.—HARDWOODS CONSUMED IN DISTILLATION, BY STATES: 1919.

STATE.	Number of establishments.	QUANTITY.		COST.	
		Cords.	Per cent distribution.	Total.	Average per cord.
United States.....	87	1,186,477	100.0	\$17,965,069	\$6.71
Michigan.....	15	648,910	54.7	4,307,797	6.64
Pennsylvania.....	42	281,320	23.7	1,882,795	6.69
New York.....	20	104,493	8.8	747,882	7.16
Wisconsin.....	3	60,544	5.1	519,131	8.57
All other states.....	7	91,210	7.7	1,507,464	5.56

<sup>1</sup> Includes 1 establishment engaged in wood distillation, but primarily operating a blast furnace.

<sup>2</sup> Includes establishments distributed as follows: Alabama, 1; Connecticut, 1; Kentucky, 1; Mississippi, 1; Missouri, 1; Tennessee, 1; and West Virginia, 1.

Beech, birch, and maple have been the principal hardwoods used for all years for which records are available. A few other species have been used from time to time, but they have been of less importance, and in many instances not reported separately. In

1919 the hardwoods reported under "All other" included alder, ash, cherry, gum, chestnut, ironwood, and a few other kinds not specified.

Products.—The principal basic products obtained from the hardwoods by distillation are crude wood alcohol, charcoal, acetates, tar, and tar oils, and the quantity of each that a cord of wood will yield depends largely on the kind and efficiency of the equipment used. Many of the plants are converting their primary products into more highly manufactured forms and some products that were wasted in the early stages of the industry are now saved. Of the crude wood alcohol produced, 6,980,693 gallons were produced for sale and 2,123,303 gallons were consumed by the establishments reporting in the manufacture of refined wood alcohol and other derived products, such as formaldehyde, acetone, methyl acetone, ketone, etc. A considerable quantity of charcoal was reported as produced and consumed by establishments operating blast furnaces. Statistics pertaining to the refined or remanufactured products are presented in the report for the chemical group.

The quantities of the principal basic products of the hardwood-distillation industry for 1919 are shown in the following statement:

KIND.	Quantity.
Crude wood alcohol.....	gallons.. 19,103,996
Acetate of lime.....	pounds.. 168,956,432
Charcoal.....	bushels.. 46,354,342
Tar.....	gallons.. 552,124
Tar oils.....	gallons.. 222,398
Wood creosote.....	pounds.. 945,605

<sup>1</sup> Includes a small amount of wood alcohol manufactured from softwoods.

SOFTWOOD DISTILLATION.

Consumption of wood, by states (Table 12).—The consumption of wood in the softwood branch of the industry was greater in 1919 than for any other year for which records are available.

Georgia was the leading state in the quantity of softwoods distilled in 1905, 1908, and 1919, North Carolina in 1906 and 1907, and Alabama, in 1909. Florida has held second place for all years of record since 1906. The plants in the various states reporting softwood distillation in 1919 were located mainly in counties bordering on the Atlantic Ocean or the Gulf of Mexico.

The principal wood used in this industry is long-leaf yellow pine, although other resinous woods have been used in limited quantities. In 1908 the use of Douglas fir was reported to the extent of 974 cords, and Norway pine in the Lake states has also been used for distillation.

The successive canvasses since 1899 show increases in the quantity of softwoods used, except for the years 1905, 1911, and 1914.

## FOREST PRODUCTS.

TABLE 12.—SOFTWOODS CONSUMED IN DISTILLATION, BY STATES: 1919.

STATE.	Number of establishments.	QUANTITY.		COST.	
		Cords.	Per cent distribution.	Total.	Average per cord.
United States.....	25	256,198	100.0	\$1,593,977	\$6.22
Georgia.....	7	103,964	40.6	561,576	5.40
Florida.....	6	86,065	33.6	618,743	7.19
Alabama.....	3	41,416	16.2	264,912	6.40
Louisiana.....	14	18,005	7.0	95,788	5.32
All other states.....	25	6,748	2.6	52,958	7.85

<sup>1</sup> Includes 1 establishment distilling sawdust.

<sup>2</sup> Includes establishments distributed as follows: Michigan, 1; Mississippi, 1; North Carolina, 2; and Texas, 1.

**Products.**—The principal products obtained from distilling the softwoods are rosin, turpentine, tar, tar oils, charcoal, and wood creosote.

It is interesting to note that rosin, one of the most important products of softwood distillation in 1919, was classed with "All other" as a minor product for previous years.

The quantities of the principal products of the softwood-distillation industry for 1919 are shown in the following statement:

KIND.	Quantity.
Rosin.....barrels (280 pounds).....	234,030
Turpentine.....gallons.....	1,534,333
Tar.....gallons.....	2,125,757
Tar oils.....gallons.....	881,042
Charcoal.....bushels.....	1,702,103
Wood creosote.....pounds.....	207,050

## EQUIPMENT.

The wood-distillation industry has gone through several stages of development since it was established in the United States.

Brick kilns were first employed to recover the condensable gases which were lost in burning charcoal in the old wasteful pits. This kind of equipment is still being utilized, but a great step forward was made when the use of iron retorts, built in pairs, was inaugurated. Large rectangular ovens or retorts represent a still later improvement, and these are being installed in many of the larger plants in place of the iron retorts.

TABLE 13.—EQUIPMENT.

STATE.	Aggregate capacity (cords).	KIND AND CAPACITY OF EQUIPMENT.							
		Retorts.		Ovens.		Kilns.		Steam extractors.	
		Number.	Total capacity (cords).	Number.	Total capacity (cords).	Number.	Total capacity (cords).	Number.	Total capacity (cords).
United States.....	16,088	824	3,140	243	2,008	167	10,070	132	870
Hardwood distillation.....	14,684	628	2,676	232	1,938	167	10,070		
Michigan.....	9,482	100	1,102	20	180	130	8,200		
New York.....	605	188	279	47	380				
Pennsylvania.....	2,118	214	686	159	1,312	12	120		
Wisconsin.....	1,832	10	82			25	1,750		
All other states <sup>1</sup> .....	587	56	527	6	60				
Softwood distillation.....	1,404	196	464	11	70			132	870
Alabama.....	100	20	10					60	150
Florida.....	420	18	30	11	70			40	320
Georgia.....	609	76	308					22	363
Louisiana.....	57	32	40					8	17
All other states <sup>2</sup> .....	98	50	78					2	20

<sup>1</sup> Includes Alabama, Connecticut, Kentucky, Mississippi, Missouri, Tennessee, and West Virginia.

<sup>2</sup> Includes Michigan, Mississippi, North Carolina, and Texas.