

MANUFACTURES.

GENERAL TABLES.

Table 25 gives for 1919 and 1914 a comparative summary, by states, for number of establishments, average number of wage earners, primary horsepower, cost of materials, and value of products; and Table 11 presents for 1919 the detailed statistics for the industry, by states.

TABLE 25.—COMPARATIVE SUMMARY, BY STATES: 1919 AND 1914.

STATE.	Cen- sus year.	Num- ber of estab- lish- ments	Wage earners (aver- age num- ber).	Primary horse- power.	Expressed in thousands.			STATE.	Cen- sus year.	Num- ber of estab- lish- ments	Wage earners (aver- age num- ber).	Primary horse- power.	Expressed in thousands.		
					Wages.	Cost of mate- rials.	Value of prod- ucts.						Wages.	Cost of mate- rials.	Value of prod- ucts.
United States.....	1919	26	2,173	17,621	\$3,052	\$100,573	\$120,638	New York.....	1919	6	582	5,951	\$888	\$29,387	\$35,565
	1914	25	1,488	15,511	1,127	39,555	44,883		1914	6	538	5,147	378	14,121	16,687
	1909	20	1,452	13,211	893	31,035	36,739	Ohio.....	1919	3	270	1,518	275	7,761	9,369
Minnesota.....	1919	6	483	4,102	647	28,796	33,238		1914	3	150	1,603	116	3,642	3,958
	1914	6	400	4,467	326	11,279	12,357	All other states.....	1919	11	838	6,052	1,242	34,634	42,436
									1914	10	400	4,294	307	10,513	11,881

TABLE 26.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments	PERSONS ENGAGED IN THE INDUSTRY.								WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.			Capital.	EXPENSES.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	10 and over.			Salaries and wages.	
					Male.	Female.	Average number.	Number, 15th day of—			Male.	Female.		Officials.	Clerks, etc.
								Maximum month.	Minimum month.						
United States.....	26	2,751	4	113	295	166	2,173	Jy 2,465	Mh 1,825	2,318	2,263	55	\$73,954,065	\$836,465	\$572,638
Minnesota.....	6	617		30	65	39	483	Jy 577	My 416	504	498	6	19,648,821	342,482	125,280
New York.....	6	754	2	32	89	49	582	Se 740	Mh 404	706	704	2	29,338,293	165,139	172,392
Ohio.....	3	357		17	43	27	270	Ja 295	Au 248	250	246	4	3,822,151	89,725	96,106
All other states ¹	11	1,023	2	34	98	51	838	.....	.....	858	815	43	21,144,800	239,119	179,180

STATE.	EXPENSES—continued.						Value of products.	Value added by manufacture.	POWER.				
	Salaries and wages—Continued.	For contract work.	Rent and taxes.		For materials.				Primary horsepower.				Electric horsepower generated in establishments reporting.
			Rent of factory.	Taxes, Federal, state, county, and local	Principal materials.	Fuel and rent of power.			Total.	Owned.		Rented (electric).	
										Steam engines (not turbines).	Water power. ²		
United States.	\$3,052,269	\$8,201	\$4,256	\$1,205,602	\$99,908,059	\$869,479	\$120,638,100	\$20,080,562	17,621	9,175	250	8,196	2,079
Minnesota.....	646,813			333,945	28,623,332	172,652	33,237,740	4,441,756	4,102	2,480		1,622	79
New York.....	888,347	6,201		531,132	29,216,719	170,342	35,594,760	6,207,699	5,951	1,706	250	3,995	365
Ohio.....	275,212		612	105,992	7,696,538	64,214	9,368,779	1,608,027	1,516	850		666	250
All other states ¹	1,241,897		3,644	324,533	34,371,470	262,271	42,436,821	7,803,080	6,052	4,139		1,913	1,985

¹ All other states embrace: Illinois, 2 establishments; Iowa, 2; Kansas, 1; New Jersey, 2; Oregon, 1; Washington, 1; and Wisconsin, 2.
² Includes water wheels and turbines (irrespective of ownership of water supply).

BONE, CARBON, AND LAMP BLACK.

GENERAL STATISTICS.

General character of the industry.—The census classification covers establishments engaged primarily in the carbonization of bone in retorts, producing bone black, "char," or animal charcoal; in the manufacture of carbon black by the imperfect combustion of natural gas; and of lampblack from the smoke of the imperfect combustion of coal or wood tar or petroleum, rosin, etc. The production of ivory black by the carbonization of ivory scrap and waste is also included. At censuses prior to 1909 the industry was known as "Bone, ivory, and lamp black."

Comparative summary.—Table 27 gives the general statistics for the census years 1899 to 1919, inclusive. At the census of 1889, 24 establishments were reported, with products valued at \$1,030,030; in 1879, 18 establishments and \$661,376 in value of products; in 1869, 9 establishments and \$193,800 in value of products; in 1859, 24 establishments and \$376,710 in value of products; and in 1849, 5 establishments with \$42,250 in value of products.

Persons engaged in the industry.—The total number of persons engaged in the industry in 1919 was 826, comprised of 675 wage earners, 108 proprietors and officials, and 43 clerks. Of the total number employed, only 2.2 per cent were females, most of whom were clerks.

Wage earners, by months.—The largest number of wage earners reported for any month of 1919 was 695 for October, and the smallest 654; 94.1 per cent of the maximum, was reported for January.

Prevailing hours of labor.—The majority of the wage earners were employed in establishments where the prevailing hours of labor per week were in excess of 54. Of the 675 wage earners only 17.3 per cent

were reported for establishments working 54 or less hours per week.

Size of establishments, by average number of wage earners.—Table 28 presents the statistics by size groups according to number of wage earners. The average for all establishments was 19 in 1919, 13 in 1914, and 8 in 1909.

Size of establishments, by value of products.—The average value of products per establishment increased from \$40,500 in 1909 to \$54,206 in 1914, and to \$176,749 in 1919. Table 29 shows a general advance from lower to higher groups for 1919 as compared with 1914, due essentially to advance in values.

Character of ownership.—There were 26 establishments in the industry in 1919 under corporate ownership, with products valued at \$4,698,012, or 75.9 per cent of the total for the industry, 6 owned individually, with 17.6 per cent of all products; and 3 by firms, with 6.5 per cent. In 1914, 18 establishments under corporate ownership had products valued at \$1,075,098, or 73.5 per cent of the total, and 7 were individual establishments, and 2 were firms.

Number and horsepower of types of prime movers.—Table 30 presents the statistics concerning power. Of the total primary power, 26.4 per cent was purchased electric power in 1919 as compared with 4 per cent in 1914.

Fuel consumed.—The industry is a large consumer of natural gas. In 1919 the consumption as reported was 49,495,995,000 cubic feet of gas, together with 6,661 net tons of bituminous coal, 25 long tons of anthracite, and 1,200 barrels of oil. The fuel consumed in 1914 included 19,470,270,000 cubic feet of gas, 1,872 net tons of bituminous coal, and 375 long tons of anthracite.

TABLE 27.—COMPARATIVE SUMMARY: 1919, 1914, 1909, 1904, AND 1899.

	1919	1914	1909	1904	1899	PER CENT OF INCREASE. ¹			
						1914-1919	1909-1914	1904-1909	1899-1904
Number of establishments.....	35	27	27	25	15				
Persons engaged.....	826	437	302	258	123	89.0	44.7	17.1	109.5
Proprietors and firm members.....	30	17	7	11	17	76.5	142.9	-36.4	-35.3
Salaried employees.....	121	81	67	47	21	49.4	20.9	42.6	123.8
Wage earners (average number).....	675	339	228	200	85	99.1	48.7	14.0	135.3
Primary horsepower.....	1,857	1,816	1,023	1,085	365	2.3	77.5	-5.7	197.3
Capital.....	\$9,790,187	\$4,905,400	\$1,841,906	\$1,663,143	\$782,247	98.0	171.2	10.8	112.6
Salaries and wages.....	1,120,718	336,001	227,660	153,649	69,767	233.5	47.6	48.2	120.3
Salaries.....	312,386	105,180	78,333	48,490	23,650	197.0	34.3	61.5	105.0
Wages.....	808,332	230,821	149,327	105,159	46,107	260.2	54.6	42.0	128.1
Paid for contract work.....	4,500	350			891				
Rent and taxes.....	177,186	21,905	22,351	12,150	8,885	705.6	-1.6	83.9	35.8
Cost of materials.....	2,848,059	686,240	444,608	203,396	105,712	315.0	54.3	118.6	92.4
Value of products.....	6,186,204	1,463,569	1,093,494	647,717	359,787	322.7	33.8	68.8	80.0
Value added by manufacture.....	3,338,145	777,320	648,886	444,821	254,075	329.4	19.8	46.0	74.9

¹ A minus sign (—) denotes decrease; percentages are omitted where base is less than 100. ² Exclusive of internal revenue. ³ Value of products less cost of materials.

MANUFACTURES.

TABLE 28.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS: 1919, 1914, AND 1909.

CLASS.	BONE, CARBON, AND LAMP BLACK.									CLASS.	BONE, CARBON, AND LAMP BLACK.								
	Number of establishments.			Wage earners (average number).			Per cent distribution.				Number of establishments.			Wage earners (average number).			Per cent distribution.		
	1919	1914	1909	1919	1914	1909	1919	1914	1909		1919	1914	1909	1919	1914	1909	1919	1914	1909
Total.....	35	27	27	675	339	228	100.0	100.0	100.0	Establishments employ- ing—Continued. 6 to 20 wage earners... 21 to 50 wage earners... Over 50 wage earners.									
Establishments employ- ing—											16	10	9	183	130	118	27.1	38.3	51.8
1 to 5 wage earners..	10	14	15	39	41	50	5.8	12.1	21.9		6	1	2	173	44	60	25.0	13.0	26.3
										3	2	.....	280	124	.....	41.5	36.6	.....

TABLE 29.—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
	1919	1914	1909	1919	1914	1909	1919	1914	1909	1919	1914	1909
All classes.....	35	27	27	675	339	228	\$6,186,204	\$1,463,569	\$1,093,494	\$3,838,145	\$777,329	\$648,886
Less than \$5,000.....	1	3	3	6	7	2	25,881	12,543	7,114	11,971	8,397	4,502
\$5,000 to \$20,000.....	2	7	7	19	33	83	86,015	86,163	86,163	53,995	56,624	56,624
\$20,000 to \$100,000.....	15	11	13	114	92	99	805,883	447,723	519,114	405,602	285,308	306,517
\$100,000 to \$500,000.....	117	6	4	555	221	94	5,354,440	915,288	481,103	2,920,572	429,029	281,243
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.....	2.9	11.1	11.1	0.9	2.1	0.9	0.4	0.9	0.6	0.4	1.1	0.7
\$5,000 to \$20,000.....	5.7	25.9	25.9	16.9	5.6	14.5	13.0	6.0	7.9	12.2	6.9	8.7
\$20,000 to \$100,000.....	42.9	40.8	48.2	82.2	27.1	43.4	88.6	30.6	47.5	487.4	36.7	47.2
\$100,000 to \$500,000.....	48.6	22.2	14.8	1	65.2	41.2		62.5	44.0		55.3	43.3

¹ Includes the group "\$1,000,000 and over."

TABLE 30.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919 AND 1914.

POWER.	Number of en- gines or mo- tors, 1919.	HORSEPOWER.				POWER.	Number of en- gines or mo- tors, 1919.	HORSEPOWER.			
		Amount.		Per cent distribution.				Amount.		Per cent distribution.	
		1919	1914	1919	1914			1919	1914	1919	1914
Primary power, total.....	85	1,857	1,816	100.0	100.0	Electric.....	34	491	81	100.0	100.0
Owned.....	61	1,366	1,713	73.6	94.3	Rented.....	34	491	73	100.0	90.1
Steam engines (not turbines).....	9	455	502	24.0	27.6	Generated by establishments reporting.....			8	.....	9.9
Internal-combustion engines.....	42	911	1,211	49.6	66.7						
Rented.....	34	491	103	26.4	5.7						
Electric.....	34	491	73	26.4	4.0						
Other.....		.....	30	.....	1.7						

SPECIAL STATISTICS.

Table 31 presents the production statistics for bone, carbon, and lamp black for 1919 in comparison with 1914 and 1909. The statistics include production by all classes of establishments, those producing carbon, bone, or lamp black as a subordinate or subsidiary

product, as well as those included within the classified industry. The figures, however, do not include black pigments made and consumed by paint manufacturers and marketed in paint or other form, the production of such intermediates not being reported separately.

TABLE 31.—PRODUCTS: 1919, 1914, AND 1909.

	1919	1914	1909		1919	1914	1909
Number of establishments.....	46	39	57	PRODUCTS—continued.			
The classified industries:				Carbon black:			
Carbon black.....	29	20		Number of establishments ¹	32	20	18
Bone black.....	6	7	27	Pounds.....	52,056,940	22,889,000	
Lampblack.....				Value.....	\$3,816,000	\$918,091	\$625,514
Other industries.....	11	12	30	Average value per 100 pounds.....	\$7.30	\$4.00	
PRODUCTS.				Bone black:			
Total value.....	\$8,462,363	\$2,971,633	\$2,160,552	Number of establishments ¹	9	7	7
The classified industries:				Pounds.....	47,506,000	44,509,000	
Carbon black (all products).....	3,934,233			Value.....	\$2,372,524	\$1,532,000	\$1,070,333
Bone black (all products).....	2,251,971	1,463,569	1,093,494	Average value per 100 pounds.....	\$5.00	\$3.45	
Lampblack (all products).....				Lampblack:			
Subsidiary products from other industries (fer-				Number of establishments ¹	5	12	32
tiziers and paints).....	2,276,159	1,508,064	1,067,058	Value ²	\$1,390,719	\$503,856	\$439,707
				All other products.....	883,120	17,686	24,998

¹ Distribution by states, 1919: Carbon black (32)—West Virginia, 16; Louisiana, 7; Pennsylvania, 2; and 1 each in Kentucky, Minnesota, Montana, New York, Oklahoma, Pennsylvania, and Wyoming. Bone black (9)—1 each in California, Florida, Illinois, Louisiana, Massachusetts, Michigan, New Jersey, Pennsylvania, and Texas. Lampblack (5)—Pennsylvania, 3; Massachusetts, 1; and New Jersey, 1.

² Includes for 1919, \$480,387 the value of 3,393,480 pounds, and \$910,332 quantity not reported; total quantity estimated 9,827,000 pounds; and for 1914, \$215,212 the value of 4,786,394 pounds, and \$288,644 quantity not reported; total quantity estimated 11,200,000 pounds.

GENERAL TABLES.

Table 32 gives for 1919, 1914, and 1909 the comparative statistics for the United States and for West Virginia.

Table 33 presents for 1919 the statistics in detail for the United States and for Louisiana and West Virginia, the only states for which detailed statistics can be given.

TABLE 32.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Cen- sus year.	Num- ber of estab- lish- ments.	Wage earners (aver- age num- ber).	Primary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.	STATE.	Cen- sus year.	Num- ber of estab- lish- ments.	Wage earners (aver- age num- ber).	Primary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.
					Expressed in thousands.								Expressed in thousands.		
United States.....	1919	35	675	1,857	\$808	\$2,848	\$6,186	All other states.....	1919	9	433	1,464	\$526	\$1,617	\$3,779
	1914	27	339	1,816	231	686	1,464		1914	19	173	800	125	299	613
	1909	27	228	1,023	149	445	1,093		1909	11	127	382	83	106	497
West Virginia.....	1919	16	242	393	282	1,231	2,407								
	1914	18	161	1,016	106	387	851								
	1909	16	101	641	66	249	596								

TABLE 33.—DETAILED STATEMENT, BY STATES: 1919.

INDUSTRY AND STATE.	Number of establishments	PERSONS ENGAGED IN THE INDUSTRY.										WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.			EXPENSES.		
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.				Total.	16 and over.		Capital.	Salaries and wages.		
					Male.	Female.	Average number.	Number, 15th day of—		Male.		Female.	Officials.		Clerks, etc.		
								Maximum month.	Minimum month.								
United States.....	35	826	30	78	32	11	675	Oct	698	Ja	658	684	682	2	\$9,790,167	\$265,813	\$46,573
Carbon black.....	29	528	29	50	22	5	422	Oct	444	Ja	403	424	424	.....	8,177,380	137,035	25,893
Bone and lamp black.....	6	298	1	28	10	6	253	Dec	200	Se	243	260	258	2	1,612,781	128,778	20,680
Louisiana.....	7	156	5	11	10	1	129	Oct	140	Ju	121	134	134	.....	2,891,015	29,221	10,050
West Virginia.....	16	298	24	23	6	3	242	Fe	258	No	229	236	236	.....	4,223,057	74,230	10,994
All other states ¹	12	372	1	44	16	7	304	.....	.....	.....	.....	314	312	2	2,676,095	102,362	24,629

INDUSTRY AND STATE.	EXPENSES—continued.						Value of products.	Value added by manufacture.	POWER.				
	Salaries and wages—Con.	For contract work.	Rent and taxes.		For materials.				Total.	Primary horsepower.			
			Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.				Total.	Owned.		
											Steam engines (not turbines).	Internal-combustion engines.	Rented (electric).
United States.....	\$808,332	\$4,500	\$3,515	\$173,671	\$1,461,364	\$1,386,695	\$6,186,204	\$3,338,145	1,857	455	911	491	
Carbon black.....	492,642	4,500	1,295	139,569	818,824	1,333,902	3,934,233	1,981,507	712	80	632	.....
Bone and lamp black.....	315,090	.....	2,220	34,102	842,540	52,793	2,251,971	1,350,638	1,145	375	279	491
Louisiana.....	134,968	.....	.....	53,589	178,377	284,816	1,002,490	539,297	240	40	200	.....
West Virginia.....	282,179	.....	875	33,672	309,020	802,124	2,407,136	1,175,992	393	40	353	.....
All other states ²	391,185	4,600	2,640	86,410	913,967	239,755	2,776,578	1,622,856	1,224	375	358	491	

¹ Same number reported for one or more other months.

² All other states embrace: Kentucky, 1 establishment; Massachusetts, 2; Montana, 1; New Jersey, 1; Oklahoma, 1; Pennsylvania, 5; and Wyoming, 1.

PETROLEUM REFINING.

GENERAL STATISTICS.

General character of the industry.—This industry embraces the establishments engaged primarily in the refining of crude petroleum by distillation. It does not include the compounders of refined or partly refined petroleum products, nor the production of gasoline from natural gas at the wells, known as casing-head gasoline. This is to a certain extent a manufacturing operation, but it is closely related to the operations of the wells and the establishments are not classed as manufacturers.

Comparative summary.—Table 1 presents general statistics for the census years 1879 to 1919, inclusive.

Principal states, ranked by value of products.—Table 2 summarizes the more important statistics for states, ranked according to value of products.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 3 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 18.

Wage earners, by months.—The statistics for wage earners, Table 4, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Females constituted but 2 per cent of the average number of wage earners in 1919. Figures are given for all states reported separately.

Prevailing hours of labor.—The figures presented in Table 5 emphasize the movement toward fewer hours of labor. In 1909, 37 per cent, and in 1914, 41.8 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were "60 or over"; whereas in 1919 but 4 per cent were in these groups. On the other hand, in 1909 only three-tenths of 1 per cent were in establishments where the pre-

vailing hours per week were fewer than 54; in 1914 this percentage had increased to 8.2 per cent, and in 1919 to 63.5 per cent.

Size of establishments, by average number of wage earners.—In 1919 the average number of wage earners for all plants was 184, as compared with 144 in 1914. Table 6 shows the growth as a whole has been largely in the higher groups. The establishments employing over 500 wage earners represented 9 per cent of the total number and reported 69 per cent of the wage earners in 1919, as compared with 8 per cent of the establishments and 62 per cent of the wage earners in 1914.

Size of establishments, by value of products.—Measured by value of products, the growth, as shown in Table 7, is largely in the higher groups, though this is to a certain extent due to the high values in 1919. The average value of products per establishment increased from \$1,612,000 in 1909 to \$2,252,000 in 1914 and to \$5,100,000 in 1919.

Character of ownership.—Table 8 presents the statistics bearing upon the matter of ownership. The industry is almost entirely under corporation control. The "Corporations" group reported approximately 99 per cent of the value of all products.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power. Of the total primary power, 45.5 per cent was utilized in the form of electric power in 1919, as compared with 30.6 per cent in 1914 and 9.8 per cent in 1909. This includes purchased electric power and secondary electric, or that generated by the establishments reporting.

Fuel consumed.—Table 10 presents the statistics for fuel, by kinds and by states. The figures for gas include both natural and manufactured gas, though chiefly natural gas.

