CHEMICALS AND ALLIED PRODUCTS

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CHEMICALS AND ALLIED INDUSTRIES—THE INDUSTRIAL GROUP.

Closely associated with chemicals, as generally understood, are a number of products which at some prior censuses were included in the chemical industry and which now are the subjects of separate reports. These industries are here considered as an industrial group, namely: (1) Chemicals; (2) Coal-tar products; (3) Bone, carbon, and lamp black; (4) Dyestuffs and extracts; (5) Essential oils; (6) Explosives; (7) Fertilizers; (8) Paint and varnish; (9) Sulphuric, nitric, and mixed acids; and (10) Wood distillation.

Somewhat akin to the foregoing are Coke and Salt, industries which supply important basic materials for the industrial group. These are not included in the group "Chemicals and allied industries" given below, but they appear as separate sections following the group "Chemicals; Sulphuric, nitric, and mixed acids; and Coal-tar products."

Summary for the group.—Table 1 summarizes the statistics for the several industries constituting the chemical group. Ranked by value of products, the constituent industries line up in the following order: Chemicals, with 30.9 per cent of the value of all products for the group; paint and varnish, 24 per cent; fertilizers, 19.8 per cent; coal-tar products, 9.6 per cent; explosives, 6.5 per cent; dyestuffs and extracts, 3.8 per cent; wood distillation, 2.3 per cent; sulphuric, nitric, and mixed acids, 2.2 per cent; bone, carbon, and lamp black, four-tenths of 1 per cent; and essential oils, four-tenths of 1 per cent.

TABLE 1.—COMPARATIVE SUMMARY, CHEMICALS AND ALLIED INDUSTRIES: 1919 AND 1914.

	Total.	Chemicals.	Coal-tar products.	Bone, carbon, and lamp black.	Dyestuffs and extracts.	Essential oils.	Explosives.	Fertilizers.	Paint and varnish.	Sulphuric, nitric, and mixed acids.	Wood distillation.
Number of establishments:											
1919	2,740	598	183	35	144	78	118	600	880	39	115
1914	2,461	395	(1)	27	112	105	111	784	800	32	95
Per cent of increase [2]	11.3	97.7		29.6	28.6	−25.7	6.3	−23.5	3.8	21.9	21.1
Persons engaged:											
1919	188,489	66,947	21,543	826	5,205	493	15,429	32,522	34,030	5,860	5,634
1914	111,458	37,881	(1)	437	3,551	435	8,425	28,301	25,682	3,604	3,142
Per cent of increase	69.1	133.6		89.0	46.6	13.3	83.1	14.9	32.5	62.6	79.3
Proprietors and firm members—											
1919	884	122	26	30	59	74	28	219	298	.....	28
1914	1,108	99	(1)	17	56	116	20	373	391	.....	36
Per cent of increase [2]	−20.2	49.5		76.5	5.4	−36.2	40.0	−41.3	−23.8	.....	−22.2
Salaried employees—											
1919	44,059	11,239	5,854	121	804	98	6,152	6,007	12,225	899	660
1914	23,562	5,471	(1)	81	656	70	2,099	5,113	9,208	540	324
Per cent of increase	87.0	212.4		49.4	22.6	40.0	193.1	17.5	32.8	66.5	103.7
Wage earners (average number)—											
1919	143,546	55,586	15,663	675	4,342	321	9,249	26,296	21,507	4,961	4,946
1914	86,788	32,311	(1)	339	2,839	249	6,306	22,815	16,083	3,064	2,782
Per cent of increase	65.4	120.5		99.1	52.9	28.9	46.7	15.3	33.7	61.9	77.8
Primary horsepower:											
1919	792,640	376,940	68,342	1,857	34,320	1,833	51,635	125,939	85,199	30,637	15,938
1914	575,442	282,385	(1)	1,816	23,290	2,309	45,778	114,281	70,611	24,927	10,045
Per cent of increase [2]	37.7	37.7		2.3	47.4	−20.6	12.8	10.2	20.7	22.9	58.7
Capital:											
1919	$1,492,400,668	$484,488,412	$174,991,835	$9,790,167	$38,689,058	$6,379,910	$133,247,084	$311,633,259	$239,775,836	$51,160,004	$42,334,503
1914	$722,988,871	$224,345,921	(1)	$4,995,400	$21,283,974	$1,616,682	$71,351,414	$217,064,890	$129,533,935	$35,233,806	$17,562,849
Per cent of increase	106.4	194.0		96.0	81.8	294.6	86.7	43.6	85.1	45.2	141.0
Salaries and wages:											
1919	$271,273,449	$97,188,958	$35,235,209	$1,120,718	$7,055,528	$620,003	$25,749,210	$36,934,732	$50,640,787	$10,096,048	$6,632,256
1914	$89,653,331	$31,086,915	(1)	$336,001	$3,001,959	$238,607	$7,795,623	$17,774,447	$24,369,021	$3,082,747	$1,968,011