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

	1919	1914	1909	1904	1899	1889	1879	PER CENT OF INCREASE. ¹					
								1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
Number of establishments....	320	176	147	98	67	94	86	81.8	19.7	.....	.....	.....	.....
Persons engaged.....	73,473	31,077	16,640	18,768	13,447	(²)	(²)	136.4	86.8	-11.3	39.6	.....	.....
Proprietors and firm members.....	50	52	42	24	47	(²)	(²)	.....	.....	.....	.....	.....	.....
Salaried employees.....	14,525	5,659	2,669	1,974	1,201	(²)	(²)	156.7	112.0	35.2	64.4	.....	.....
Wage earners (av. number).....	58,889	25,366	13,929	16,770	12,199	11,408	9,869	132.2	82.1	-16.9	37.5	(²)	(²)
Primary horsepower.....	238,906	128,408	90,268	46,019	36,127	32,536	(²)	86.0	42.3	96.2	27.4	11.0	.....
Capital.....	\$1,170,278,189	\$326,046,120	\$181,016,206	\$136,280,541	\$95,327,892	\$77,416,296	\$27,325,746	259.4	79.0	33.5	43.0	23.1	183.0
Salaries and wages.....	\$116,368,661	\$27,289,894	\$13,758,945	\$12,713,432	\$8,528,487	\$6,989,478	\$4,381,572	326.4	98.3	8.2	49.1	22.0	59.5
Salaries.....	\$26,619,024	\$7,892,428	\$3,928,867	\$2,724,065	\$1,811,400	(²)	(²)	237.3	100.9	44.2	50.4	.....	.....
Wages.....	\$89,749,637	\$19,397,466	\$9,830,078	\$9,989,367	\$6,717,087	(²)	(²)	362.7	97.3	-1.6	48.7	.....	.....
Paid for contract work.....	\$2,352,306	\$502,651	\$119,610	\$49,248	\$15,415	(²)	(²)	368.0	320.2	142.9	219.5	.....	.....
Rent and taxes.....	\$78,408,547	\$2,662,552	\$932,402	\$613,231	\$377,723	(²)	(²)	2,844.9	185.6	(²)	(²)	.....	.....
Cost of materials.....	\$1,247,908,365	\$325,264,509	\$199,273,402	\$139,387,213	\$102,850,341	\$67,918,723	\$34,991,101	283.7	63.2	43.0	35.5	51.4	94.1
Value of products.....	\$1,632,632,768	\$390,361,406	\$236,997,659	\$175,006,320	\$123,929,384	\$85,001,198	\$43,705,218	311.9	67.2	35.4	41.2	45.8	94.5
Value added by manufacture ³	\$384,624,411	\$71,096,897	\$37,724,267	\$35,618,107	\$21,070,043	\$17,082,475	\$8,706,117	441.0	88.5	5.9	69.0	23.4	96.2
Crude petroleum used (barrels).....	365,271,803	191,262,724	120,775,439	66,982,862	52,011,005	30,662,620	17,417,455	91.0	58.4	80.3	28.8	69.6	76.0

¹ A minus sign (—) denotes decrease; percentages are omitted where base is less than 100.

² Figures not available.

³ Figures not strictly comparable.

⁴ Exclusive of internal revenue.

⁵ Value of products less cost of materials.

MANUFACTURES.

TABLE 2.—PRINCIPAL 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.	Amount (expressed in thousands).	Per cent distribution.			Average number.	Per cent distribution.	Rank.	Amount (expressed in thousands).	Per cent distribution.	Amount (expressed in thousands).	Per cent distribution.
United States.....	320	58,889	100.0	....	\$1,632,533	100.0	\$384,625	100.0	Louisiana.....	10	2,841	4.8	8	\$75,024	4.6	\$25,420	6.6
New Jersey.....	9	10,178	17.3	1	280,905	17.2	58,108	15.1	Illinois.....	13	2,448	4.2	9	64,640	4.0	10,495	2.7
Texas.....	39	8,224	14.0	3	241,757	14.8	48,879	12.7	Kansas.....	20	2,221	3.8	11	63,786	3.9	12,450	3.2
California.....	45	5,132	8.7	4	213,292	13.1	71,416	18.6	Ohio.....	11	2,431	4.1	10	43,283	2.6	11,325	2.9
Pennsylvania.....	53	8,235	14.0	2	178,825	11.0	43,844	11.4	Missouri.....	4	930	1.6	13	24,610	1.5	3,495	0.9
Oklahoma.....	66	4,612	7.8	5	150,673	9.2	23,524	6.1	All other states..	41	11,637	19.7	....	295,738	18.1	75,660	19.8

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.		CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.	
					Male.	Female.						Male.	Female.
All classes.....	1919	73,473	69,511	3,962	94.8	5.2	Clerks and other subordinate salaried employees.	1919	11,777	9,031	2,746	76.7	23.3
	1914	31,077	30,622	455	98.5	1.5		1914	4,872	4,532	290	94.0	6.0
	1909	16,640	16,251	389	97.7	2.3		1909	2,040	1,820	220	89.2	10.8
Proprietors and officials.....	1919	2,807	2,778	29	99.0	1.0	Wage earners (average number).....	1919	58,889	57,702	1,187	98.0	2.0
	1914	839	833	6	99.3	0.7		1914	25,366	25,207	159	99.4	0.6
	1909	671	661	10	98.5	1.5		1909	13,929	13,770	159	98.9	1.1
Proprietors and firm members...	1919	59	55	4	93.2	6.8	16 years of age and over.....	1919	58,849	57,662	1,187	98.0	2.0
	1914	52	47	5	90.4	9.6		1914	25,326	25,167	159	99.4	0.6
	1909	42	37	5	88.1	11.9		1909	13,886	13,727	159	98.9	1.1
Salaried officers of corporations...	1919	510	494	16	96.9	3.1	Under 16 years of age.....	1919	40	40	.....	100.0	.....
	1914	251	250	1	99.6	0.4		1914	40	40	.....	100.0	.....
	1909	211	207	4	98.1	1.9		1909	43	43	.....	100.0	.....
Superintendents and managers...	1919	2,238	2,229	9	99.6	0.4							
	1914	536	536	.....	100.0	.....						
	1909	418	417	1	99.8	0.2							

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

[The month of maximum employment 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:														
1919.....	58,889	54,542	54,883	54,822	55,935	57,705	59,018	61,079	60,550	61,489	62,507	61,739	62,599	83.8
Males.....	57,702	52,750	53,499	53,620	54,823	56,603	57,918	59,016	59,413	60,323	61,465	60,621	61,478	85.8
Females.....	1,187	<i>1,592</i>	1,384	1,202	1,112	1,102	1,105	1,163	1,137	1,166	<i>1,042</i>	1,118	1,121	65.5
1914.....	25,366	25,068	25,053	25,833	25,565	25,138	25,572	25,849	24,946	25,516	25,773	25,211	24,868	96.2
1909.....	13,929	13,319	13,079	<i>12,968</i>	13,076	13,206	13,617	14,156	14,221	14,434	15,032	15,249	14,805	84.9
California.....	5,132	5,066	4,894	4,768	4,737	4,785	5,024	5,222	5,386	5,399	5,295	5,417	5,606	84.5
Illinois.....	2,448	2,354	2,377	2,477	2,424	2,380	2,416	2,488	2,439	2,374	2,524	2,589	2,534	90.0
Kansas.....	2,221	2,273	2,276	2,222	2,190	2,382	2,160	2,220	2,152	2,242	<i>2,098</i>	2,183	2,274	88.6
Louisiana.....	2,841	2,092	2,474	2,600	2,733	2,859	2,899	2,955	2,933	2,904	3,075	3,182	3,356	61.4
Missouri.....	930	825	799	817	947	1,008	1,111	1,254	<i>262</i>	975	955	1,096	1,061	20.1
New Jersey.....	10,178	9,330	9,218	<i>9,025</i>	9,193	9,901	10,322	10,620	10,772	10,708	11,301	10,992	10,740	79.9
Ohio.....	2,431	2,416	2,431	2,351	<i>2,331</i>	2,356	2,389	2,524	2,556	2,405	2,477	2,440	2,397	91.2
Oklahoma.....	4,612	4,482	4,580	4,421	4,464	4,560	4,573	4,677	4,823	4,770	4,690	4,714	4,781	90.8
Pennsylvania.....	8,285	8,134	8,220	<i>8,017</i>	8,157	8,158	8,404	8,512	8,405	8,353	8,254	8,168	8,038	94.2
Texas.....	8,224	6,724	7,323	7,648	7,553	8,100	7,867	8,511	8,870	8,854	8,940	8,018	9,280	72.5

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

STATE.	Cen- sus year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							STATE.	Cen- sus year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—						
			44 and under.	Be- tween 44 and 48.	48. ¹	Be- tween 48 and 54.	54.	Be- tween 54 and 60.	60.				44 and under.	Be- tween 44 and 48.	48. ¹	Be- tween 48 and 54.	54.	Be- tween 54 and 60.	60.
United States..	1919	58,889	205	701	31,059	5,444	4,907	14,251	572	1,750	New Jersey.....	1919	10,178	81	701	9,213	183	.....	.....
	1914	25,366	(2)	(2)	1,241	848	12,621	56	2,502	8,038		1914	5,178	.....	.....	4,992	.....	180	.....
	1909	18,929	(2)	(2)	43	.....	8,670	61	1,894	3,261									
California.....	1919	5,132	8	.....	3,417	118	27	1,562	.....	367	Ohio.....	1919	2,431	.....	604	1,029	186	270	212
	1914	1,930	(2)	(2)	1,239	20	261	41	2	.....		1914	1,519	.....	828	400	123	162	.....
Illinois.....	1919	2,448	.....	.....	312	1,568	.....	541	15	12	Oklahoma.....	1919	4,612	.....	2,006	.....	112	1,766	314
	1914	1,072	.....	.....	.....	249	.....	302	521	.....		1914	516	.....	1	76	14	64	361
Kansas.....	1919	2,221	.....	.....	1,200	.....	.....	954	36	31	Pennsylvania.....	1919	8,235	116	.....	7	93	4,502	35
	1914	800	.....	.....	.....	.....	.....	278	612	.....		1914	4,902	.....	.....	3,067	1	575	1,259
Louisiana ²	1919	2,841	.....	.....	2,455	.....	.....	348	.....	38	Texas.....	1919	8,224	.....	6,388	1,289	4	396	40
Missouri ²	1919	930	.....	.....	.....	892	.....	21	8	9		1914	2,909	.....	.....	1,960	.....	8	941

¹ Includes 48 and under for 1914 and 1909.

² Corresponding figures not available.

³ Not reported separately in 1914.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR 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....1919..	320	58,889	2	46	152	90	1,051	59	2,019	44	3,258	32	5,347	19	6,517	13	9,003	15	31,542	
.....1914..	176	25,366	.....	25	80	57	695	42	1,410	13	831	12	1,990	13	4,093	8	5,729	6	9,938
California.....	45	5,132	1	11	36	14	157	9	266	4	319	1	109	3	1,194	1	657	1	2,394	
Illinois.....	13	2,448	.....	1	5	4	56	.....	3	237	2	302	1	280	2	1,568	.....	.....	.....
Kansas.....	20	2,221	.....	4	15	12	146	5	173	2	130	2	252	3	893	1	636	.....	.....
Louisiana.....	10	2,841	.....	.....	6	71	1	42	1	93	1	196	.....	.....	.....	1	892	1	2,439
Missouri.....	4	930	.....	.....	3	38	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey.....	9	10,178	.....	.....	.....	.....	.....	.....	.....	3	264	.....	.....	.....	.....	2	1,234	4	5,680
Ohio.....	11	2,431	1	.....	2	13	2	93	.....	.....	4	698	.....	.....	.....	1	698	1	1,029
Oklahoma.....	66	4,612	.....	7	22	24	275	18	651	5	394	10	1,776	1	291	.....	.....	1	1,203
Pennsylvania.....	53	8,235	.....	5	14	10	120	16	526	14	936	3	484	3	1,307	1	715	1	4,133
Texas.....	30	8,224	.....	11	36	8	80	5	167	8	599	2	271	1	264	1	520	3	6,287

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.....	320	176	147	58,889	25,366	13,929	\$1,632,532,766	\$396,361,406	\$236,997,659	\$384,624,411	\$71,096,897	\$37,724,257
Less than \$5,000.....	4	.....	.....	2	.....	.....	10,996	.....	.....	1,843	.....	.....
\$5,000 to \$20,000 ¹	10	10	16	20	17	57	64,720	87,594	206,158	16,269	28,038	62,811
\$20,000 to \$100,000.....	21	27	25	107	205	221	1,383,278	1,669,133	1,524,305	259,137	420,474	299,158
\$100,000 to \$500,000.....	65	59	71	680	2,166	2,015	17,482,094	16,107,841	26,695,548	2,122,261	6,440,389	6,088,243
\$500,000 to \$1,000,000.....	56	26	.....	1,640	.....	.....	39,503,729	17,176,014	.....	8,386,356	.....	.....
\$1,000,000 and over.....	108	54	35	50,440	22,978	11,636	1,574,107,949	361,321,824	208,671,648	878,838,645	64,105,096	31,274,045
PER CENT DISTRIBUTION.												
All classes.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.1	100.1
Less than \$5,000.....	1.3	.....	.....	(2)	.....	.....	(2)	.....	.....	(2)	.....	.....
\$5,000 to \$20,000 ¹	1.9	5.7	10.0	(2)	0.1	0.4	(2)	(2)	0.1	(2)	(2)	0.2
\$20,000 to \$100,000.....	6.6	15.3	17.0	0.2	0.8	1.6	0.1	0.4	0.6	0.1	0.6	0.8
\$100,000 to \$500,000.....	20.3	33.5	48.3	1.2	8.5	14.5	1.1	4.1	11.2	0.6	9.1	16.1
\$500,000 to \$1,000,000.....	17.5	14.8	.....	2.8	.....	.....	2.4	4.3	.....	2.2	.....	.....
\$1,000,000 and over.....	52.5	30.7	23.8	95.8	90.6	83.5	96.4	91.2	88.0	97.2	90.3	82.9

¹ Includes the group "Less than \$5,000" for 1914 and 1909.

² Less than one-tenth of 1 per cent.

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

STATE.	Cen- sus year.	NUMBER OF ESTABLISH- MENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.									VALUE OF PRODUCTS.								
		Indi- vid- uals.	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- uals.	Cor- pora- tions.	All oth- ers.	Indi- vid- uals.	Cor- pora- tions.	All oth- ers.		Individ- uals.	Corpora- tions.	All others.	Indi- vid- uals.	Corpora- tions.	All oth- ers.				
United States....	1919	8	297	15	58,889	196	58,521	172	0.3	99.4	0.3	\$1,632,532,766	\$9,466,587	\$1,617,693,917	\$5,372,262	0.6	99.1	0.3				
	1914	6	155	15	25,366	137	24,944	15	0.6	98.3	1.1	396,361,406	2,442,105	389,378,595	4,540,706	0.6	98.2	1.2				
	1900	4	131	12	13,929	99	13,678	12	0.7	98.2	1.1	236,997,650	1,992,431	232,539,969	2,535,259	0.8	98.1	1.1				
California.....	1919	1	44	.....	5,132	.....	15,132	.....	.....	.....	.....	213,292,194	.....	213,292,194	.....	.....	100.0	.....			
	1914	2	32	4	1,930	.....	1,907	123	.....	98.8	1.2	55,527,651	.....	54,917,623	1610,028	.....	98.9	1.1
Illinois ²	1919	.....	12	1	2,448	.....	2,448	.....	.....	.....	.....	64,548,642	.....	64,548,642	.....	.....	100.0	.....			
Kansas ²	1919	.....	28	1	2,221	.....	2,221	.....	.....	.....	.....	63,785,520	.....	63,785,520	.....	.....	100.0	.....			
Louisiana ²	1919	.....	10	.....	2,841	.....	2,841	.....	100.0	.....	.....	75,023,726	.....	75,023,726	.....	.....	100.0	.....			
Missouri ²	1919	.....	4	.....	930	.....	930	.....	100.0	.....	.....	24,610,532	.....	24,610,532	.....	.....	100.0	.....			
New Jersey ²	1919	.....	9	.....	10,178	.....	10,178	.....	100.0	.....	.....	280,994,553	.....	280,994,553	.....	.....	100.0	.....			
Ohio.....	1919	.....	11	.....	2,431	.....	2,431	.....	100.0	.....	.....	43,282,801	.....	43,282,801	.....	.....	100.0	.....			
	1914	.....	7	.....	1,519	.....	1,519	.....	100.0	.....	.....	11,169,189	.....	11,169,189	.....	.....	100.0	.....			
Oklahoma.....	1919	1	65	.....	4,612	.....	14,612	.....	.....	.....	.....	150,673,458	.....	150,673,458	.....	.....	100.0	.....			
	1914	.....	23	.....	516	.....	516	.....	100.0	.....	.....	13,014,372	.....	13,014,372	.....	.....	100.0	.....			
Pennsylvania.....	1919	6	41	6	8,235	164	7,993	78	2.0	97.1	0.9	178,825,632	5,798,115	169,785,472	3,244,045	3.2	95.0	1.8				
	1914	4	34	10	4,902	123	4,528	251	2.5	92.4	5.1	52,876,101	2,204,024	46,654,960	4,016,117	4.2	88.2	7.6				
Texas ²	1919	.....	35	4	8,224	.....	8,168	56	.....	99.3	0.7	241,757,313	.....	240,830,554	926,759	.....	99.6	0.4

¹ Includes the group "Individuals."² Figures for 1914 not available.³ 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.....	6,703	2,499	2,142	238,006	128,468	90,268	100.0	100.0	100.0
Owned.....	3,127	2,130	2,138	187,521	113,837	89,955	78.5	88.6	99.7
Steam ¹	2,460	1,818	2,039	144,743	94,052	84,085	60.6	73.2	93.2
Engines.....	2,256	(²)	(²)	95,020	(²)	(²)	39.8	(²)	(²)
Turbines.....	204			49,723			20.8		
Internal-combustion engines.....	647	300	99	42,647	18,208	5,870	17.9	14.2	6.5
Water wheels, turbines, and motors.....	20	12		131	1,487		(³)	1.2	
Rented.....	3,576	369	4	51,385	14,631	313	21.5	11.4	0.3
Electric.....	3,576	369	4	51,385	14,353	28	21.5	11.2	(³)
Other.....					278	285		0.2	
Electric.....	6,665	1,464	511	108,925	35,614	8,808	100.0	100.0	100.0
Rented.....	3,576	369	4	51,385	14,353	28	47.3	37.2	0.3
Generated by establishments reporting.....	3,089	1,095	507	57,240	24,261	8,780	52.7	62.8	99.7

¹ Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.² Figures not shown separately in 1914 and 1909.³ Less than one-tenth of 1 per cent.

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TABLE 10.—FUEL CONSUMED, BY STATES: 1919 AND 1914.

STATE.	Cen- sus year.	COAL.		Coke (tons, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
		Anthracite (tons, 2,240 pounds).	Bituminous (tons, 2,000 pounds).				
United States.....	1919	1,105,503	3,619,534	319,563	23,649,032	67,489	26,910,052
	1914	1,367,429	2,045,485	157,621	7,455,918	(1)	10,993,746
California.....	1919				3,113,080	305	3,378,968
	1914			22,030	2,471,640	(1)	896,940
Illinois.....	1919		533,215	3,102	809,885	11	
	1914	890	290,899	3,630	259,939	(1)	419,966
Kansas.....	1919		58,352		1,555,484		3,102,277
	1914		2,330	66	436,949	(1)	1,398,469
Louisiana ¹	1919			58,440	278,346		1,910,816
Missouri ²	1919		109,703	3,310	661,115		
New Jersey.....	1919	632,960	174,163	127,258	3,680,753	7,275	17,198
	1914	953,100	69,587	36,701	78,641	(1)	267,781
Ohio.....	1919	30,198	418,777	1,969	52,248	31	137,170
	1914		244,739	3,433	15,989	(1)	188,311
Oklahoma.....	1919		91,798	482	2,632,184	573	11,847,807
	1914		2,762		143,282	(1)	2,976,649
Pennsylvania.....	1919	254,896	711,590	32,008	1,662,660	344	2,602,740
	1914	302,994	587,025	23,696	83,561	(1)	3,484,065
Texas.....	1919			14,203	6,203,637	1,902	954,618
	1914		11,632	10,701	2,437,135	(1)	
All other states.....	1919	178,449	1,521,946	78,701	2,998,740	57,048	2,997,458
	1914	110,439	836,511	57,364	1,528,782	(1)	1,361,565

¹ Included in figures for fuel oils.

² Included with "All other states" in 1914.

SPECIAL STATISTICS.

Materials.—Table 11 presents detailed statistics of materials for 1919 in comparison with 1914, 1909, and 1904; and Table 12 gives the statistics for crude petroleum consumption, by fields, for 1919 and 1914.

Table 13 assembles the statistics for the marketed production of crude petroleum and the consumption by the refineries in 1919 and 1914, distributed by fields.

Products.—Table 14 gives, with as much detail as the returns permit, the statistics for products, quantities, and values for the four census years. The aggregate value of all products of the refineries in 1919 was an increase of 312 per cent over the total for 1914. In addition to the gasoline product of the refineries, there was a large production of casing-head

gasoline, the output as reported by the Geological Survey for 1919 being 340,647,000 gallons, valued at \$63,608,900, as compared with 42,652,632 gallons in 1914, valued at \$3,105,900. The annual growth in casing-head gasoline has been heavy since it was first reported in 1911, 426,000 gallons.

Equipment.—Table 15 presents the statistics for the equipment of the refineries in stills, agitators, chilling houses, filter houses, and presses, and also storage tanks, for 1919 and 1914.

Distribution of establishments.—Table 16 shows the distribution of the establishments, by states, grouped by geographic divisions, and also the number of establishments reporting the several classes of products.

TABLE 11.—DETAILED STATISTICS OF QUANTITY AND COST OF MATERIALS: 1919, 1914, 1909, AND 1904.

	1919	1914	1909	1904		1919	1914	1909	1904
Total cost.....	\$1,247,908,355	\$325,264,509	\$199,273,402	\$139,387,213	Sulphur:				
Crude petroleum used:					Tons (2,000 pounds).....	5,241			
Barrels (42 gallons).....	365,271,803	191,262,724	120,775,439	66,982,862	Cost.....	\$130,828			
Cost.....	\$867,646,475	\$249,727,856	\$152,807,040	\$107,487,091	Pyrites:		\$206,053		
Average unit cost, barrel.....	\$2.38	\$1.31	\$1.26	\$1.60	Tons.....	26,275			
Distillates purchased and re-run:					Cost.....	\$224,700			
Barrels.....	43,074,982	9,455,300	(¹)	(¹)	Sulphuric acid (purchased): ²			\$4,003,198	\$2,304,635
Cost.....	\$151,824,598	\$24,395,541			Tons.....	503,920	290,455		
Casing-head gasoline, purchased:					Cost.....	\$10,327,060	\$3,519,552		
Barrels.....	6,952,215	(¹)	(¹)	(¹)	Caustic soda:				
Cost.....	\$59,857,628				Pounds.....	45,270,896	22,216,000		
Casing-head gas (wet natural gas):					Cost.....	\$1,736,870	\$361,421		
Thousand cubic feet.....	16,671,322	(¹)	(¹)	(¹)	Other chemicals, cost.....	\$663,660	(¹)	(¹)	(¹)
Cost.....	\$1,256,834				Fuller's earth, cost.....	\$2,375,729	(¹)	(¹)	(¹)
					Containers, and materials therefor:				
					Wooden, cost.....	\$34,801,732	\$12,944,471	\$3,937,421	
					Metal, cost.....	\$26,193,075	\$7,292,207	\$8,037,407	\$17,870,348
					Fuel and rent of power, cost ..	\$53,505,109	\$13,567,284	\$3,376,383	\$5,139,034
					All other materials, cost.....	\$37,358,257	\$13,250,124	\$17,611,893	\$6,585,205

¹ Figures not available.² In addition, there was made and consumed in 1919, 18,140 tons, and in 1914, 38,440 tons.

TABLE 12.—CRUDE PETROLEUM, CONSUMPTION, BY FIELDS: 1919 AND 1914.

FIELD.	1919			1914			AVERAGE COST PER BARREL.	
	Quantity.		Cost.	Quantity.		Cost.	1919	1914
	Barrels (42 gallons).	Per cent of total.		Barrels (42 gallons).	Per cent of total.			
Total.....	365,271,803	100.0	\$869,745,304	191,262,724	100.0	\$249,727,856	\$2.38	\$1.31
Mid-Continent.....	181,039,564	49.6	496,405,420	92,462,637	48.3	121,188,411	2.74	1.31
California.....	74,200,751	20.3	109,655,774	41,901,651	21.9	30,157,013	1.48	0.72
Appalachian (Pennsylvania grade).....	29,828,701	8.2	126,127,716	21,196,964	11.1	50,019,939	4.23	2.36
Illinois.....	10,888,115	2.9	33,127,519	17,072,279	9.2	30,137,986	3.04	1.71
Gulf.....	16,390,712	4.5	28,906,651	5,787,313	3.0	6,080,907	1.76	1.05
Lima-Indiana.....	1,737,865	0.5	5,031,639	2,564,742	1.3	4,286,588	2.90	1.67
Colorado and Wyoming.....	12,772,958	3.5	21,530,593	3,441,893	1.8	2,088,700	1.69	0.61
Other United States.....	93,626		135,452				2.13	
Foreign:								
Mexican.....	38,295,267	10.5	48,738,033	6,235,245	3.3	5,768,282	1.27	0.93
Other.....	48,244		86,607					

TABLE 13.—CRUDE PETROLEUM, DOMESTIC PRODUCTION AND REFINERY CONSUMPTION, BY FIELDS: 1919 AND 1914.

FIELD.	Census year.	Marketed production (barrels).	Consumption by refineries (barrels).	Per cent consumption is of production.	FIELD.	Census year.	Marketed production (barrels).	Consumption by refineries (barrels).	Per cent consumption is of production.
United States.....	1919 1914	377,719,000 265,762,535	326,923,292 185,027,479	86.0 69.6	Illinois.....	1919 1914	12,436,000 21,919,749	10,888,115 17,672,279	87.6 80.6
Mid-Continent.....	1919 1914	196,891,000 97,995,400	181,039,564 92,462,637	91.9 94.4	Gulf.....	1919 1914	20,568,000 13,117,623	16,396,712 5,787,313	79.7 44.1
California.....	1919 1914	101,564,000 60,775,327	74,200,751 41,901,651	73.1 42.0	Lima-Indiana.....	1919 1914	3,444,000 5,062,543	1,737,865 2,564,742	50.5 50.7
Appalachian (Pennsylvania grade)...	1919 1914	29,232,000 24,101,048	29,828,701 21,196,964	(¹) 88.0	Other fields—Colorado, Wyoming, etc.	1919 1914	13,584,000 3,790,940	12,836,584 3,441,893	94.8 90.8

¹ Consumption in excess of production.

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TABLE 14.—DETAILED STATISTICS OF QUANTITY AND VALUE OF PRODUCTS: 1919, 1914, 1909, AND 1904.

	1919	1914	1909	1904		1919	1914	1909	1904
Total value.....	\$1,632,532,766	\$396,361,406	\$236,997,659	\$175,005,320	Lubricating oils—Continued.				
Naphthas and lighter products:					Cylinder oils—				
Gasoline—					Gallons.....	235,345,952	102,949,100	79,378,950	68,333,050
Gallons.....	3,648,590,635	1,195,412,100			Value.....	\$59,036,506	\$13,703,772	\$9,482,568	\$9,332,290
Value.....	\$879,867,064	\$106,140,170			All other lubricating oils, including compounded (except cylinder) oils.—				
Naphtha—					Gallons.....	249,504,130	205,115,100	265,209,600	139,157,400
Gallons.....	392,282,320		540,327,500	290,546,450	Value.....	\$64,384,536	\$21,597,675	\$17,671,709	\$6,068,360
Value.....	\$65,077,864		\$39,771,959	\$21,314,837	Liquid asphaltic road oils:				
Benzine—					Gallons.....	98,036,511			
Gallons.....	67,491,006	264,626,100			Value.....	\$4,491,888			
Value.....	\$10,015,853	\$15,770,137			Residuum or tar:				
Other—					Gallons.....	29,163,394	134,844,350	89,350,400	150,896,050
Gallons.....	97,262,837				Value.....	\$1,522,797	\$4,017,858	\$2,215,623	\$3,138,361
Value.....	\$11,045,284				Greases:				
Illuminating oils:					Gallons.....	28,147,534	14,006,400	6,915,100	10,121,950
Gallons.....	2,305,489,735	1,935,274,800	1,674,789,900	1,356,754,700	Value.....	\$11,896,655	\$3,536,491	\$1,567,647	\$1,394,130
Value.....	\$235,063,055	\$96,806,452	\$94,547,010	\$91,366,434	Petrolatum—				
Fuel oils:					Gallons.....	10,230,287	6,078,050	(1)	(1)
Gallons.....	7,767,900,556	3,734,092,050	1,701,728,850	360,471,400	Value.....	\$3,750,028	\$1,243,388	(1)	(1)
Value.....	\$318,124,339	\$84,017,916	\$36,462,883	\$0,205,391	Lubricating greases—				
Distillates—					Gallons.....	12,599,628	4,980,150	(1)	(1)
Gallons.....	646,652,618	457,491,650	(1)	(1)	Value.....	\$6,043,741	\$1,624,949	(1)	(1)
Value.....	\$36,548,107	\$15,999,342	(1)	(1)	Axle grease—				
Gas oils—					Gallons.....	5,817,619	2,948,200	(1)	(1)
Gallons.....	1,393,623,496	755,558,400	(1)	(1)	Value.....	\$2,102,886	\$668,154	(1)	(1)
Value.....	\$76,383,453	\$22,805,340	(1)	(1)	Paraffin wax:				
Residual fuel oil—					Gallons.....	67,976,676	57,538,800	47,341,500	39,703,400
Gallons.....	5,727,024,452	2,521,042,000	(1)	(1)	Value.....	\$28,348,437	\$8,897,106	\$9,388,812	\$10,007,274
Value.....	\$205,192,779	\$45,213,234	(1)	(1)	Acid oil:				
Partly refined oils, sold for rerunning:					Gallons.....	45,600,039	(1)	(1)	(1)
Gallons.....	428,346,637	(1)	(1)	(1)	Value.....	\$992,907	(1)	(1)	(1)
Above fuel oil.....	79,895,749				Asphalt, other than liquid asphalt:				
Fuel oil.....	109,503,858				Tons.....	927,151	405,157	233,328	(1)
Below fuel oil.....	238,747,030				Value.....	\$12,500,157	\$4,867,213	\$2,724,752	(1)
Value.....	\$29,268,849				Coke:				
Lubricating oils:					Tons.....	798,180	213,777	(1)	(1)
Gallons.....	821,580,400	517,838,800	537,294,250	314,912,550	Value.....	\$3,928,345	\$818,889	\$507,695	\$149,653
Value.....	\$196,242,439	\$55,812,120	\$38,884,236	\$23,553,091	Reclaimed or separated acid sold:				
Pale or paraffin; viscosity less than 100° Universal; or flash under 400° F.; closed cup—					Tons.....	136,320	89,792	133,215	165,104
Gallons.....	124,372,754	93,422,100	161,961,500	82,220,000	Value.....	\$687,302	\$491,380	\$402,295	\$400,430
Value.....	\$28,238,302	\$8,084,650	\$9,473,975	\$6,210,279	Candles, value.....	\$2,939,519	\$1,402,945		
Red or neutral; viscosity 100° Universal or higher; or flash 400° F. or over; closed cup (not including cylinder oils)—					Other special products, value.....	\$6,813,647	\$10,524,747		
Gallons.....	212,357,504	110,352,500	30,744,200	25,202,100	All other products, value.....	\$13,106,875	\$5,265,736		
Value.....	\$44,583,005	\$12,426,023	\$2,255,924	\$1,942,153					

1 Figures not available.

TABLE 15.—EQUIPMENT: 1919 AND 1914.

KIND.	1919	1914	KIND.	1919	1914
Still, number.....	6,935	3,639	Filter houses:		
Capacity (gallons).....	174,295,000	(1)	Number.....	357	(1)
Steam—			Capacity (gallons).....	11,381,452	(1)
Number.....	1,061	612	Hydraulic or other presses:		
Capacity (gallons).....	27,560,000	17,892,000	Number.....	645	459
Fire—			Capacity (gallons).....	6,258,924	(1)
Number.....	4,394	3,027	Storage tanks for:		
Capacity (gallons).....	130,115,000	84,882,000	Crude petroleum—		
Pressure—			Number.....	2,183	1,014
Number.....	1,480	(1)	Capacity (gallons).....	1,511,889,000	580,202,000
Capacity (gallons).....	16,630,000	(1)	Refined petroleum products—		
Agitators:			Number.....	11,380	6,967
Number.....	1,083	770	Capacity (gallons).....	2,152,820,000	1,042,836,000
Capacity (gallons).....	62,427,181	(1)	Fuel oil—		
Chilling houses for paraffin:			Number.....	1,822	807
Number.....	105	76	Capacity (gallons).....	1,069,813,000	343,132,000
Capacity (gallons).....	4,712,000	(1)	Other—		
			Number.....	5,540	4,111
			Capacity (gallons).....	655,346,000	640,608,000

1 Figures not available.

MANUFACTURES.

TABLE 16.—ESTABLISHMENTS, DISTRIBUTED BY PRODUCTS, FOR STATES, GROUPED BY GEOGRAPHIC DIVISIONS: 1919.

	UNITED STATES.	NEW ENGLAND.	MIDDLE ATLANTIC.			EAST NORTH CENTRAL.			WEST NORTH CENTRAL.		
		Rhode Island.	New York.	New Jersey.	Pennsylvania.	Ohio.	Indiana.	Illinois.	Minnesota.	Missouri.	Kansas.
Number of petroleum refineries..	320	1	6	9	53	11	3	13	1	4	29
Naphthas and lighter products:											
Gasoline.....	279		4	7	49	11	3	11	1	4	29
Naphtha.....	97		1	3	21	5		3		1	10
Benzine.....	39		1	2	9	1	1	3			1
All other.....	22		1	3	1			1			
Illuminating oils.....	241		4	6	46	8	3	10	1	4	29
Fuel oils:											
Distillates.....	137		1	3	25	4	1	3	1	1	11
Gas oils.....	161		4	5	16	5	2	9	1	3	16
Residual fuel oil.....	245	1	2	5	19	6	3	10	1	4	28
Partly refined oils sold for rerunning.....	43	1		1	17	1		1			
Lubricating oils:											
Pale or paraffin.....	56		2	3	17	7	1	3			4
Red or neutral.....	66		2	4	21	4	2	3		1	5
Cylinder.....	88		4	5	36	2	1	3	1		7
All other.....	66		2	4	20	7	1	2		1	4
Liquid asphaltic road oils.....	42	1	1	3	2	1	2	3		1	5
Greases:											
Petrolatum.....	21		1	3	16		1				
Lubricating greases.....	24		1	2	2	3	1	1	1		1
Axle grease.....	18		1	1	1	2	1	1	1		1

	SOUTH ATLANTIC.				EAST SOUTH CENTRAL.		WEST SOUTH CENTRAL.				MOUNTAIN.				PACIFIC.
	Delaware.	Maryland.	Virginia.	West Virginia.	Kentucky.	Tennessee.	Arkansas.	Louisiana.	Oklahoma.	Texas.	Idaho.	Wyoming.	Colorado.	Utah.	California.
Number of petroleum refineries..	1	4	1	5	3	1	1	10	66	39	1	7	5	1	45
Naphthas and lighter products:															
Gasoline.....		3		5	3	1	1	8	63	34	1	6	3	1	31
Naphtha.....				3			1	1	28	9					11
Benzine.....				1				1	8	7					4
All other.....		1							2				1		10
Illuminating oils.....		2		4	2	1	1	8	57	30		1	3	1	16
Fuel oils:															
Distillates.....		3		2	1		1	2	25	16	1	2	2	1	31
Gas oils.....	1	2		2			1	5	47	16	1	2	3	1	19
Residual fuel oil.....	1	3	1		2	1	1	9	62	36	1	6	2	1	40
Partly refined oils sold for rerunning.....	1	2	1	3					6	5		2			2
Lubricating oils:															
Pale or paraffin.....		1		2				1	4	5					6
Red or neutral.....		2		2				2	5	5			2	1	5
Cylinder.....		1		5			1	1	11	6			1		3
All other.....		2		1				2	7	5			1		7
Liquid asphaltic road oils.....	1	3	1				3		4	4		1			4
Greases:															
Petrolatum.....															
Lubricating greases.....		1						1	3	2			1	1	3
Axle grease.....		1						1		3			1	1	3

GENERAL TABLES.

Table 17 gives comparative statistics for the principal items, number of establishments, average number of wage earners, primary horsepower, wages, cost of

materials, and value of products for the census years 1919, 1914, and 1909. Table 18 is a detailed statement, by states, for the census of 1919.

TABLE 17.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Cen- sus year.	Num- ber of estab- lish- ments	Wage earn- ers (aver- age num- ber).	Primary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.	STATE.	Cen- sus year.	Num- ber of estab- lish- ments	Wage earn- ers (aver- age num- ber).	Primary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.
					Expressed in thousands.								Expressed in thousands.		
United States.....	1919	320	58,889	238,906	\$89,750	\$1,247,008	\$1,632,533	Ohio.....	1919	11	2,431	7,383	\$3,246	\$31,958	\$43,283
	1914	176	25,366	128,468	19,397	325,265	398,861		1914	7	1,519	4,920	1,025	9,924	11,160
	1909	147	13,929	90,268	9,890	190,273	236,998		1909	10	1,669	4,324	1,028	8,145	10,754
California.....	1919	45	5,132	60,307	8,179	141,877	213,292	Oklahoma.....	1919	66	4,612	24,477	5,910	127,150	150,678
	1914	38	1,930	22,309	1,716	38,170	55,528		1914	23	516	3,304	432	9,591	13,014
	1909	29	930	5,630	801	13,898	17,878		1909	9	75	231	54	575	1,055
Illinois.....	1919	13	2,448	5,106	3,484	54,053	64,549	Pennsylvania.....	1919	53	8,235	22,606	11,960	134,981	178,826
	1914	9	1,072	2,607	899	12,408	16,893		1914	48	4,902	37,522	3,219	44,384	52,875
									1909	41	2,900	35,212	1,861	47,440	53,088
Kansas.....	1919	29	2,221	10,950	3,065	51,336	63,786	All other states.....	1919	94	23,632	72,037	35,882	483,667	637,130
	1914	13	890	4,423	752	7,185	8,923		1914	30	9,359	26,885	7,353	124,211	147,082
	1909	18	324	1,150	186	2,817	4,077		1909	40	8,041	43,721	5,900	126,398	150,148
New Jersey.....	1919	9	10,178	36,040	18,024	222,886	280,994								
	1914	8	5,178	26,498	4,001	79,392	90,877								

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TABLE 18.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.								WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.				EXPENSES.				
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.	Capital.	Salaries and wages.			
					Male.	Female.	Average number.	Number, 15th day of—			Male.	Female.			Male.	Officials.	Clerks, etc.	
								Maximum month.	Minimum month.									
United States...	320	73,473	59	2,748	9,031	2,746	58,889	De	62,599	Ja	54,342	62,060	61,492	1,126	42	\$1,170,278,189	\$11,315,491	\$15,303,533
California.....	45	6,530	1	400	782	215	5,132	De	5,606	Ap	4,737	5,564	5,451	113	.....	84,015,443	1,430,958	1,428,010
Illinois.....	13	2,932	2	84	313	85	2,448	No	2,589	Ja	2,354	2,558	2,507	51	.....	36,342,555	390,500	677,877
Kansas.....	29	2,654	2	150	190	91	2,221	My	2,362	Oc	2,092	2,402	2,401	.....	1	51,629,201	615,527	390,015
Louisiana.....	10	3,143	.....	37	231	34	2,841	De	3,356	Ja	2,062	3,356	3,342	14	.....	40,851,980	249,884	543,493
Missouri.....	4	1,070	.....	48	81	11	930	Jy	1,254	Aug	252	1,061	1,059	2	.....	13,399,315	151,866	115,986
New Jersey.....	9	11,991	.....	458	1,070	285	10,178	Oc	11,301	Mh	9,025	10,757	10,575	153	29	203,292,144	1,816,366	1,929,267
Ohio.....	11	4,890	.....	70	2,044	345	2,431	Aug	2,556	Ap	2,331	2,400	2,372	28	.....	46,545,550	359,868	2,441,744
Oklahoma.....	66	6,213	1	313	957	330	4,612	Aug	4,823	Fe	4,380	4,797	4,787	2	8	152,520,830	1,620,943	2,023,780
Pennsylvania.....	53	10,621	34	423	1,249	680	8,235	Jy	8,512	Mh	8,017	8,023	7,860	161	2	140,154,231	1,763,412	2,331,111
Texas.....	39	9,767	10	252	1,017	264	8,224	De	9,280	Ja	6,724	9,204	8,963	241	.....	153,227,300	809,679	1,295,996
All other states ¹	41	13,672	19	513	1,097	406	11,637	.....	.....	.....	.....	12,538	12,175	361	2	239,290,631	2,085,479	2,116,645

STATE.	EXPENSES—continued.						Value of products.	Value added by manufacture.	POWER.						Electric horsepower generated in establishments reporting.					
	Salaries and wages—Con.	For contract work.	Rent and taxes.		For materials.				Primary horsepower.					Rented (electric).						
			Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Owned.										
										Steam engines (not turbines).	Steam turbines.	Internal combustion engines.	Water power. ²							
United States...	\$89,749,637	\$2,352,306	\$125,909	\$78,282,638	\$1,194,403,246	\$53,505,109	\$1,632,532,706	\$384,624,411	238,906	95,020	49,723	42,647	131	51,385	57,240					
California.....	8,179,397	644,530	17,667	9,338,806	136,823,709	5,052,876	213,292,194	71,415,549	60,307	26,221	381	12,939	130	20,636	1,973					
Illinois.....	3,483,872	5,583	5,260	2,786,198	50,550,881	3,502,477	64,548,042	10,495,284	5,106	3,457	228	75	.....	1,346	5,167				
Kansas.....	3,065,412	.....	23,200	1,553,082	48,113,618	3,217,151	63,785,520	12,449,751	10,950	4,515	1,863	2,225	1	2,346	1,901				
Louisiana.....	4,388,047	122,020	3,996	6,108,906	48,638,652	964,731	75,023,726	25,420,343	7,138	1,051	1,600	3,820	.....	67	5,702				
Missouri.....	1,388,603	.....	2,898	123,978	10,620,118	1,494,934	24,610,532	3,495,480	2,545	1,140	1,390	15	.....	.....	1,273		
New Jersey.....	18,023,734	500	700	17,898,614	214,618,316	8,208,059	280,994,553	68,108,178	36,040	12,843	14,391	8,806	.....	.....	3,868			
Ohio.....	3,245,959	.....	330	3,819,640	29,997,014	1,961,063	43,282,801	11,324,724	7,383	4,175	1,170	155	.....	1,883	192			
Oklahoma.....	5,909,664	27,784	22,960	1,188,857	122,435,363	4,714,359	150,073,458	23,523,736	24,477	9,328	5,524	3,523	.....	6,102	1,718				
Pennsylvania.....	11,960,122	619,612	16,099	15,390,629	130,071,762	4,909,443	178,825,632	43,844,427	22,606	9,962	5,495	4,540	.....	2,609	8,986				
Texas.....	11,757,668	251,928	2,045	1,711,403	184,617,478	8,260,485	241,757,313	48,879,350	27,543	2,767	10,375	2,700	.....	11,701	15,400				
All other states ¹	18,347,099	680,349	30,754	18,392,525	208,911,275	11,159,531	295,738,395	75,667,589	34,811	18,961	7,306	3,849	.....	4,695	11,060				

¹ All other states embrace: Arkansas, 1 establishment; Colorado, 5; Delaware, 1; Idaho, 1; Indiana, 3; Kentucky, 3; Maryland, 4; Minnesota, 1; Missouri, 4; New York, 6; Rhode Island, 1; Tennessee, 1; Utah, 1; Virginia, 1; West Virginia, 5; and Wyoming, 7.

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

SOAP.

GENERAL STATISTICS.

General character of the industry.—The establishments under this classification, including the soap departments of slaughtering and meat-packing plants, manufacture hard and soft soaps, liquid soaps, etc. In addition, there is a considerable production of soap by establishments in other lines of manufacture, and the soap products of such establishments are included in the detailed statistics of products.

Comparative summary.—Table 1 presents the statistics for the census years 1904 to 1919, inclusive, with percentages of increase. Prior to 1904 soap and candles were combined, and as a combined industry it runs back to the census of 1859.

Principal states, ranked by value of products.—Table 2 summarizes the more important statistics for the industry, by states, ranked according to value of products. Some of the states which can not be shown separately ranked higher than some of those given in the table, notably Ohio, which was first in value of products; Kansas, fifth; Nebraska, thirteenth; and Texas, seventeenth. Though establishments were reported from 35 states, the industry is largely centralized, the leading states being Ohio, New York, New Jersey, Illinois, Kansas, and Massachusetts—three states of the Middle West and three of the North Atlantic.

Persons engaged in the industry.—The age classification of the average number of wage earners in this table is an estimate obtained by the method described in the "Explanation of terms." Figures for the states will be found in Table 15.

Table 3 shows the proportion of female wage earners increased from 25 per cent of all wage earners in 1914 to 29.1 per cent in 1919, and similar gains are shown for the female employees in the salaried groups.

Wage earners, by months.—The statistics presented in Table 4 are designed to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Females constituted 29.1 per cent of the average number of wage earners in 1919, with a maximum of 45.8 per cent of the total in Wisconsin. The percentage was also high in Missouri, 40 per cent, and in Illinois 37.4 per cent. The statistics show a greater range between minimum and maximum employment for 1919 than for prior censuses. In Missouri the minimum was but 55.7 per cent of the maximum, while in Indiana employment was fairly steady and the minimum was 85.5 per cent of the maximum.

Prevailing hours of labor.—The figures shown in Table 5 emphasize the tendency toward the shortening of the working day. In 1909, 66 per cent, and in

1914, 57.7 per cent of the total average number of wage earners were in establishments where the prevailing hours of labor per week were in excess of 54; whereas in 1919 but 10.3 per cent were in this class. On the other hand, in 1909 only 4.9 per cent were in establishments where the prevailing hours per week were 48 or less; whereas in 1914 this percentage had increased to 7.2 and in 1919 to 63.4 per cent.

Size of establishments, by average number of wage earners.—The figures in Table 6 show the growth in the size of establishments during the period 1914–1919, the average number of wage earners for all plants in 1919 being 59 as compared with 38 in 1914. In 1914 there were 7 establishments each of which employed over 500 wage earners, aggregating 6,159. In 1919 there were 11 establishments of this character, with 12,484 wage earners.

Size of establishments, by value of products.—Measured by value of products, it is apparent that the increase in number of establishments is in the higher groups, though this grouping is materially affected by the high level of values in 1919 as compared with 1914. Table 7 shows the degree of concentration of production in large establishments. The average value of products per establishment increased from \$265,000 in 1909 to \$345,000 in 1914 and to \$910,000 in 1919.

Character of ownership.—Table 8 presents the statistics concerning the character of ownership, or legal organization, of the establishments, for the United States and the principal states. The figures show growth for the "Corporations" group, which in 1919 averaged approximately \$1,390,000 in value of products per establishment as compared with \$467,000 in 1909; whereas the other two groups combined, "Individuals" and "All others," averaged \$64,000 per establishment in 1919 as compared with \$80,000 in 1909.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power. The rated horsepower in 1919 was slightly less than that reported in 1914, the decrease being in steam power. There is shown a material increase in rented electric power and also in electric power generated by the establishments reporting. In 1919 the rated capacity of all electric motors was nearly double the capacity reported for 1914. In 1919, 90.9 per cent of the total primary power, whether owned or rented, was utilized in the form of electric power, as compared with 47.5 per cent in 1914 and 45.3 per cent in 1909.

Fuel consumed.—Table 10 presents the statistics for fuel consumed, by kinds and by states.

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

	1919	1914	1909	1904	PER CENT OF INCREASE. ¹		
					1914-1919	1909-1914	1904-1909
Number of establishments.....	348	371	420	436	-6.2	11.7	-3.7
Persons engaged.....	28,919	19,839	18,393	14,501	45.8	7.9	26.8
Proprietors and firm members.....	183	252	329	399	-27.4	23.4	-17.6
Salaried employees.....	8,300	5,415	5,065	3,058	53.3	6.9	65.6
Wage earners (average number).....	20,436	14,172	12,999	11,044	44.2	9.0	17.7
Primary horsepower.....	33,710	35,737	28,860	20,228	-5.7	26.0	40.2
Capital.....	\$212,416,866	\$92,871,533	\$71,951,109	\$54,816,301	128.7	29.1	31.3
Salaries and wages.....	\$35,399,914	\$14,779,629	\$11,732,431	\$3,265,248	139.5	26.0	41.0
Salaries.....	\$14,171,851	\$6,091,692	\$5,505,549	\$3,502,572	111.8	21.5	57.2
Wages.....	\$21,228,063	\$8,687,937	\$6,226,882	\$4,762,676	162.5	29.9	30.7
Paid for contract work.....	\$639,688	\$48,916	\$119,009	\$28,504	1,207.7	59.1	319.6
Rent and taxes.....	\$6,068,675	\$1,021,534	\$541,003	\$413,430	494.1	88.8	30.9
Cost of materials.....	\$235,518,858	\$85,866,780	\$72,179,418	\$43,625,608	168.4	23.1	65.5
Value of products.....	\$316,740,115	\$127,942,441	\$111,357,777	\$68,274,700	147.6	14.9	63.1
Value added by manufacture ²	\$78,221,257	\$39,075,655	\$39,178,359	\$24,649,092	100.2	-0.3	58.9
Soap production.....pounds	2,419,410,000	2,121,230,000	1,854,286,000	1,430,509,000	14.7	14.4	29.6
Hard soap.....	2,308,612,000	2,064,228,000	1,794,249,000	1,380,610,000	12.5	15.0	26.4
Other soap (soft soap, liquid soap, and special soap articles).....	110,798,000	\$ 67,002,000	\$ 60,037,000	\$ 43,899,000	94.4	-5.1	36.8

¹ A minus sign (—) denotes decrease.² Exclusive of internal revenue.³ Value of products less cost of materials.⁴ Reported as soft soap.

TABLE 2.—PRINCIPAL 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.	348	20,436	100.0	....	\$316,740	100.0	....	\$78,221	100.0	....	Connecticut.....	6	445	2.2	12	\$5,145	1.6	12	\$2,967	3.8	10
New York.....	50	4,159	20.4	1	50,844	16.1	2	13,060	16.7	2	Rhode Island.....	8	117	0.6	14	1,944	0.6	14	688	0.9	14
New Jersey.....	16	2,889	14.1	3	37,382	11.8	3	10,035	12.8	3	Iowa.....	7	82	0.4	15	1,427	0.5	15	434	0.6	15
Illinois.....	29	2,270	11.1	4	25,734	8.1	4	6,250	8.0	5	Minnesota.....	7	46	0.2	17	822	0.3	16	200	0.3	16
Massachusetts....	27	1,008	4.9	7	18,730	5.9	6	7,556	9.7	4	Colorado.....	6	11	0.1	22	135	(1)	21	31	(1)	22
Pennsylvania.....	53	1,214	5.9	8	16,063	5.1	7	5,710	7.3	6	Washington.....	5	10	0.1	23	98	(1)	22	50	0.1	21
California.....	27	608	3.0	10	11,295	3.6	8	2,983	3.8	8	Louisiana.....	6	24	0.1	20	70	(1)	23	31	(1)	23
Wisconsin.....	11	691	3.4	8	8,909	2.8	9	3,189	4.1	9	Utah.....	4	4	(1)	30	14	(1)	30	8	(1)	29
Missouri.....	7	652	3.2	9	8,556	2.7	10	2,888	3.7	11	All other states ..	63	5,666	27.7	....	123,894	39.1	....	19,533	25.0	...
Indiana.....	10	540	2.6	11	5,678	1.8	11	2,608	3.3	12											

¹ Less than one-tenth of 1 per cent.

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.		CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.	
					Male.	Female.						Male.	Female.
All classes.....	1919	28,919	19,827	9,092	68.6	31.4	Clerks and other subordinate salaried employees.....	1919	6,957	3,911	3,046	56.2	43.8
	1914	19,839	14,671	5,168	74.0	26.0		1914	4,844	3,237	1,607	66.8	33.2
	1909	18,393	13,780	4,613	74.9	25.1		1909	4,431	3,269	1,162	73.8	26.2
Proprietors and officials.....	1919	1,526	1,426	100	93.4	6.6	Wage earners (average number).....	1919	20,436	14,490	5,946	70.9	29.1
	1914	823	799	24	97.1	2.9		1914	14,172	10,635	3,537	75.0	25.0
	1909	963	925	38	96.1	3.9		1909	12,999	9,586	3,413	73.7	26.3
Proprietors and firm members...	1919	183	171	12	93.4	6.6	16 years of age and over.....	1919	20,197	14,368	5,829	71.1	28.9
	1914	252	236	16	93.7	6.3		1914	13,964	10,532	3,432	75.4	24.6
	1909	329	306	23	93.0	7.0		1909	12,664	9,420	3,245	74.5	25.5
Salaried officers of corporations...	1919	365	343	22	94.0	6.0	Under 16 years of age.....	1919	230	122	117	51.0	49.0
	1914	286	280	6	97.9	2.1		1914	208	103	105	49.5	50.5
	1909	274	265	9	96.7	3.3		1909	335	157	178	46.9	53.1
Superintendents and managers...	1919	978	912	66	93.3	6.7							
	1914	285	263	2	99.3	0.7							
	1909	360	354	6	98.3	1.7							

MANUFACTURES.

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

[The month of maximum employment 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:														
1919.....	20,436	20,590	18,789	18,055	<i>17,063</i>	19,223	20,932	21,759	22,567	22,653	22,080	21,229	19,392	79.3
Males.....	14,490	14,578	13,266	12,880	<i>12,774</i>	13,753	14,856	15,434	16,091	16,169	15,541	14,946	13,592	79.0
Females.....	5,946	6,012	5,523	5,175	<i>5,189</i>	5,470	6,076	6,325	6,476	6,484	6,539	6,283	5,800	79.1
1914.....	14,172	14,212	14,325	14,427	<i>14,461</i>	14,418	14,138	13,893	13,927	14,160	14,286	14,106	<i>13,711</i>	94.8
1909.....	12,999	<i>12,387</i>	12,671	12,885	12,843	12,476	12,653	13,001	13,105	13,250	13,475	13,649	13,650	90.4
California.....	608	633	632	593	545	<i>584</i>	622	634	603	608	625	645	632	81.2
Illinois.....	2,270	2,383	2,222	1,959	1,970	2,144	2,236	2,374	2,451	2,507	2,474	2,341	2,179	78.1
Indiana.....	540	531	517	542	525	543	550	553	567	585	555	512	<i>500</i>	85.5
Massachusetts.....	1,008	915	858	855	<i>788</i>	882	896	979	1,052	1,121	1,257	1,274	1,221	61.7
Missouri.....	652	710	513	448	527	637	681	804	785	680	667	681	685	55.7
New Jersey.....	2,889	2,863	2,702	<i>2,068</i>	2,096	2,773	2,909	3,024	3,150	3,111	2,991	2,894	2,893	84.5
New York.....	4,159	4,293	3,847	<i>3,848</i>	3,869	4,052	4,237	4,329	4,497	4,512	4,372	4,203	3,855	85.2
Pennsylvania.....	1,214	1,128	1,072	<i>1,051</i>	1,105	1,137	1,256	1,255	1,331	1,363	1,342	1,284	1,249	77.1
Wisconsin.....	691	672	744	606	584	<i>529</i>	660	676	717	772	767	743	762	68.5
States employing a large proportion of females.														For cf. av. is of state.
Illinois.....	848	870	788	707	725	780	803	884	918	991	970	893	847	37.4
Massachusetts.....	317	244	241	240	<i>229</i>	277	279	310	339	342	481	411	411	31.4
Missouri.....	261	294	177	153	180	255	254	328	342	275	279	285	299	40.0
New Jersey.....	893	904	894	874	<i>832</i>	862	905	904	893	945	928	898	857	30.9
New York.....	1,181	1,235	1,181	1,159	1,186	1,199	1,228	1,234	1,210	1,161	1,128	1,162	<i>1,069</i>	28.4
Pennsylvania.....	279	235	<i>226</i>	233	252	266	291	283	304	298	315	326	310	23.0
Wisconsin.....	316	354	354	223	196	176	284	289	343	438	425	350	360	45.7

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

STATE.	Cen- sus year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—								STATE.	Cen- sus year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							
			44 and under.	Be- tween 44 and 48.	48. ¹	Be- tween 48 and 54.	54.	Be- tween 54 and 60.	60.	Over 60.				44 and under.	Be- tween 44 and 48.	48. ¹	Be- tween 48 and 54.	54.	Be- tween 54 and 60.	60.	Over 60.
United States.	1919	20,436	2,456	832	9,667	4,474	905	1,802	293	7	Missouri.....	1919	652	1	1	.....	378	254	18	.....
	1914	14,172	(²)	(²)	1,027	3,446	1,514	6,371	1,814	.....		1914	521	(²)	(²)	101	.....	389	29	2	.....
	1909	12,999	(²)	(²)	835	1,780	1,908	3,840	.....	4,731		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California.....	1919	608	318	5	91	58	136	.....	.....	.....	New Jersey.....	1919	2,889	2	.....	2,206	543	20	118	.....
	1914	244	(²)	(²)	9	24	137	.....	74	.....		1914	2,057	(²)	(²)	17	1,609	56	355	20	.....
Illinois.....	1919	2,270	134	31	877	231	161	757	79	.....	New York.....	1919	4,159	25	2	3,090	508	138	246	150	.....
	1914	2,144	(²)	(²)	5	194	24	1,300	621	.....		1914	3,168	(²)	(²)	100	1,265	131	1,389	283	.....
Indiana.....	1919	540	7	3	4	487	.....	29	10	.....	Pennsylvania.....	1919	1,214	539	8	319	121	31	142	4	.....
	1914	315	(²)	(²)	3	1	.....	127	184	.....		1914	1,150	(²)	(²)	637	74	204	137	107	.....
Massachusetts.....	1919	1,008	714	.....	156	70	42	20	.....	.....	Wisconsin.....	1919	691	.....	.....	17	660	1	12	1	.....
	1914	460	(²)	(²)	23	199	110	128	.....	.....		1914	272	(²)	(²)	11	21	.....	234	6	.....

¹ Includes 48 and under for 1914 and 1909.² Corresponding figures not available.

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

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—																
	Establishments.	Wage earners (average number).	No wage earn- ers.	1 to 5 wage earn- ers, inclusive.		6 to 20 wage earn- ers, inclusive.		21 to 50 wage earn- ers, inclusive.		51 to 100 wage earn- ers, inclusive.		101 to 250 wage earn- ers, inclusive.		251 to 500 wage earn- ers, inclusive.		501 to 1,000 wage earn- ers, inclusive.		Over 1,000 wage earn- ers.	
			Estab- lish- ments.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.	Estab- lish- ments.	Wage earn- ers.
United States...1919..	348	20,436	49	153	390	70	853	31	981	12	957	14	2,187	8	2,584	7	4,756	4	7,728
1914..	371	14,172	43	166	396	90	1,033	29	1,017	14	1,125	17	2,763	5	1,679	4	2,886	3	8,773
California.....	27	608	9	6	26	8	94	2	66	.....	.....	1	109	1	313	.....	.....	.....	.....
Illinois.....	29	2,270	.....	12	23	7	71	4	111	2	162	2	300	.....	.....	2	1,598	.....	.....
Indiana.....	10	540	.....	6	18	1	11	1	24	.....	.....	1	181	1	306	.....	.....	.....	.....
Massachusetts.....	27	1,008	3	11	19	8	104	2	77	1	96	1	141	1	571	1	.....	.....	.....
Missouri.....	7	652	.....	3	7	1	13	.....	.....	.....	.....	2	378	1	254	.....	.....	.....	.....
New Jersey.....	16	2,889	.....	6	22	2	24	2	77	3	202	1	118	1	306	.....	.....	1	2,140
New York.....	56	4,159	7	27	70	10	142	5	139	2	153	2	305	1	376	.....	.....	2	2,973
Pennsylvania.....	53	1,214	8	30	84	10	123	2	76	.....	.....	1	119	1	256	.....	556	.....	.....
Wisconsin.....	11	691	3	3	3	4	57	.....	.....	.....	.....	.....	.....	.....	631	.....	.....	.....	.....

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.....	348	371	420	20,436	14,172	12,999	\$316,740,115	\$127,942,441	\$111,357,777	\$78,221,257	\$39,075,655	\$39,178,359
Less than \$5,000.....	69	82	104	32	60	83	130,132	185,506	253,674	62,374	98,548	130,996
\$5,000 to \$20,000.....	64	82	102	141	200	264	756,872	879,269	1,089,754	334,509	389,719	468,411
\$20,000 to \$100,000.....	78	102	110	432	768	834	3,066,415	4,916,766	5,362,689	1,342,732	1,637,374	1,808,374
\$100,000 to \$500,000.....	80	65	82	1,272	2,711	3,980	17,917,731	14,351,125	27,740,013	6,393,243	8,311,788	10,460,303
\$500,000 to \$1,000,000.....	21	11	22	1,188	10,433	7,838	13,571,081	7,316,314	70,911,647	5,294,596	28,538,226	26,310,275
\$1,000,000 and over.....	36	29		17,371			280,397,884	100,233,471		64,793,803		
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.....	19.8	22.1	24.8	0.2	0.4	0.6	(1)	0.1	0.2	0.1	0.3	0.3
\$5,000 to \$20,000.....	18.4	22.1	24.3	0.7	1.4	2.0	0.2	0.7	1.0	0.4	1.0	1.2
\$20,000 to \$100,000.....	22.4	27.5	26.2	2.1	5.4	6.4	1.3	3.8	4.8	1.7	4.3	4.6
\$100,000 to \$500,000.....	23.0	17.5	19.5	6.2	19.1	30.6	5.7	11.2	24.9	8.2	21.3	26.7
\$500,000 to \$1,000,000.....	6.0	3.0		5.8			4.3	5.7		6.8		
\$1,000,000 and over.....	10.3	7.8	5.2	85.0	73.6	60.3	88.5	78.4	69.1	82.8	73.2	67.2

¹ Less than one-tenth of 1 per cent.

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

STATE.	Cen- sus year.	NUMBER OF ESTABLISH- MENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.									VALUE OF PRODUCTS.								
		Indi- vid- uals.	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- uals.	Cor- pora- tions.	All oth- ers.	Indi- vid- uals.	Cor- pora- tions.	All oth- ers.		Indi- vid- uals.	Corpora- tions.	All others.	Indi- vid- uals.	Corpora- tions.	All oth- ers.				
United States.....	1919	87	222	39	20,436	299	19,780	357	1.5	96.8	1.7	\$316,740,115	\$4,517,647	\$308,620,995	\$3,601,473	1.4	97.4	1.1				
	1914	106	200	65	14,172	484	13,039	649	3.4	92.0	4.6	127,942,441	3,829,844	120,009,032	4,103,565	3.0	93.8	3.2				
	1909	142	201	77	12,999	801	10,607	1,591	6.2	81.6	12.2	111,357,777	5,302,283	93,937,697	12,117,797	4.8	84.4	10.9				
California.....	1919	7	15	5	608	.....	591	¹ 17	.....	97.2	2.8	11,295,294	.....	11,048,199	¹ 247,065	.....	97.8	2.2
Illinois.....	1919	1	24	44	2,270	.....	2,220	¹ 50	.....	97.8	2.2	25,733,832	.....	25,337,590	¹ 396,242	.....	98.5	1.5
	1914	7	18	2	2,144	² 39	2,105	.....	1.8	98.2	.....	21,420,035	² 247,769	21,172,266	.....	1.2	98.8	.....			
Indiana.....	1919	1	9	.....	540	.....	¹ 540	.....	.....	100.0	.....	5,678,183	.....	¹ 5,678,183	.....	.....	100.0	.....			
Massachusetts.....	1919	7	15	5	1,008	9	989	10	0.9	98.1	1.0	18,729,572	126,236	18,520,896	82,440	0.7	98.9	0.4				
Missouri.....	1919	1	6	.....	652	.....	¹ 652	.....	.....	100.0	.....	8,555,927	.....	¹ 8,555,927	.....	.....	100.0	.....			
	1914	2	5	2	521	.....	² 521	.....	.....	100.0	.....	4,919,685	.....	² 4,919,685	.....	.....	100.0	.....			
New Jersey.....	1919	2	12	2	2,889	.....	² 2,889	.....	.....	100.0	.....	37,381,759	.....	² 37,381,759	.....	.....	100.0	.....			
	1914	2	12	2	2,057	.....	² 2,057	.....	.....	100.0	.....	16,692,406	.....	² 16,692,406	.....	.....	100.0	.....			
New York.....	1919	10	44	2	4,159	² 114	4,045	.....	2.7	97.3	.....	50,843,837	² 186,705	48,657,132	.....	4.3	93.7	.....			
	1914	20	36	9	3,168	140	3,024	4	4.4	95.5	0.1	27,520,199	1,695,793	25,793,857	36,549	6.2	93.7	0.1				
Pennsylvania.....	1919	20	15	9	1,214	86	949	179	7.1	78.2	14.7	16,063,276	969,691	13,276,366	1,817,219	6.0	82.7	11.8				
	1914	26	11	13	1,159	105	732	322	0.1	63.2	27.8	10,098,393	621,632	7,678,032	1,798,729	6.2	76.0	17.3				
Wisconsin.....	1919	4	7	.....	691	13	678	.....	1.9	98.1	.....	8,908,906	102,255	8,806,651	.....	1.1	98.9	.....			

¹ Includes the group "Individuals."² Includes the group "All others."³ Includes the groups "Individuals" and "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.....	1,350	846	696	33,710	35,737	23,360	100.0	100.0	100.0
Owned.....	253	414	465	25,028	30,091	25,038	74.2	84.2	88.3
Steam.....	240	399	446	24,787	29,805	24,538	73.5	83.4	86.5
Engines.....	229	(1)	(1)	22,352	(1)	(1)	66.3		
Turbines.....	11	(1)	(1)	2,435	(1)	(1)	7.2		
Internal-combustion engines.....	12	10	14	201	120	245	0.6	0.3	0.9
Water wheels and turbines.....	1	5	5	40	166	255	0.1	0.5	0.9
Rented.....	1,097	432	231	8,682	5,646	3,322	25.8	15.8	11.7
Electric.....	1,097	432	231	8,672	4,014	1,974	25.7	11.2	7.0
Other.....				10	1,632	1,348	(1)	4.6	4.8
Electric.....	4,177	1,902	1,196	30,649	16,960	12,839	100.0	100.0	100.0
Rented.....	1,097	432	231	8,672	4,014	1,974	28.3	23.7	15.4
Generated by establishments reporting.....	3,080	1,470	965	21,977	12,946	10,865	71.7	76.3	84.6

¹ Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.² Figures not available.³ Less than one-tenth of 1 per cent.

MANUFACTURES.

TABLE 10.—FUEL CONSUMED, BY STATES: 1919.

STATE.	Cen- sus year.	COAL.		Coke (tons, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
		Anthracite ¹ (tons, 2,240 pounds).	Bituminous (tons, 2,000 pounds).				
United States.....	1919	107,932	606,385	1,082	93,853	3,030	12,023
	1914	83,373	515,356	2,850	36,150	(²)	70,948
California.....	1919		16		79,560	122	188
	1914	11	1,297		34,851	(²)	169
Illinois.....	1919	78	99,051	18	4		224
	1914	11	112,409	23	621	(²)	3,343
Indiana.....	1919		12,254		4,000		104
	1914		10,091	33			
Massachusetts.....	1919	9,353	8,775	111	355		45
	1914	316	10,456	27			80
Missouri.....	1919		20,616	413			96
	1914		27,189				50
New Jersey.....	1919	77,733	6,651				72
	1914	52,564	9,804				6,100
New York.....	1919	16,343	94,278	497	1,263	2,701	2,229
	1914	27,874	107,922		510	(²)	4,009
Pennsylvania.....	1919	1,519	38,055		6,426	96	2,486
	1914	2,446	26,996	2,753			15,925
Wisconsin.....	1919	15	11,013	3			2,740
	1914	2	4,310	1			49
All other states.....	1919	2,891	315,675	40	2,245	111	3,779
	1914	154	204,882	13	168	(²)	41,133

¹ Includes some semianthracite.² Included in figures for fuel oils.

SPECIAL STATISTICS.

Materials and products.—Table 11 shows the statistics for the principal materials and the products for 1919, 1914, and 1909; also the number of establishments involved. The statistics for materials relate only to establishments manufacturing soap as the chief product, which constitute the classified industry. Establishments in other industries that manufactured soap as a subsidiary product did not report the materials used in soap manufacture. The table gives the statistics for certain intermediates made from purchased materials and consumed in soap manufacture in the same establishment. The statistics for products embrace all soap products, inclusive of those made by subsidiary soap establishments.

The expense for fats and oils, including fish oil and fatty acids, in 1919, constituted 49 per cent of the cost of all materials, as compared with 62 per cent in 1914 and 57.3 in 1909. The item "All other materials" includes materials consumed in the manufacture of products other than soaps, such as cottolene, lard substitutes, edible oils, etc., as well as boxes and containers.

The production of hard soaps as reported in 1919 is an increase of 11.6 per cent in quantity and 117.3 per cent in value over the corresponding figures for 1914, the increase for the period 1909-1914 being 15 per

cent in quantity and 14.7 in value. The soap establishments reported a total production of 49,498,627 pounds of refined glycerin, of which 2,121,476 pounds were consumed in the establishments producing. The total production of refined glycerin by all manufacturing establishments, including those in the chemical and other industries, was approximately 129,000,000 pounds, which, however, includes some refined glycerin from imported stock.

The schedule used called for the quantity and value of the different classes of hard soaps, but some manufacturers could not furnish separate values for the different classes, and there was some confusion due to the fact that the distinction between the different kinds is not clearly marked. The figures for powdered soap, sold as such, include 67,453,534 pounds of scouring soaps and cleaners, valued at \$4,355,345. The returns were tabulated as reported by the manufacturers. The bulk of the item "All other hard soaps"—95 per cent of same—was reported under this head without other indication as to kind or character.

Table 12 shows, by states, for 1919 the quantity and cost of the principal materials and Table 13 the quantity and value of the soap products by states.

TABLE 11.—MATERIALS AND PRODUCTS; DETAILED STATISTICS OF QUANTITY AND COST OR VALUE: 1919, 1914, AND 1909.

	1919	1914	1909		1919	1914	1909
Number of establishments.....	439	513	526	PRODUCTS.			
The soap industry.....	348	371	420	Total value.....	\$337, 879, 913	\$135, 304, 499	\$115, 455, 190
Establishments manufacturing subsidiary soap products.....	91	142	106	Soap industry (all products).....	\$316, 740, 115	\$127, 942, 441	\$111, 357, 777
MATERIALS. ¹				Subsidiary soap products from other industries.....	\$21, 139, 798	\$7, 362, 058	\$4, 097, 413
Total cost.....	\$238, 518, 858	\$88, 866, 786	\$72, 179, 418	Hard soaps:			
Animal fats, tallow, grease, etc.:				Quantity, pounds.....	2, 308, 612, 000	2, 064, 228, 000	1, 794, 249, 000
Pounds.....	406, 411, 643			Tallow, foots, and olein soap.....	1, 072, 390, 000	1, 092, 034, 000	1, 051, 549, 000
Cost.....	\$54, 985, 298			Toilet soap.....	179, 350, 000	169, 926, 000	111, 571, 000
Red oil (commercial oleic acid):				Dye soap.....	2, 455, 000	(⁶)	(⁶)
Gallons.....	3, 227, 886	^a 546, 289, 571	^a 413, 969, 787	Powdered soap, sold as such.....	472, 610, 000	367, 744, 000	301, 176, 000
Cost.....	\$2, 598, 366	\$32, 565, 899	\$23, 341, 905	Soap chips.....	181, 837, 000	97, 746, 000	329, 953, 000
Other, including fish oil, fatty acids, etc.:				All other hard soaps.....	399, 970, 000	336, 778, 000	
Gallons.....	4, 087, 087			Value.....	\$227, 415, 154	\$104, 464, 542	\$91, 064, 466
Cost.....	\$3, 059, 407			Soft soap:			
Vegetable oils:				Pounds.....	64, 463, 000	57, 002, 000	60, 037, 000
Coconut oil—				Value.....	\$3, 925, 060	\$1, 697, 424	\$1, 269, 187
Gallons.....	24, 349, 831			Liquid soap:			
Cost.....	\$28, 217, 738	13, 225, 330	11, 856, 337	Pounds.....	10, 033, 000	(⁶)	(⁶)
Palm-kernel oil—				Value.....	\$1, 255, 213	(⁶)	(⁶)
Gallons.....	606, 807	\$9, 406, 583	\$5, 875, 294	Special soap articles:			
Cost.....	\$691, 962			Pounds.....	30, 228, 000		
Cottonseed oil—				Value.....	\$3, 204, 249	\$832, 654	\$706, 177
Gallons.....	7, 483, 977	15, 903, 691	24, 221, 712	Lye:			
Cost.....	\$5, 274, 155	\$9, 700, 088	\$9, 718, 988	Pounds.....	16, 301, 000	23, 340, 000	
Other vegetable oils:				Value.....	\$1, 789, 291	\$891, 265	
Gallons.....	^a 11, 320, 861			Glycerin: ⁷			
Cost.....	\$13, 293, 975	^a 123, 032, 886	^a 94, 050, 892	Crude, for sale—			
Soap stock:				Pounds.....	18, 228, 447	12, 745, 336	
Pounds.....	112, 353, 679	\$6, 456, 784	\$2, 453, 609	Value.....	\$2, 482, 779	\$1, 817, 536	
Cost.....	\$5, 773, 182			Refined, pounds.....	49, 498, 627	34, 831, 082	
Rosin:				For sale—			
Pounds.....	119, 520, 661	185, 310, 786	207, 296, 447	Pounds.....	47, 377, 151	32, 674, 491	\$6, 790, 282
Cost.....	\$7, 836, 738	\$4, 067, 992	\$4, 362, 412	Value.....	\$11, 461, 213	\$5, 775, 887	
Caustic soda:				Produced and consumed, pounds.....	2, 121, 476	2, 156, 591	5, 879, 279
Tons (2,000 pounds).....	80, 270	55, 320	52, 172	Stearin:			
Cost.....	\$5, 700, 421	\$1, 936, 575	\$2, 212, 232	Pounds.....	3, 139, 683		
Soda ash:				Value.....	\$825, 402		
Tons.....	92, 219	140, 983	121, 016	Candle pitch, tar or stearin pitch:			
Cost.....	\$3, 300, 866	\$1, 997, 575	\$2, 281, 787	Pounds.....	5, 211, 377		
All other materials.....	^a \$104, 696, 750	\$26, 784, 690	\$21, 953, 191	Value.....	\$91, 336	(⁶)	
Produced in works where consumed. ¹				Red oil (commercial oleic acid):			
Red oil, gallons.....	1, 552, 179	3, 653, 557	3, 128, 736	Produced.....	1, 985, 388		
Tallow, pounds.....	67, 113, 763	5, 331, 000	16, 664, 000	For sale—			
Cottonseed oil, gallons.....	23, 800	241, 005	2, 390, 098	Gallons.....	433, 207		
Caustic lye, gallons.....	28, 552, 086	22, 777, 000	15, 864, 000	Value.....	\$476, 140		
Sodium silicate, pounds.....	98, 603, 158	43, 197, 255	37, 466, 216	Made and consumed, gallons.....	1, 552, 179		\$15, 625, 078
Glycerin, pounds.....	40, 472, 470	2, 156, 591	5, 879, 279	Candles:			
Framed soap, pounds.....	834, 108, 448	618, 096, 000	524, 776, 000	Pounds.....	5, 483, 172	(⁶)	
				Value.....	\$818, 076	\$150, 402	
				Glue:			
				Pounds.....	35, 448		
				Value.....	\$2, 929	(⁶)	
				Tankage:			
				Tons.....	14, 356		
				Value.....	\$492, 082		
				Perfumes and toilet preparations.....	\$12, 635, 206	\$6, 804, 508	
				All other products.....	^a \$71, 005, 176	\$12, 870, 191	

¹ Not including those consumed in soap manufacture by establishments making subsidiary soap products.

² Reported in pounds as "tallow, grease, and other fats."

³ Comprises the following oils:

	Gallons.	Cost.
Castor.....	362, 746	\$463, 745
Corn.....	298, 118	341, 087
Linseed.....	38, 785	55, 962
Olive.....	124, 644	264, 896
Palm.....	2, 302, 463	2, 415, 798
Peanut.....	407, 359	506, 490
Soya-bean.....	7, 786, 746	8, 082, 380
Other vegetable oils.....	1, 163, 617	

⁴ Includes food products—lard substitutes, edible oils, etc., cottonseed products, and hardened oil—to the value of \$55,705,711; patent medicines and compounds, \$2,014,378; cleansing and polishing preparations, \$354,521; and other miscellaneous products, \$12,930,566.

⁴ Reported in pounds as "foots."

⁵ Includes other materials as follows:

	Quantity.	Cost.
Hydrogenated oils, pounds.....	17, 316, 625	\$1, 765, 895
Sodium silicate, tons (2,000 pounds).....	106, 087	2, 041, 784
Caustic potash, tons.....	1, 543	605, 505
Borax, tons.....	930	129, 470
Talc, etc., tons.....	42, 708	677, 215
Other constituent materials.....		564, 993

⁶ Figures not available.

⁷ Total production of refined glycerin, all industries, in 1919—69,464,298 pounds (includes 2,121,467 pounds made and consumed): Crude glycerin made for sale 21,462,735 pounds. See report on Chemicals.

MANUFACTURES.

TABLE 12.—PRINCIPAL MATERIALS, BY STATES: 1919.

MATERIAL AND STATE.	Quantity.	Cost.	MATERIAL AND STATE.	Quantity.	Cost.
Animal fats, tallow, grease, etc.	Pounds. 408,411,643	\$54,985,298	Vegetable oils—Continued.		
California.....	17,960,251	2,098,888	Olive-oil foots—Continued.	Pounds.	
Illinois.....	63,456,414	7,578,897	Pennsylvania.....	711,572	\$136,199
Indiana.....	8,458,414	995,197	Wisconsin.....	1,051,547	244,582
Massachusetts.....	39,413,627	5,677,720	All other states.....	309,086	67,848
Missouri.....	3,397,135	513,138	Gallons.	2,302,463	2,415,798
New Jersey.....	39,361,781	5,947,183	Palm oil.....		
New York.....	75,761,378	10,424,887	Illinois.....	41,829	54,099
Pennsylvania.....	27,838,675	3,938,869	Massachusetts.....	255,001	251,759
Rhode Island.....	4,067,950	535,002	New Jersey.....	1,726,532	1,785,712
All other states.....	126,696,018	17,275,517	New York.....	129,058	140,983
Gallons.	3,227,386	2,598,366	Rhode Island.....	49,021	59,885
Red oil (commercial oleic acid).....			All other states.....	101,022	123,360
Massachusetts.....	142,304	174,555	Palm-kernel oil.....	606,807	691,962
New Jersey.....	2,017,193	1,520,076	New Jersey.....	16,550	25,550
Pennsylvania.....	157,422	163,346	New York.....	9,838	13,269
All other states.....	910,467	740,389	Pennsylvania.....	283,400	322,624
Other, including fish oil, fatty acids, etc.	4,087,087	3,059,407	All other states.....	297,019	330,510
Illinois.....	64,143	93,563	Peanut oil.....	407,359	506,490
Massachusetts.....	38,217	41,785	California.....	135,156	177,879
New Jersey.....	155,893	188,198	Illinois.....	92,347	109,567
New York.....	1,363,946	903,102	New Jersey.....	18,668	25,029
Wisconsin.....	40,133	38,799	New York.....	10,484	17,092
All other states.....	2,424,755	1,793,900	All other states.....	160,704	176,323
Vegetable oils:			Soya-bean oil.....	7,788,746	8,082,380
Castor oil.....	362,746	463,745	California.....	300,203	337,047
Illinois.....	243,821	295,349	Illinois.....	109,809	110,081
New York.....	37,916	45,957	Indiana.....	110,806	122,939
Pennsylvania.....	20,034	38,817	Massachusetts.....	33,351	41,768
Wisconsin.....	26,430	33,827	New Jersey.....	283,006	345,882
All other states.....	28,545	49,795	New York.....	2,401,314	2,357,782
Coconut oil.....	24,349,831	28,217,738	Pennsylvania.....	334,443	423,318
California.....	1,901,568	1,910,385	All other states.....	4,183,754	4,343,573
Illinois.....	2,977,200	3,503,773	Other vegetable oils.....		1,163,617
Massachusetts.....	951,066	1,220,348	California.....		149,803
Missouri.....	2,140,070	2,942,904	Illinois.....		146,744
New Jersey.....	1,329,081	1,636,622	Massachusetts.....		276,870
New York.....	3,915,038	4,650,939	New Jersey.....		190,655
Pennsylvania.....	424,258	519,532	New York.....		127,897
Wisconsin.....	1,966,845	1,531,160	All other states.....		301,648
All other states.....	8,744,707	10,302,066	Hydrogenated oils.....	Pounds. 17,316,625	1,765,895
Corn oil.....	298,118	341,087	Illinois.....	35,300	6,201
Illinois.....	49,880	57,778	New Jersey.....	6,117,523	1,035,576
Indiana.....	30,317	28,701	New York.....	10,265,093	562,773
New Jersey.....	32,348	36,598	Wisconsin.....	37,302	8,579
New York.....	93,664	103,423	All other states.....	861,407	152,766
Pennsylvania.....	42,354	50,924	Rosin.....	119,520,661	7,836,738
All other states.....	49,555	63,693	California.....	2,767,585	160,214
Cottonseed oil.....	7,483,977	8,274,155	Illinois.....	11,101,057	684,433
California.....	876,184	1,049,363	Indiana.....	2,492,849	138,516
Illinois.....	512,623	719,360	Massachusetts.....	4,888,831	294,343
Minnesota.....	72,652	71,358	Missouri.....	3,020,900	217,656
Pennsylvania.....	88,400	100,925	New Jersey.....	32,880,396	2,390,715
All other states.....	5,934,118	6,333,149	New York.....	19,251,815	1,161,973
Cottonseed soap stock.....	Pounds. 108,389,245	4,948,000	Pennsylvania.....	15,268,722	1,069,049
Illinois.....	12,450,160	517,552	All other states.....	27,857,476	1,693,839
Indiana.....	6,488,717	368,191	Caustic soda.....	Net tons 80,279	5,700,421
Massachusetts.....	2,616,243	185,433	California.....	7,059	347,271
Missouri.....	8,668,140	437,535	Illinois.....	9,082	457,439
New Jersey.....	14,366,112	642,801	Massachusetts.....	4,134	315,299
New York.....	10,882,730	862,284	New Jersey.....	8,899	399,298
All other states.....	52,917,143	1,934,204	New York.....	13,142	1,103,530
Linseed oil.....	Gallons. 38,785	55,902	Pennsylvania.....	5,835	399,994
Illinois.....	14,444	18,573	All other states.....	32,138	2,647,690
Minnesota.....	6,635	9,293	Soda ash.....	92,219	3,390,866
New Jersey.....	3,013	5,065	California.....	4,717	211,224
New York.....	7,732	11,832	Illinois.....	9,205	265,733
All other states.....	6,961	11,109	Indiana.....	8,607	317,795
Olive oil.....	124,644	264,896	Massachusetts.....	3,126	119,072
Illinois.....	27,281	72,997	New Jersey.....	22,764	743,571
Massachusetts.....	22,122	19,787	New York.....	14,907	647,546
Missouri.....	10,000	27,500	Pennsylvania.....	4,798	202,007
New Jersey.....	35,884	95,244	Rhode Island.....	2,901	109,482
New York.....	11,533	18,442	All other states.....	21,194	774,436
Pennsylvania.....	15,165	26,146	Sodium silicate.....	106,087	2,041,784
All other states.....	2,659	4,780	California.....	6,155	186,857
Olive-oil foots.....	Pounds. 3,904,434	825,182	Illinois.....	8,889	132,575
Massachusetts.....	368,997	87,403	Massachusetts.....	1,088	35,078
New Jersey.....	1,146,278	218,282	New Jersey.....	6,146	245,222
New York.....	876,954	70,868	New York.....	14,285	299,187
			Pennsylvania.....	7,516	175,008
			Wisconsin.....	3,341	60,578
			All other states.....	58,667	907,299

TABLE 13.—SOAP PRODUCTS, BY STATES: 1919, 1914, AND 1909.

KIND AND STATE.	Value, 1919	QUANTITY (POUNDS).			KIND AND STATE.	Value, 1919	QUANTITY (POUNDS).		
		1919	1914	1909			1919	1914	1909
Hard soap.....	\$227,415,154	2,308,612,104	2,064,227,694	1,794,249,191	Liquid soap.....	\$1,255,213	10,032,928	(²)	(²)
California.....	9,450,110	95,908,950	(¹)	(¹)	Illinois.....	145,008	1,289,331		
Illinois.....	34,892,993	406,660,887	337,856,077	254,017,401	New Jersey.....	121,926	717,177		
Indiana.....	4,745,723	65,829,215	(¹)	(¹)	New York.....	325,317	2,470,092		
Massachusetts.....	16,156,135	89,206,812	69,924,649	67,179,247	Pennsylvania.....	121,554	1,454,183		
Missouri.....	7,834,832	75,340,094	76,714,777	93,639,378	Wisconsin.....	54,256	507,500		
New Jersey.....	30,319,371	307,034,378	234,543,027	199,501,374	All other states.....	487,152	3,594,645		
New York.....	34,531,105	394,770,526	419,323,945	374,590,818	Special soap articles.....	3,204,249	30,227,719	(²)	(²)
Pennsylvania.....	14,367,108	137,482,021	168,858,891	167,700,046	Connecticut.....	1,241,911	8,843,549		
Wisconsin.....	6,758,650	45,363,990	(¹)	(¹)	Illinois.....	229,931	1,611,726		
All other states.....	68,359,127	691,015,231	756,976,328	637,620,927	Massachusetts.....	251,638	1,871,659		
Soft soap.....	3,925,000	64,463,471	57,001,556	60,036,670	New Jersey.....	277,096	1,782,380		
Illinois.....	538,516	7,497,631	8,329,247	10,291,816	New York.....	535,792	4,967,751		
Massachusetts.....	213,088	2,036,131	5,456,908	6,812,254	Pennsylvania.....	296,112	3,632,528		
New Jersey.....	726,008	12,609,942	3,074,715	7,293,291	All other states.....	371,474	7,518,126		
New York.....	880,692	21,672,160	19,012,010	14,788,812					
Pennsylvania.....	169,213	3,261,112	6,624,125	9,690,079					
Rhode Island.....	256,522	3,438,600	3,728,631	2,050,567					
All other states.....	1,160,721	13,887,895	10,775,914	9,109,861					

¹ Included with "All other states."² Figures not available.

GENERAL TABLES.

Table 14 gives for 1919, 1914, and 1909 a comparative summary, by states, for number of establishments, average number of wage earners, primary horse-

power, wages, cost of materials, and value of products; and Table 15 presents for 1919 the detailed statistics for the industry, by states.

TABLE 14.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horse-power.	Wages.	Cost of materials.	Value of products.	STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horse-power.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.								Expressed in thousands.		
United States.....	1919	348	20,436	33,710	\$21,228	\$238,519	\$316,740	Missouri.....	1919	7	652	1,617	\$564	\$5,668	\$8,556
	1914	371	14,172	35,737	8,088	88,807	127,942		1914	9	521	1,358	279	2,811	4,920
	1909	420	12,999	28,860	6,227	72,179	111,358		1909	10	554	954	272	3,055	4,710
California.....	1919	27	608	1,520	610	8,312	11,295	New Jersey.....	1919	16	2,889	3,942	3,082	27,347	37,382
	1914	25	244	724	191	2,018	2,968		1914	16	2,057	4,276	1,200	10,760	16,692
	1909	23	166	477	115	1,117	1,570		1909	21	1,599	2,761	796	7,084	13,674
Connecticut.....	1919	6	445	1,054	423	2,178	5,145	New York.....	1919	56	4,169	8,142	4,319	37,784	50,844
	1914	7	258	636	131	771	1,672		1914	65	3,168	8,744	1,785	19,869	27,526
	1909	9	260	540	131	732	1,528		1909	67	2,976	5,873	1,436	15,612	23,583
Illinois.....	1919	29	2,270	2,578	2,366	19,484	25,734	Pennsylvania.....	1919	53	1,214	2,647	1,634	10,353	16,063
	1914	27	2,144	6,108	1,255	15,253	21,420		1914	50	1,159	2,554	657	6,601	10,098
	1909	34	2,188	5,155	1,053	13,948	20,181		1909	59	1,197	2,598	556	5,947	9,124
Indiana.....	1919	10	540	1,247	532	3,071	5,678	Rhode Island.....	1919	8	117	235	99	1,256	1,944
	1914	12	315	668	181	1,587	2,980		1914	12	167	461	85	923	1,539
	1909	11	128	366	54	552	813		1909	9	168	402	70	939	1,243
Iowa.....	1919	7	82	140	68	993	1,427	Washington ¹	1919	5	10	125	12	48	98
	1914	8	115	230	71	976	1,418		1914	4	9	35	6	82	64
	1909	9	150	270	58	910	1,382	Wisconsin.....	1919	11	691	729	607	5,720	8,909
Louisiana.....	1919	6	24	100	10	40	70		1914	11	272	339	132	1,369	2,894
	1914	4	22	78	8	107	172		1909	16	213	487	89	910	1,611
	1909	5	26	16	10	89	132	All other states.....	1919	73	5,681	6,646	5,877	104,470	124,043
Massachusetts.....	1919	27	1,008	2,785	984	11,173	18,730		1914	83	3,215	7,881	1,823	22,845	28,294
	1914	32	460	1,400	260	2,476	4,671		1909	109	2,918	7,082	1,360	18,907	27,504
	1909	38	458	1,379	227	2,377	4,283								
Minnesota ¹	1919	7	46	203	41	622	822								
	1914	6	46	185	24	493	614								

¹ Included with "All other states," 1909.

MANUFACTURES.

TABLE 15.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.										WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.					EXPENSES.		
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.		Capital.	Salaries and wages.			
					Male.	Female.	Average number.	Number, 15th day of—			Male.	Female.	Male.	Female.		Officials.	Clerks, etc.		
								Maximum month.	Minimum month.										
United States.....	348	23,919	183	1,343	3,911	3,046	20,436	Se 22,653	Ap 17,963	20,290	14,125	5,926	120	119	\$212,416,866	\$5,785,159	\$8,386,692		
California.....	27	819	21	35	125	30	608	No 645	My 524	621	479	142	.....	.....	6,068,144	236,552	280,660
Colorado.....	6	19	5	1	1	1	11	Mh 12	Ja 9	10	9	1	.....	.....	18,876	.....	2,220
Connecticut.....	6	586	1	35	48	57	445	Oc 487	Jy 380	484	321	162	.....	.....	2,720,839	172,921	128,840
Illinois.....	29	3,039	10	123	462	174	2,270	Se 2,507	Mh 1,959	2,493	1,530	892	12	59	14,907,810	447,811	837,439		
Indiana.....	10	663	1	27	83	12	540	Se 585	De 500	501	325	169	1	6	3,762,673	79,939	160,954		
Iowa.....	7	135	7	14	26	6	82	Se 95	Ap 57	88	61	26	.....	.....	1,009,268	81,295	69,750
Louisiana.....	6	36	3	3	5	1	24	Se 33	My 14	29	19	10	.....	.....	111,268	8,157	5,348
Massachusetts.....	27	1,583	18	108	264	185	1,008	No 1,274	Ap 786	1,189	783	370	10	26	14,902,772	367,906	391,135		
Minnesota.....	7	84	3	6	22	7	46	Au 57	De 37	44	33	11	.....	.....	453,144	17,846	41,810
Missouri.....	7	943	1	29	139	122	652	Jy 804	Mh 448	687	379	201	8	9	3,952,212	123,725	246,651		
New Jersey.....	16	4,213	6	104	773	441	2,889	Au 3,150	Mh 2,662	2,896	1,979	853	61	3	24,971,427	878,987	1,568,260		
New York.....	56	6,565	17	436	620	1,333	4,159	Se 4,512	Mh 3,842	4,195	3,021	1,172	1	1	48,552,626	1,448,120	1,828,558		
Pennsylvania.....	53	1,530	50	76	98	92	1,214	Se 1,863	Mh 1,051	1,192	906	261	13	12	11,654,472	299,673	261,294		
Rhode Island.....	8	167	5	17	25	3	117	Ja 132	De 108	108	79	28	1	.....	932,497	101,655	59,676	
Utah.....	4	7	2	.....	.....	1	4	Ja 1	Jy 3	5	5	.....	.....	.....	135,203	.....	750
Washington.....	5	19	3	2	3	1	10	De 18	Mh 6	19	15	4	.....	.....	99,590	3,680	4,132
Wisconsin.....	11	1,390	4	33	490	172	691	Se 772	My 529	764	401	361	2	.....	7,704,943	168,062	948,569	
All other states ¹	63	7,121	26	294	727	408	5,666	.....	.....	4,965	3,780	1,173	11	1	69,559,102	1,398,780	1,558,346

STATE.	EXPENSES—continued.							Value of products.	Value added by manufacture.	POWER.					
	Salaries and wages—Con.		Rent and taxes.		For materials.					Primary horsepower.					Electric horsepower generated in establishments reporting.
	Wage earners.	For contract work.	Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.	Total.			Owned.					
										Steam engines (not turbines).	Steam turbines.	Internal combustion engines.	Water power. ³	Rent. ⁴	
United States.....	\$21,228,063	\$630,688	\$268,543	\$5,800,132	\$234,698,114	\$3,820,744	\$316,740,115	\$78,221,257	33,710	22,352	2,435	201	40	8,682	21,977
California.....	610,405	489	8,693	147,819	8,150,285	161,812	11,295,294	2,983,197	1,520	598	.....	.....	.....	922	78
Colorado.....	13,010	.....	3,310	122	102,136	2,034	135,454	31,284	36	30	.....	.....	.....	6	.....
Connecticut.....	422,558	.....	1,400	285,317	2,101,519	76,616	5,144,996	2,966,861	1,054	835	.....	.....	40	179	850
Illinois.....	2,366,407	10,654	51,278	156,780	19,083,904	400,004	25,733,832	6,249,924	2,578	1,050	.....	.....	25	1,503	1,095
Indiana.....	532,091	8,672	4,258	382,657	3,016,713	53,888	5,678,183	2,607,582	1,247	174	.....	.....	.....	1,073	.....
Iowa.....	67,769	.....	255	38,248	983,138	10,290	1,427,489	434,061	140	90	.....	.....	.....	50	.....
Louisiana.....	10,496	.....	1,586	634	39,211	442	70,322	30,069	100	100	.....	.....	.....	.....	.....
Massachusetts.....	934,138	.....	22,807	1,104,860	10,847,792	325,440	18,729,573	7,556,340	2,785	597	.....	.....	.....	2,188	70
Minnesota.....	40,615	.....	2,052	18,198	614,129	8,045	822,363	200,189	203	130	.....	.....	.....	73	5
Missouri.....	564,498	591,050	38,970	301,229	5,588,494	79,279	8,555,027	2,888,154	1,617	1,393	.....	.....	.....	224	883
New Jersey.....	3,082,266	.....	31,355	887,924	27,001,178	346,054	37,381,759	10,034,527	3,942	3,826	.....	.....	.....	116	3,237
New York.....	4,318,587	1,888	48,858	657,989	36,901,901	882,303	50,843,337	13,050,633	8,142	4,965	2,405	2	.....	770	7,485
Pennsylvania.....	1,634,122	6,770	20,924	130,220	10,167,846	185,101	16,063,276	5,710,329	2,647	1,691	30	76	.....	850	329
Rhode Island.....	99,395	.....	3,735	85,894	1,231,129	24,813	1,943,778	687,836	235	180	.....	.....	.....	55	1
Utah.....	4,383	.....	235	315	5,468	229	13,597	7,900	35	20	.....	.....	.....	15	.....
Washington.....	12,047	.....	360	818	46,215	1,894	98,247	50,138	125	100	.....	.....	.....	25	.....
Wisconsin.....	607,124	.....	2,896	160,199	5,063,795	56,493	8,908,906	3,188,618	729	690	.....	.....	.....	30	758
All other states ²	5,858,152	20,165	25,571	1,434,900	103,153,261	1,206,007	123,893,283	19,534,015	6,575	5,883	.....	98	.....	594	7,188

¹ Same number reported for one or more other months.² All other states embrace: Florida, 1 establishment; Georgia, 1; Idaho, 1; Kansas, 3; Kentucky, 2; Maryland, 1; Michigan, 4; Montana, 1; Nebraska, 4; Nevada, 1; New Hampshire, 2; North Carolina, 1; Ohio, 28; Oregon, 4; Tennessee, 3; Texas, 4; Virginia, 1; West Virginia, 1.³ Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).⁴ Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

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. ¹					
								1914-1919	1909-1914	1904-1909	1899-1904	1889-1899	1879-1889
Number of establishments.....	1,191	1,394	1,535	1,287	1,503	670	508	-14.6	-12.1	23.2	-14.4	124.3	31.9
Persons engaged.....	31,093	38,294	44,524	37,526	45,945	(2)	(2)	-18.8	-14.0	18.6	-18.3	.....	.....
Proprietors and firm members..	1,460	1,621	2,567	1,997	2,192	(2)	(2)	-9.9	-36.9	28.5	-8.9	.....	.....
Salaried employees.....	1,566	1,856	2,446	2,147	1,889	(2)	(2)	-15.6	-24.1	13.9	13.7	.....	.....
Wage earners (av. number)....	28,067	34,817	39,511	33,382	41,864	15,268	10,535	-19.4	-11.9	18.4	-20.3	174.2	44.9
Primary horsepower.....	2,303	2,478	4,129	1,175	866	(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	\$1,836,390	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	\$2,933,491	\$1,623,061	91.8	-9.1	15.6	4.0	212.7	80.7
Salaries.....	\$2,242,856	\$1,434,415	\$1,655,391	\$1,152,222	\$778,694	(2)	(2)	50.4	-13.3	43.7	48.0	.....	.....
Wages.....	\$16,972,881	\$8,582,970	\$9,363,359	\$8,382,700	\$8,393,483	(2)	(2)	97.8	-8.3	11.7	-0.1	188.8	.....
Paid for contract work.....	\$425,407	\$532,143	\$658,006	\$51,843	\$160,309	.....	.....	-20.1	-19.1	1,160.2	-67.7	.....	.....
Rent and taxes.....	\$354,328	\$102,027	\$193,617	\$82,502	\$99,632	.....	.....	344.9	-0.8	209.8	-37.3	.....	.....
Cost of materials.....	\$13,929,888	\$5,535,561	\$4,910,838	\$3,774,637	\$6,186,492	\$2,874,693	\$2,324,637	151.6	12.7	30.1	-39.0	115.2	23.7
Value of products.....	\$53,051,294	\$20,990,191	\$25,295,017	\$23,937,024	\$20,344,888	\$8,077,379	\$5,876,983	152.7	-17.0	5.7	17.7	161.9	37.4
Value added by manufacture ²	\$39,121,406	\$15,454,630	\$20,384,179	\$20,162,387	\$14,158,396	\$5,202,686	\$3,552,346	153.1	-24.2	1.1	42.4	172.1	46.5
Quantity of principal products:													
Spirits of turpentine (gals.)....	17,693,841	26,980,981	28,988,954	30,687,051	37,733,500	(2)	(2)	-34.4	-6.9	-5.5	-18.7	.....	.....
Rosin (bbis. of 280 lbs. gross)...	2,033,322	2,885,077	3,263,857	3,508,347	4,348,094	(2)	(4)	-29.5	-11.6	-7.0	-19.3	.....	.....

¹ A minus sign (-) denotes decrease.

² Figures not available.

³ The capital reported for 1899 included timber land, valued at \$5,622,040.

⁴ Exclusive of internal revenue.

⁵ 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	28,067	100.0	.....	\$53,051	100.0	.....	\$39,121	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	2,495	8.9	5	5,548	10.5	5	4,257	10.9	3
Texas.....	10	1,018	3.6	6	3,801	6.2	6	2,783	7.1	6
South Carolina.....	22	84	0.3	7	168	0.3	7	105	0.3	7
North Carolina.....	14	26	0.1	8	167	0.3	8	77	0.2	8

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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	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	38,193	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	2,929	2,908	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	27,604	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	38,801	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	86	86	.....	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, FOR STATES: 1919.

[The month of maximum employment 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	28,918	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	28,806	26,609	27,391	28,406	28,652	28,729	28,569	28,602	28,227	28,515	28,184	27,842	89.8
Females.....	106	<i>112</i>	147	157	131	71	73	95	90	92	102	112	90	45.2
1914.....	34,817	33,717	33,984	35,769	37,408	37,767	37,647	37,579	35,747	34,031	32,608	31,150	<i>30,407</i>	80.5
1909.....	39,511	37,118	37,340	39,489	39,974	40,378	40,555	40,634	40,583	39,378	39,749	39,597	39,343	91.3
Alabama.....	3,014	2,784	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	10,588	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	6,763	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	2,234	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	2,201	2,248	2,488	2,646	2,623	2,572	2,682	2,685	2,662	2,495	2,451	<i>2,189</i>	81.5
North Carolina.....	26	<i>20</i>	27	21	22	27	28	28	28	29	29	30	30	66.7
South Carolina.....	84	<i>71</i>	76	82	82	81	84	91	89	88	87	87	92	77.2
Texas.....	1,018	1,263	1,232	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, FOR 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.....	1919	28,067	7,336	445	3,706	2,509	4,430	508	9,098	83
	1914	34,817	(²)	(²)	13,680	2,770	723	780	15,995	864
	1909	39,511	(²)	(²)	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	(²)	(²)	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	(²)	(²)	5,883	1,155	476	255	7,294	403
Georgia.....	1919	7,078	1,341	28	2,220	528	892	294	1,793	12
	1914	9,118	(²)	(²)	2,953	898	90	419	4,700	88
Louisiana.....	1919	2,604	1,306	.....	221	80	290	.....	757	.....
	1914	2,472	(²)	(²)	1,187	170	.....	.....	948	167
Mississippi.....	1919	2,495	49	14	4	19	259	.....	2,150	.....
	1914	3,275	(²)	(²)	1,494	405	9	50	1,240	77
North Carolina.....	1919	26	1	.....	.....	3	.....	18	4	.....
	1914	45	(²)	(²)	.....	9	1	.....	27	.....
South Carolina.....	1919	84	2	.....	2	14	.....	.....	61	5
	1914	221	(²)	(²)	127	20	.....	16	58	.....
Texas.....	1919	1,018	224	.....	16	.....	493	.....	285	.....
	1914	809	.....	.....	.....	.....	.....	.....	809	.....

¹ Includes 48 and under for 1914 and 1909.

² Corresponding figures not available.

MANUFACTURES.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR 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	1,298
1914	1,394	34,817	21	218	629	631	8,569	419	13,499	77	5,561	20	3,263	8	13,296
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	2	529
Georgia.....	441	7,078	18	72	225	250	3,220	90	2,808	9	575	2	250	.....	.....
Louisiana.....	33	2,604	.....	.....	.....	2	34	11	389	11	814	9	1,367	.....	.....
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	16	6	68	.....	.....	.....	.....	.....	.....	.....	.....
Texas.....	10	1,018	.....	.....	.....	2	34	5	177	1	70	1	244	1	493

¹ Includes 1 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
	1,191	1,394	1,585	28,067	34,817	39,511	\$53,051,294	\$20,090,191	\$25,295,017	\$39,121,406	\$15,454,630	\$20,384,179
All classes.....	1,191	1,394	1,585	28,067	34,817	39,511	\$53,051,294	\$20,090,191	\$25,295,017	\$39,121,406	\$15,454,630	\$20,384,179
Less than \$5,000.....	101	357	249	165	2,370	1,409	279,691	1,076,043	775,812	184,690	730,684	530,619
\$5,000 to \$20,000.....	395	800	971	3,684	15,987	19,261	5,050,453	8,494,419	11,216,577	3,594,627	6,152,268	8,933,708
\$20,000 to \$100,000.....	590	217	355	14,368	11,232	16,412	24,865,620	7,888,112	11,618,494	18,169,299	5,933,019	9,594,532
\$100,000 and over.....	105	20	10	9,850	5,228	2,429	22,855,630	3,531,617	1,684,144	17,172,790	2,037,759	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.....	8.5	25.0	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	37.6	45.9	46.4	38.4	47.1
\$100,000 and over.....	8.8	1.4	0.6	35.1	15.0	6.1	43.1	16.8	0.7	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.								
					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 oth- ers.		Indi- vid- uals.	Cor- pora- tions.	All oth- ers.	Indi- vid- uals.	Cor- pora- tions.	All oth- ers.		Indi- vid- uals.	Corpora- tions.	All others.	Indi- vid- uals.	Corpora- tions.	All oth- ers.				
United States...	1919	547	247	397	28,067	7,738	11,552	8,777	27.6	41.2	31.3	\$53,051,294	\$12,611,421	\$24,946,448	\$15,493,425	23.8	47.0	29.2				
	1914	552	221	621	34,817	8,571	12,812	13,434	24.6	36.8	38.6	20,990,191	4,731,586	8,402,035	7,856,769	22.5	40.0	37.4				
	1909	599	196	790	39,511	11,022	9,130	19,359	27.9	23.1	49.0	25,295,017	6,966,127	6,144,056	12,184,834	27.5	24.3	48.2				
Alabama.....	1919	89	29	56	3,014	957	1,151	906	31.8	38.2	30.1	5,892,492	1,795,939	2,353,317	1,743,230	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	642,881	546,710	857,541	31.4	26.7	41.9				
Florida.....	1919	175	107	170	11,748	3,502	4,257	3,989	29.8	36.2	34.0	21,508,553	5,692,083	8,428,667	7,387,803	26.5	39.2	34.3				
	1914	153	100	255	15,466	3,425	5,292	6,749	22.1	34.2	43.6	9,573,083	1,961,374	3,588,009	4,023,700	20.5	37.5	42.0				
Georgia.....	1919	244	46	151	7,078	3,064	774	3,240	43.3	10.9	45.8	10,874,714	4,609,655	1,320,380	4,044,679	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	1,694,126	447,636	2,465,828	36.8	9.7	53.5				
Louisiana.....	1919	2	30	1	2,604	64	2,319	221	2.5	89.1	8.5	5,591,289	67,719	5,040,448	483,122	1.2	90.1	8.6				
	1914	4	17	6	2,472	80	2,293	99	3.2	92.8	4.0	1,858,391	60,099	1,709,684	82,708	3.6	92.0	4.5				
Mississippi.....	1919	6	25	14	2,495	76	2,047	372	3.0	82.0	14.9	5,547,813	195,307	4,517,664	834,842	3.5	81.4	15.0				
	1914	16	30	15	3,275	233	2,770	272	7.1	84.6	8.3	1,997,139	155,842	1,552,057	289,240	7.8	77.7	14.5				
North Carolina.....	1919	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	.....	135.6	146,681	107,934	.....	138,747	73.6	.....	126.4
South Carolina.....	1919	19	.....	3	84	52	.....	32	61.9	.....	38.1	168,383	116,908	.....	51,475	60.4	.....	30.6
	1914	26	2	7	221	180	.....	141	81.4	.....	118.6	151,801	103,130	.....	148,671	87.9	.....	132.1
Texas.....	1919	.....	9	1	1,018	.....	1,002	16	.....	98.4	1.6	3,300,640	.....	3,269,772	30,868	.....	99.1	0.9
	1914	.....	4	2	809	.....	1,809	.....	.....	100.0	.....	608,374	.....	608,374	.....	.....	100.0	.....			

¹ Includes the group "Corporations."² 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	1,162	1,343	1,669	3,877	58.3	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	.....

¹ 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	1,053	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	2,663	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	461	105	392	27	447	105	373	20	1,581	427	1,340	123
Georgia.....	3,165	807	151	1,889	618	152	36	428	99	141	31	365	100	214	84	1,096	413
Louisiana.....	893	893	.....	.....	.....	569	.....	.....	.....	149	.....	.....	.....	175	.....	.....	.....
Mississippi.....	822	753	.....	69	.....	255	.....	20	.....	242	.....	15	.....	256	.....	34	.....
North Carolina.....	9	1	.....	8	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	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	.....	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.	Cen- sus year.	Number of estab- lish- ments.	MATERIALS USED (CRUDE GUM DISTILLED).						PRODUCTS. ¹						
			Dip (barrels 500 pounds).			Scrape (barrels 300 pounds).			Total value.	Spirits of turpentine.		Rosin.		Dross and other prod- ucts.	
			Total.	Gath- ered by estab- lish- ments re- porting. ²	Pur- chased. ²	Total.	Gath- ered by estab- lish- ments re- porting. ²	Pur- chased. ²		Gallons.	Value.	Barrels (280 pounds).	Value.		Value.
United States.....	1919	1,191	1,432,214	1,411,005	21,209	514,184	505,575	8,609	\$53,051,294	17,693,841	\$20,667,228	2,033,322	\$31,881,000	\$503,066.	
	1914	1,394	2,194,632	2,134,580	59,952	902,477	878,763	23,714	20,990,191	26,980,981	10,509,527	2,895,077	10,329,410	151,254	
	1909	1,585	2,376,903	2,248,724	128,179	1,099,789	1,047,849	51,940	25,285,017	28,988,954	12,654,228	3,263,857	12,576,721	64,068	
Alabama.....	1919	174	162,562	158,162	4,400	57,156	55,501	1,655	5,892,492	2,037,005	2,443,940	215,784	3,406,431	42,121	
	1914	160	227,695	221,106	6,589	110,629	107,427	3,202	2,047,132	2,721,777	1,053,133	294,820	985,968	8,033	
	1909	175	236,279	227,474	8,805	121,286	116,767	4,519	2,471,999	2,840,242	1,253,737	309,763	1,214,054	4,208	
Florida.....	1919	452	567,105	562,417	4,688	207,782	207,246	536	21,508,553	6,992,489	8,238,251	868,628	13,083,444	181,858	
	1914	508	975,535	970,712	4,823	427,484	425,370	2,114	9,573,083	12,363,232	4,820,679	1,310,307	4,695,561	56,843	
	1909	593	1,112,195	1,110,407	1,788	513,924	513,098	826	11,937,518	13,809,785	5,847,478	1,555,749	6,057,524	32,516	
Georgia.....	1919	441	345,280	345,312	2,968	95,197	94,636	561	10,374,714	3,997,310	4,544,679	419,090	6,228,507	101,528	
	1914	502	512,360	502,832	9,428	178,761	175,472	3,289	4,607,590	6,228,041	2,489,145	621,306	2,068,218	50,227	
	1909	592	656,736	647,348	9,388	295,225	291,005	4,220	6,938,957	8,056,752	3,556,965	904,103	3,371,676	10,316	
Louisiana.....	1919	33	143,668	143,668	.....	64,790	64,790	.....	5,591,289	1,885,231	2,070,871	201,608	3,404,585	115,833
	1914	27	175,908	175,172	736	74,181	73,871	310	1,858,391	2,252,118	835,509	269,274	1,006,279	18,003	
	1909	23	90,224	90,224	.....	43,164	43,164	.....	1,178,848	1,231,254	592,641	139,486	573,306	7,901
Mississippi.....	1919	45	138,495	134,123	4,372	54,384	51,890	2,494	5,547,813	1,749,812	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	275,205	1,081,040	10,352	
	1909	64	127,102	122,626	4,476	62,263	60,080	2,193	1,474,629	1,588,786	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	7,296	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	5,034	
	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	4,673	3,957	721	2,054	1,530	515	168,383	58,440	63,212	6,340	99,648	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	21,900	14,054	7,846	406,286	460,186	205,517	51,401	199,273	1,496	
Texas.....	1919	10	62,636	62,636	.....	29,606	29,606	.....	3,300,640	906,404	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	95,969	27,777	116,857	5,000

¹ 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 \$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 \$198,165, 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 706,868 gallons, valued at \$249,528, by wood-distillation establishments.

² 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.

The very large increase in the total value of products is therefore due entirely to the advance in the price of turpentine and rosin. The average value per gallon of spirits of turpentine distilled from gum was \$1.17 in 1919, \$0.39 in 1914, and \$0.44 in 1909. The turpentine produced by distillation of pine wood shows somewhat lower averages per gallon, namely, \$0.79 in 1919, \$0.34 in 1914, and \$0.35 in 1909. The average price per barrel of rosin produced from crude gum was \$15.68 in 1919, \$3.58 in 1914, and \$3.85 in 1909.

Only one state—Texas—reported a larger production of turpentine and rosin for 1919 than for 1914, the increase being 40.1 per cent for spirits of turpentine and 44.5 per cent for rosin.

For 1919 and 1914 the weight of a barrel of dip was reduced to an estimated weight of 500 pounds and that of scrape to 300 pounds. The weights reported ranged from 225 to 600 pounds and 180 to 600 pounds, respectively. In 1909 the weights reported ranged from 280 to 600 pounds for dip, and from 200 to 400 pounds for scrape, but as all the establishments did not report the weight per barrel, no attempt was made to reduce them to a uniform unit of measure.

Diameter of trees worked.—The diameter of the trees worked in 1919 by 870 out of the total number of 1,191 establishments is shown in Table 13.

Only 73 per cent of the total number of establishments reported this information, the percentage of the total number reported for each state being shown in column one of the table. While the data shown in this table are not complete, the tendency to bleed small timber for turpentine and rosin is clearly brought out.

TABLE 13.—DIAMETER OF TREES WORKED: 1919.

STATE.	Per cent of total number of establishments reporting.	DIAMETER (INCHES).					
		Virgin (first year).		Yearling (second year).		Pulling (third and subsequent years).	
		Minimum.	Average.	Minimum.	Average.	Minimum.	Average.
United States.....	73.0	9.0	13.3	9.3	13.0	9.2	13.6
Alabama.....	80.0	10.2	14.5	10.1	14.7	10.7	15.4
Florida.....	76.8	8.6	13.1	8.9	13.1	8.7	13.1
Georgia.....	73.7	8.5	12.7	9.0	13.0	9.0	13.0
Louisiana.....	39.4	10.6	18.3	10.8	18.5	10.6	18.1
Mississippi.....	62.2	10.8	16.1	10.7	16.3	10.4	15.8
North Carolina.....	7.1	10.0	17.0	.....	.....	10.0	17.0
South Carolina.....	45.5	12.5	13.3	12.8	15.8	8.0	14.0
Texas.....	70.0	10.4	17.2	10.7	17.3	10.3	17.3

GENERAL TABLES.

Comparative summary, 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 turpentine and rosin industry, are shown in Table 14.

Detailed statement, by states.—The principal general statistics secured by the census inquiry for 1919 for the turpentine and rosin industry are presented, by states, in Table 15.

TABLE 14.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Expressed in thousands.		
					Wages.	Cost of materials.	Value of products.
United States.....	1919	1,191	28,067	2,303	\$16,073	\$13,930	\$53,051
	1914	1,394	34,817	2,478	8,583	5,535	20,990
	1909	1,585	39,511	4,129	9,363	4,911	25,205
Alabama.....	1919	174	3,014	329	2,092	1,784	5,892
	1914	160	3,411	164	850	521	2,047
	1909	175	3,519	384	906	486	2,472
Florida.....	1919	452	11,748	904	6,833	5,859	21,509
	1914	508	15,466	913	4,015	2,584	9,573
	1909	593	18,143	1,916	4,316	1,969	11,937
Georgia.....	1919	441	7,078	783	4,178	2,944	10,875
	1914	562	9,118	1,158	2,101	1,173	4,608
	1909	592	12,787	1,407	2,831	1,260	6,939
Louisiana.....	1919	33	2,604	131	1,627	1,381	5,591
	1914	27	2,472	79	689	424	1,858
	1909	28	1,688	105	420	158	1,174
Mississippi.....	1919	45	2,495	78	1,574	\$1,290	\$5,548
	1914	61	3,275	108	669	586	1,997
	1909	64	2,573	286	581	349	1,475
North Carolina.....	1919	14	26	4	15	91	167
	1914	35	45	33	10	98	147
	1909	79	139	19	28	483	674
South Carolina.....	1919	22	84	10	48	63	168
	1914	35	221	2	42	57	152
	1909	56	443	2	101	164	406
Texas.....	1919	10	1,018	64	696	518	3,301
	1914	6	809	21	207	98	608
	1909	3	219	10	80	42	218

MANUFACTURES.

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, 093	1, 460	1, 347	214	5	28, 067	Ja 28, 802	Ja 25, 918	29, 001	29, 103	103	393	2	\$33, 595, 986
Alabama	174	3, 379	213	136	15	1	3, 014	Aug 3, 149	Ja 2, 784	3, 137	3, 107	11	18	1	1, 992, 090
Florida	452	13, 046	572	635	88	3	11, 748	Oct 12, 162	Ja 10, 582	12, 451	12, 114	84	302	1	15, 525, 831
Georgia	441	7, 971	590	286	17	.....	7, 078	July 7, 250	Ja 6, 763	7, 445	7, 422	11	12	.....	3, 693, 142
Louisiana	33	2, 771	4	124	38	1	2, 604	De 2, 835	Ja 2, 234	2, 815	2, 798	17	.....	.....	0, 271, 338
Mississippi	45	2, 656	39	96	26	.....	2, 495	Aug 2, 685	De 2, 189	2, 608	2, 540	30	38	.....	3, 471, 334
North Carolina	14	41	14	1	.....	.....	26	No 1 30	Ja 1 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	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.				Primary horsepower.					
	Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Owned.				Rented. ¹
												Steam engines.	Steam turbines.	Internal-combustion engines.	Water power. ²	
United States	\$2, 006, 441	\$236, 415	\$16, 072, 881	\$425, 407	\$34, 869	\$819, 459	\$13, 654, 976	\$274, 912	\$53, 051, 294	\$39, 121, 406	2, 303	1, 296	47	884	30	46
Alabama	213, 834	20, 125	2, 002, 190	37, 200	450	42, 282	1, 745, 901	38, 382	5, 892, 492	4, 108, 209	329	183	4	111	28	3
Florida	773, 283	92, 924	6, 832, 835	199, 837	19, 654	325, 539	5, 765, 424	103, 400	21, 508, 553	15, 649, 729	904	570	10	304	.....	20
Georgia	341, 353	15, 880	4, 177, 639	110, 517	13, 389	64, 459	2, 855, 868	88, 386	10, 874, 714	7, 930, 460	783	467	33	288	2	3
Louisiana	442, 591	51, 537	1, 627, 637	26, 175	600	128, 916	1, 364, 167	16, 521	5, 501, 289	4, 210, 601	131	10	.....	101	.....	20
Mississippi	131, 001	31, 979	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	86, 784	3, 624	167, 410	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	.....	.....

¹ Same number reported for one or more other months.² Includes water wheels and turbines (irrespective of ownership of water supply).³ Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).

WOOD DISTILLATION.

GENERAL STATISTICS.

General character of the industry.—This report embraces the establishments engaged primarily in the distillation of wood for the recovery of the volatile products, and the production of charcoal. Two distinct processes are employed—the destruction process and the steam process. In the former, the wood is heated to such a temperature that the fiber is destroyed and new products are created. In the latter process, 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. Softwood distillation is carried on largely in the South Atlantic and Gulf states. The southern longleaf pine is the principal raw material used in this industry.

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.

Comparative summary.—Table 1 presents the comparative statistics for the industry for the census years 1899 to 1919, inclusive, with percentages of increase for each census period.

Principal states, ranked by value of products.—Table 2 shows the number of establishments, wage earners, value of products, and value added by manufacture, by states, ranked according to value of products, 1919.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 3 is estimated by the method described in the "Explanation of terms." No wage earners under 16 years of age were reported. Figures for states will be found in Table 17.

Wage earners, by months.—The statistics for wage earners, Table 4, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. The few females reported are negligible.

Prevailing hours of labor.—In 1909, 96.4 per cent of the wage earners were employed in plants where the prevailing hours of labor per week were 60 or over, and in 1914, 88.5 per cent were of this class. The figures presented in Table 5 show progress toward a reduction in the hours of labor per week, the proportion for wage earners employed in establishments

where the prevailing hours of labor were 60 or more per week in 1919 having dropped to 69.3 per cent. On the other hand, in 1919, 14.9 per cent of the wage earners were in establishments where the hours of labor per week were fewer than 54, as compared with 3.7 per cent in 1914 and 1.8 per cent in 1909.

Size of establishments, by average number of wage earners.—The average number of wage earners per establishment increased from 29 in 1914 to 43 in 1919. Table 6 shows that 11 establishments employed over 100 wage earners in 1919, representing 38 per cent of all wage earners, as compared with 3 establishments and 13 per cent in 1914.

Size of establishments, by value of products.—A grouping by value of products is necessarily affected by the general increase in prices for 1919 as compared with 1914, and this accounts to a considerable extent for the changes from lower to higher groups, as shown in Table 7. During this census period there was an increase of 229.3 per cent in value of products, yet the increase in quantity production, based upon cords of wood distilled, was but 38.4 per cent, and the increase in average number of wage earners 77.8 per cent. The average value of products per establishment was \$81,000 in 1909, \$104,000 in 1914, and \$283,000 in 1919.

Character of ownership.—Table 8 presents the statistics for establishments classified according to form of ownership. Corporations operated 86.1 per cent of the plants and accounted for all but 2 per cent of the products.

Number and horsepower of types of prime movers.—Table 9 presents the power statistics for the industry for 1919, 1914, and 1909. Electric power is a growing factor, and of the total primary power capacity, 30.1 per cent were utilized in the form of electric power in 1919, this including electric motor equipment operated with purchased electric current, specified as rented, and secondary electric or that generated by the establishment, as compared with 26.2 per cent in 1914, and 5.9 per cent in 1909.

Fuel consumed.—Table 10 presents the statistics for certain specified fuels, namely, coal, anthracite and bituminous, fuel oils, gasoline, and gas, by kinds and by states, for 1919 and 1914. No coke was reported by the wood-distillation plants. In addition to the fuels shown in the table, considerable quantities of charcoal and tar, for which there was not a ready market, were used as fuel. Moreover, the consumption of wood as a fuel was not reported. The amount reported as expense for fuel and rent of power in 1919 was \$2,287,221, as compared with \$1,024,479 in 1914.

MANUFACTURES.

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

	1919	1914	1909	1904	1899	PER CENT OF INCREASE. ¹			
						1914-1919	1909-1914	1904-1909	1899-1904
Number of establishments.....	115	95	120	141	102	21.1	-20.8	-14.9	33.2
Persons engaged.....	5,634	3,142	3,095	2,655	(²)	79.3	1.5	16.6	.....
Proprietors and firm members.....	28	36	56	82	(²)	.....	.....	.....	.....
Salaried employees.....	660	324	318	301	235	103.7	1.9	5.6	23.1
Wage earners (average number).....	4,946	2,782	2,721	2,272	1,556	77.8	2.2	19.8	46.0
Primary horsepower.....	15,938	10,045	9,854	4,620	(²)	58.7	1.9	113.3	.....
Capital.....	\$42,334,503	\$17,562,849	\$13,017,192	\$10,506,979	\$6,729,127	141.0	34.9	23.9	56.1
Salaries and wages.....	6,032,256	1,968,011	1,818,059	1,364,314	913,509	237.0	8.2	33.3	49.3
Salaries.....	1,322,567	403,189	355,211	297,528	213,025	228.0	13.5	19.4	30.7
Wages.....	5,309,689	1,564,822	1,462,848	1,066,786	700,484	239.3	7.0	37.1	52.3
Paid for contract work.....	327,473	72,260	15,536	21,970	(²)	353.2	305.0	-29.3	.....
Rent and taxes.....	1,260,325	146,533	69,442	50,869	(²)	760.1	111.0	.....	.....
Cost of materials.....	20,059,651	6,495,570	5,875,851	4,847,770	3,455,015	208.8	10.5	21.2	40.3
Value of products.....	32,545,314	9,882,537	9,736,998	7,813,483	6,001,023	229.8	1.5	24.6	30.7
Value added by manufacture ⁴	12,485,663	3,386,967	3,861,147	2,965,713	2,546,008	268.6	-12.3	30.2	16.5

¹ A minus sign (-) denotes decrease; percentages not shown where base is less than 100 or where figures are not strictly comparable.² Figures not available.³ Exclusive of internal revenue.⁴ Value of products less cost of materials.

TABLE 2.—PRINCIPAL 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.....	115	4,946	100.0	.....	\$32,545	100.0	.....	\$12,486	100.0	.....
Michigan.....	16	1,586	32.1	1	10,651	32.7	1	4,858	38.9	1
Pennsylvania.....	44	1,211	24.5	2	5,542	17.0	3	2,288	18.3	2
Florida.....	6	412	8.3	4	2,005	6.2	5	909	7.3	5
Alabama.....	4	155	3.1	6	780	2.4	7	402	3.2	6
Louisiana.....	4	78	1.6	10	629	1.9	9	293	2.3	8
All other states.....	41	1,504	30.4	.....	12,938	39.8	.....	3,736	29.9	.....

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	5,634	5,514	120	97.0	2.1	Clerks and other subordinate salaried employees.	1919	289	204	85	70.6	29.4
	1914	3,142	3,108	34	98.9	1.1		1914	139	111	28	79.9	20.1
	1909	3,095	3,064	31	99.0	1.0		1909	119	94	25	79.0	21.0
Proprietors and officials.....	1919	399	392	7	98.2	1.8	Wage earners (average number).....	1919	4,946	4,918	28	99.4	0.6
	1914	221	215	6	97.3	2.7		1914	2,782	2,782	.....	100.0	.....
	1909	255	249	6	97.6	2.4		1909	2,721	2,721	.....	100.0	.....
Proprietors and firm members.....	1919	28	25	3	89.3	10.7	16 years of age and over.....	1919	4,946	4,918	28	99.4	0.6
	1914	36	32	4	88.9	11.1		1914	2,782	2,782	.....	100.0	.....
	1909	56	50	6	89.3	10.7		1909	2,721	2,721	.....	100.0	.....
Salaried officers of corporations.....	1919	128	124	4	96.9	3.1	Under 16 years of age.....	1919	4,946	4,918	28	99.4	0.6
	1914	76	74	2	97.4	2.6		1914	2,782	2,782	.....	100.0	.....
	1909	73	73	.....	100.0	.....		1909	2,721	2,721	.....	100.0	.....
Superintendents and managers.....	1919	243	243	100.0		1919
	1914	109	109	100.0		1914
	1909	123	126	100.0		1909

WOOD DISTILLATION.

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

(The month of maximum employment 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:														
1919.....	4,946	5,838	5,718	5,345	4,650	4,503	4,240	4,541	4,538	4,658	4,934	5,042	5,330	72.7
Males.....	4,918	5,809	5,691	5,316	4,621	4,476	4,217	4,514	4,510	4,630	4,907	5,014	5,311	72.6
Females.....	28	29	27	29	29	27	29	27	28	28	27	28	28	93.1
1914.....	2,782	3,531	3,359	2,887	2,552	2,463	2,453	2,434	2,607	2,664	2,721	2,787	2,926	68.9
1909.....	2,721	2,800	2,868	2,807	2,754	2,626	2,563	2,519	2,478	2,604	2,707	2,869	3,053	81.2
Alabama.....	155	151	143	139	136	137	153	151	148	152	174	192	184	70.8
Florida.....	412	346	354	382	390	404	389	457	436	445	426	412	503	68.8
Louisiana.....	78	77	77	77	77	77	78	78	79	79	79	79	79	97.5
Michigan.....	1,586	1,739	1,773	1,710	1,453	1,581	1,444	1,621	1,581	1,530	1,514	1,515	1,591	81.4
Pennsylvania.....	1,211	1,559	1,500	1,369	1,125	902	937	973	1,028	1,125	1,262	1,307	1,355	60.1

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

STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—							STATE.	Census year.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—						
			44 and under.	Between 44 and 48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.				44 and under.	Between 44 and 48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States:	1919	4,946	10	10	717	1	162	616	1,724	1,706									
	1914	2,782	(2)	(2)	103	8	208	1,221	1,242										
	1909	2,721	(2)	(2)	51	42	6	1,023	1,599										
Alabama.....	1919	155	10	22					123										
Florida.....	1919	412	2				344		66										
Louisiana.....	1919	78		3													52	23	.....
Michigan.....	1919	1,586		240												4	50	753	539
	1914	645															167	478	
Pennsylvania.....	1919	1,211		231												39	120	465	355
	1914	1,185	(2)	(2)	11											8		678	488

¹ Includes 48 and under for 1914 and 1909.² Corresponding figures not available.

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

STATE.		TOTAL.		ESTABLISHMENTS EMPLOYING—											
		Estab-lish-ments.	Wage earners (average number).	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.		Over 250 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	115	4,946	13	39	35	422	36	1,212	20	1,386	9	1,308	2	579
	1914	95	2,782	13	45	36	467	26	829	17	1,082	3	359	.....	.....
Alabama.....		4	155	1	2	2	18	1	22	1	59	1	115	.....	.....
Florida.....		6	412	1	2	2	14	.....	.....	1	337	.....	.....	.....	.....
Louisiana.....		4	78	2	8	1	18	.....	.....	1	52	.....	.....	.....	.....
Michigan.....		16	1,586	1	5	.....	.....	5	203	4	366	5	780	1	282
Pennsylvania.....		44	1,211	6	19	14	174	16	535	8	483	.....	.....	.....	.....

MANUFACTURES.

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.....	115	95	120	4,946	2,782	2,721	\$32,545,314	\$9,882,537	\$9,736,998	\$12,435,603	\$3,386,967	\$3,861,147
Less than \$5,000.....	4	5	8	8	12	35	6,538	14,116	22,670	2,331	8,638	10,279
\$5,000 to \$20,000.....	10	9	30	53	54	268	101,950	95,102	392,267	41,269	38,645	193,353
\$20,000 to \$100,000.....	41	54	61	788	1,082	1,216	2,185,198	2,764,619	3,111,998	884,783	953,720	1,296,796
\$100,000 to \$500,000.....	42	25		1,871			9,471,686			4,358,351		
\$500,000 to \$1,000,000.....	13	1	21	1,301	1,634	1,202	8,757,056	7,008,700	6,210,063	3,266,531	2,385,964	2,355,719
\$1,000,000 and over.....	5	1		.927			12,022,910			3,952,398		
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.....	3.5	5.3	6.7	0.1	0.4	1.3	(¹)	0.1	0.2	(¹)	0.3	0.3
\$5,000 to \$20,000.....	8.7	9.5	25.0	1.1	1.9	9.8	0.3	1.0	4.0	0.3	1.1	5.1
\$20,000 to \$100,000.....	35.7	56.8	50.8	15.9	38.9	44.7	6.7	28.0	32.0	6.9	28.2	33.6
\$100,000 to \$500,000.....	36.5	26.3		37.8			29.1			34.9		
\$500,000 to \$1,000,000.....	11.3	1.1	17.5	26.3	58.7	44.2	20.9	70.9	63.8	26.2	70.4	61.0
\$1,000,000 and over.....	4.3	1.1		18.7			36.9			31.7		

¹ Less than one-tenth of 1 per cent.

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

STATE.	Cen- sus year.	NUMBER OF ESTABLISH- MENTS OWNED BY—			AVERAGE NUMBER OF WAGE EARNERS.									VALUE OF PRODUCTS.								
		Indi- vid- uals.	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- uals.	Cor- pora- tions.	All oth- ers.	Indi- vid- uals.	Cor- pora- tions.	All oth- ers.		Indi- vid- uals.	Corpora- tions.	All oth- ers.	Indi- vid- uals.	Corpora- tions.	All oth- ers.				
United States.....	1919	9	90	7	4,946	164	4,600	92	3.3	94.8	1.9	\$32,545,314	\$483,553	\$31,887,648	\$174,113	1.5	98.0	0.5				
	1914	11	75	9	2,782	155	2,383	244	5.6	85.7	8.8	9,882,537	485,921	8,758,425	638,191	4.9	88.6	6.5				
	1909	14	92	14	2,721	275	2,215	231	10.2	81.4	8.5	9,736,998	648,470	8,414,986	673,533	6.7	86.4	6.9				
Alabama.....	1919	.....	4	.....	155	.....	155	.....	100.0	.....	.....	780,475	.....	780,475	.....	.....	100.0	.....			
Florida.....	1919	.....	6	.....	412	.....	412	.....	100.0	.....	.....	2,004,931	.....	2,004,931	.....	.....	100.0	.....			
Louisiana.....	1919	.....	4	.....	78	.....	78	.....	100.0	.....	.....	629,022	.....	629,022	.....	.....	100.0	.....			
Michigan.....	1919	.....	16	.....	1,586	.....	1,586	.....	100.0	.....	.....	10,651,181	.....	10,651,181	.....	.....	100.0	.....			
	1914	.....	10	.....	645	.....	645	.....	100.0	.....	.....	2,678,151	.....	2,678,151	.....	.....	100.0	.....			
Pennsylvania.....	1919	4	36	4	1,211	70	1,117	24	5.8	92.2	2.0	5,542,215	334,392	5,129,911	77,912	6.0	92.6	1.4				
	1914	4	34	8	1,185	33	912	240	2.8	77.0	20.3	3,417,199	100,505	2,680,503	636,191	2.9	78.4	18.7				

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

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.					
				Amount.			Per cent distribution.		
	1919	1914	1909	1919	1914	1909	1919	1914	1909
Primary power, total.....	401	256	226	15,938	10,045	9,854	100.0	100.0	100.0
Owned.....	254	237	224	13,655	9,110	9,779	85.7	90.7	99.2
Steam ¹	209	188	170	12,736	8,230	9,056	79.9	81.9	91.9
Engines.....	198	188	170	10,284	8,230	9,056	64.3	81.9	91.9
Turbines.....	11	(²)	(²)	2,482	(²)	(²)	15.6	(²)	(²)
Internal-combustion engines.....	35	33	25	810	741	462	5.1	7.4	4.7
Water wheels and turbines.....	10	16	29	109	139	261	0.7	1.4	2.6
Rented.....	147	19	2	2,283	935	75	14.3	9.3	0.8
Electric.....	147	19	2	1,533	935	75	9.6	9.3	0.8
Other.....				750			4.7		
Electric.....	291	128	39	4,811	2,630	580	100.0	100.0	100.0
Rented.....	147	19	2	1,533	935	75	31.9	35.6	12.9
Generated by establishments reporting.....	144	109	37	3,278	1,695	505	68.1	64.4	87.1

¹ Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.² Not reported separately.

WOOD DISTILLATION.

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TABLE 10.—FUEL CONSUMED, BY STATES: 1919.

STATE.	Cen- sus year.	COAL.		Fuel oils (bar- rels).	Gasoline and other volatile oils (bar- rels).	Gas (1,000 cubic feet).
		Anthra- cite (tons, 2,240 pounds).	Bitumi- nous (tons, 2,000 pounds).			
United States.....	1919	40,677	308,747	56,445	10,814	1,798,302
	1914	38,994	196,594	18	(1)	1,521,666
Alabama.....	1919		938		4,403	
Florida.....	1919		3,579	22,467	6,174	
Louisiana.....	1919		4,235		2	
Michigan.....	1919	7,000	105,189			6
	1914	4,600	47,103	3	(1)	3,235
Pennsylvania.....	1919	9,260	96,818	17,800	12	1,798,249
	1914	4,795	107,150			1,431,016
All other states.....	1919	24,417	97,988	18,178	223	47
	1914	29,599	42,341	15	(1)	87,415

¹ Included with figures for fuel oils.

SPECIAL STATISTICS.

Materials.—The schedule employed in the canvass of the industry called for quantity and kind of wood used and the quantity and cost of crude alcohol purchased in cases where crude alcohol was purchased for refining.

Table 11 gives the data for cost of all materials and details for wood and alcohol for 1919, 1914, 1909, and 1904.

TABLE 11.—MATERIALS: 1919, 1914, 1909, AND 1904.

MATERIAL.	1919	1914	1909	1904
Total cost.....	\$20,059,651	\$6,495,570	\$5,875,851	\$4,847,770
Wood, cords.....	1,442,675	1,042,517	1,265,157	1,049,503
Hardwoods—				
Cords.....	1,188,477	970,308	1,149,847	1,018,072
Cost.....	\$7,965,069	(2)	(2)	(2)
Softwood (pine)—				
Cords.....	256,198	72,209	115,310	31,431
Cost.....	\$1,593,977	(2)	(2)	(2)
Crude wood alcohol:				
Purchased—				
Gallons.....	7,360,390	5,665,446	7,135,614	(1)
Cost.....	\$5,898,175	\$1,408,124	\$1,784,029	(1)
Made and consumed, gallons.....	2,123,303	2,405,466	2,534,883	1,468,028

¹ Includes 540 cords, cost \$6,893, consumed in the manufacture of subsidiary wood-distillation products in other industries, not included in above total.

² Figures not available.

Wood consumed in distillation.—Table 12 gives the consumption of wood in distillation, by states, by all establishments, primary and subsidiary, for 1919. Beech, birch, and maple are the principal hardwoods for which returns are available. A few other species have been used from time to time, but they are of less importance, and in many instances were not reported separately, namely: Alder, ash, cherry, chestnut, elm, gum, hickory, ironwood, oak, and a few others not specified. The principal softwood is the

longleaf pine, although other resinous woods have been used in limited quantities.

TABLE 12.—WOOD CONSUMED IN DISTILLATION, BY STATES: 1919.

STATE.	Num- ber of estab- lish- ments.	QUANTITY.		Cost.	Av- erage cost per cord.
		Cords.	Per cent distri- bution.		
Total.....		1,442,675		\$9,559,040	\$6.63
Hardwoods.....	87	1,188,477	100.0	7,965,069	6.71
Michigan.....	15	648,910	54.7	4,307,797	6.04
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 ¹	7	91,210	7.7	507,464	5.56
Softwoods.....	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 ²	4	18,005	7.0	95,788	5.32
All other states ³	5	6,748	2.6	52,958	7.85

¹ All other states embrace: Alabama, 1 establishment; Connecticut, 1; Kentucky, 1; Mississippi, 1; Missouri, 1; Tennessee, 1; and West Virginia, 1.

² Includes 1 establishment distilling sawdust.

³ All other states embrace: Michigan, 1 establishment; Mississippi, 1; North Carolina, 2; and Texas, 1.

Products.—Table 13 gives comparative statistics of products for the years 1919, 1914, 1909, and 1904. The principal basic products obtained from the hardwoods by distillation are crude wood alcohol, charcoal, acetate, 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 portion of the charcoal—26 per cent in 1919—was the product of plants operated in conjunction with charcoal iron blast furnaces, in Michigan, Wisconsin, and Connecticut.

TABLE 13.—DETAILED STATISTICS OF QUANTITY AND VALUE:
1919, 1914, 1909, AND 1904.

PRODUCT.	1919	1914	1909	1904
Total value.....	\$32,625,305	\$10,529,829	\$10,312,657	\$9,037,313
The wood-distillation industry...	\$32,545,314	\$9,882,537	\$9,736,998	\$7,813,438
Subsidiary wood-distillation products of other industries.....	\$79,991	\$647,292	\$575,659	\$1,223,830
Wood alcohol:				
Crude, gallons.....	9,103,906	9,602,431	9,307,583	8,282,286
For sale—				
Gallons.....	6,980,693	7,199,975	6,772,700	6,814,258
Value.....	\$5,593,509	\$1,005,880	\$1,774,459	\$2,201,961
Average unit value, gallon.....	\$0.80	\$0.22	\$0.26	\$0.32
Made and consumed, gallons.....	2,123,303	2,405,456	2,534,883	1,468,028
Refined, gallons.....	7,391,010	6,464,955		
For sale—				
Gallons.....	6,984,668	6,235,113	6,732,577	5,917,153
Value.....	\$8,381,663	\$2,709,369	\$3,090,808	\$3,455,625
Average unit value, gallon.....	\$1.20	\$0.43	\$0.46	\$0.58
Made and consumed, gallons.....	406,342	229,842	(¹)	(¹)
Acetate of lime, pounds.....	168,956,432	166,084,523	(¹)	(¹)
For sale—				
Pounds.....	153,910,349	163,521,577	141,478,296	110,383,997
Value.....	\$2,682,232	\$2,138,909	\$2,118,443	\$1,527,733
Average unit value, pound.....	1.74 cents.	1.31 cents.	1.5 cents.	1.4 cents.
Made and consumed, pounds.....	15,046,083	2,562,946	(¹)	(¹)
Formaldehyde, acetic acid, acetone, methyl acetone, acetone oil, ketone, and acetate of soda, in order named, value.....	\$2,076,322	(¹)	(¹)	(¹)
Tar, gallons.....	2,677,881	2,965,354	(¹)	(¹)
For sale—				
Gallons.....	2,143,157	1,476,797	1,570,257	(¹)
Value.....	\$481,820	\$145,984	\$113,225	(¹)
Made and consumed, gallons.....	534,724	1,488,557	(¹)	(¹)
Tar oils:				
Gallons.....	803,440	(¹)	(¹)	(¹)
Value.....	\$240,305	(¹)	(¹)	(¹)
Wood creosote:				
Pounds.....	1,152,655	2,073,057	2,549,190	(¹)
Value.....	\$31,957	\$38,872	\$34,645	(¹)
Turpentine:				
Gallons.....	1,534,333	575,557	706,868	442,185
Value.....	\$1,207,739	\$194,183	\$249,526	\$176,521
Rosin:				
Barrels (280 pounds).....	234,030	51,825	(¹)	(¹)
Value.....	\$2,742,552	\$108,165	(¹)	(¹)
Charcoal:				
Total production, bushels..	48,210,497	(¹)	(¹)	(¹)
For sale—				
Bushels.....	35,594,160			
Value.....	\$5,304,638	44,827,836	39,952,235	29,917,212
Blast furnace consumption—		\$2,829,571	\$2,426,048	\$1,487,165
Bushels.....	12,455,052			
Value.....	\$2,916,737			
Made and consumed, bushels..	161,285	(¹)	(¹)	(¹)
Other wood-distillation products, value.....	\$412,541	\$441,399	\$231,192	\$138,481
All other products, value.....	\$552,590	\$227,497	\$267,711	\$40,827

¹ Figures not available.

Products, by principal states.—Table 14 shows the production of the principal products, by states, for 1919 and 1914.

TABLE 14.—PRODUCTS, BY PRINCIPAL STATES: 1919 AND 1914.

STATE.	1919		1914	
	Quantity.	Value.	Quantity.	Value.
Wood alcohol, refined (for sale)...	<i>Gallons.</i>		<i>Gallons.</i>	
Michigan.....	6,984,668	\$8,381,663	6,235,113	\$2,709,369
Pennsylvania.....	1,580,282	1,790,421	1,570,058	588,908
All other states.....	5,404,336	6,591,442	4,604,455	2,120,461
Wood alcohol, crude (for sale)....				
Pennsylvania.....	6,980,693	5,593,509	7,199,975	1,605,880
Michigan.....	2,526,429	1,968,805	4,235,636	904,700
Pennsylvania.....	2,282,790	1,831,729	1,593,134	364,507
All other states.....	2,171,474	1,754,975	1,308,205	336,673
Acetate of lime.....	<i>Pounds.</i>		<i>Pounds.</i>	
Michigan.....	153,910,349	2,682,232	163,521,577	2,138,909
Pennsylvania.....	64,611,564	1,068,496	57,756,234	718,753
Pennsylvania.....	52,322,435	906,337	77,140,287	1,043,636
All other states.....	36,976,350	682,399	28,625,056	376,520
Charcoal.....	<i>Bushels.</i>		<i>Bushels.</i>	
Pennsylvania.....	35,594,160	5,304,638	44,827,836	2,829,571
Michigan.....	12,379,527	1,858,620	17,726,774	1,318,109
Michigan.....	11,730,953	1,746,597	19,152,454	960,414
All other states.....	11,474,680	1,699,421	7,948,608	551,048

Equipment.—Table 15 presents the statistics for equipment, retorts, ovens, kilns, and steam extractors, by states, for 1919. 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 pits. This kind of equipment is still being used, 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.

TABLE 15.—EQUIPMENT: 1919.

STATE.	RETORTS AND OVENS.		KILNS.		STEAM EXTRACTORS.	
	Num. ber.	Total capacity, cords per day.	Num. ber.	Total capacity, cords per charge.	Num. ber.	Total capacity, cords per day.
United States.....	1,087	5,148	167	10,070	132	870
Hardwood distillation.....	860	4,614	167	10,070	.....	.....
Michigan.....	180	1,282	130	8,200	.....	.....
New York.....	235	665	.....	.....	.....	.....
Pennsylvania.....	373	1,998	12	120	.....	.....
Wisconsin.....	10	82	25	1,750	.....	.....
All other states ¹	62	587	.....	.....	.....	.....
Softwood distillation.....	207	534	.....	.....	132	870
Alabama.....	20	10	.....	.....	60	150
Florida.....	29	100	.....	.....	40	320
Georgia.....	76	306	.....	.....	22	363
Louisiana.....	32	40	.....	.....	8	17
All other states ²	50	78	.....	.....	2	20

¹ Includes Alabama, Connecticut, Kentucky, Mississippi, Missouri, Tennessee, and West Virginia.

² Includes Michigan, Mississippi, North Carolina, and Texas.

GENERAL TABLES.

Table 16 gives the comparative statistics for the principal items, number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products for the census years 1919, 1914, and 1909. Table 17 is a detailed statement, by states, for the census of 1919.

TABLE 16.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Cen- sus year.	Num- ber of estab- lish- ments.	Wage earners (aver- age num- ber).	Pri- mary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.	STATE.	Cen- sus year.	Num- ber of estab- lish- ments.	Wage earners (aver- age num- ber).	Pri- mary horse- power.	Wages.	Cost of mate- rials.	Value of prod- ucts.
United States.....	1919	115	4,946	15,938	\$5,310	\$20,060	\$32,545	Pennsylvania	1919	44	1,211	2,569	\$1,273	\$3,254	\$5,542
	1914	95	2,782	10,045	1,565	6,496	9,883		1914	46	1,185	2,514	682	2,218	3,417
	1909	120	2,721	9,854	1,463	5,876	9,737		1909	50	933	1,749	522	1,684	2,960
Michigan.....	1919	16	1,588	5,985	1,988	5,793	10,651	All other states	1919	55	2,149	7,384	2,049	11,013	16,352
	1914	10	645	2,644	415	1,708	2,678		1914	39	952	4,887	408	2,570	3,788
	1909	12	806	5,012	504	1,155	2,399		1909	58	982	3,093	437	3,037	4,378

TABLE 17.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY.								WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY.						EXPENSES.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Average number.	Wage earners.		Total.	16 and over.		Under 16.		Capital.	Salaries and wages.	
					Male.	Female.		Maximum month.	Minimum month.		Male.	Female.	Male.	Female.		Officials.	Clerks, etc.
United States....	115	5,634	28	371	204	85	4,946	Ja 5,838	Je 4,246	5,463	5,437	26	.....	\$42,334,503	\$950,476	\$372,091
Alabama.....	4	188	.....	17	10	6	155	No 192	Ap 136	184	182	2	.....	660,446	33,687	19,374
Florida.....	6	479	.....	32	26	9	412	De 503	Ja 346	346	346	.....	.....	1,838,182	91,009	42,670
Louisiana.....	4	91	.....	10	1	2	78	De 1 79	Ja 1 77	79	79	.....	.....	247,800	29,715	2,500
Michigan.....	16	1,764	.....	72	69	37	1,586	Fe 1,773	Je 1,444	1,591	1,591	.....	.....	15,381,952	210,463	153,026
Pennsylvania.....	44	1,401	16	126	31	17	1,211	Ja 1,559	Je 937	1,475	1,473	2	.....	9,821,100	263,250	39,655
All other states 2.....	41	1,711	12	114	67	14	1,504	.....	.....	1,788	1,766	22	.....	14,385,023	322,352	113,966

STATE.	EXPENSES—continued.						Value of products.	Value added by manufacture.	POWER.						
	Salaries and wages—Con	For contract work.	Rent and taxes.		For materials.				Primary horsepower.					Electric horse-power generated in establishments reporting.	
			Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Owned.					
										Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.3	Rent- ed.4	
United States....	\$5,300,680	\$327,473	\$22,638	\$1,237,687	\$17,772,430	\$2,287,221	\$32,545,314	\$12,485,063	15,938	10,254	2,482	810	109	2,283	3,278
Alabama.....	145,200	.....	.....	9,034	353,003	25,926	780,475	401,546	411	308	.....	.....	.....	103	.....
Florida.....	400,086	.....	.....	28,050	966,441	120,066	2,004,931	909,424	1,837	1,731	.....	.....	.....	.....	392
Louisiana.....	82,040	.....	915	41,042	314,633	21,452	629,022	292,937	82	80	62	44	2	.....	60
Michigan.....	1,988,414	267,213	600	587,044	5,056,143	737,305	10,651,181	4,857,733	5,985	3,829	150	.....	.....	2,006	570
Pennsylvania.....	1,273,417	50,993	10,133	374,851	2,604,226	649,699	5,542,215	2,288,290	2,569	1,657	35	699	104	74	424
All other states 2.....	1,420,532	9,267	10,990	197,666	8,477,984	723,773	12,937,490	3,735,733	5,054	2,649	2,235	65	5	100	1,832

¹ Same number reported for one or more other months.

² All other states embrace: Georgia, 7 establishments; Kentucky, 1; Mississippi, 2; Missouri, 1; New Jersey, 1; New York, 21; North Carolina, 2; Tennessee, 1; Texas, 1; West Virginia, 1; Wisconsin, 3.

³ Includes water wheels and turbines (irrespective of ownership of water supply).

⁴ Chiefly electric motors operated by rented (or purchased) current; other power included (chiefly shaft-belt or transmitted power from neighboring power plants).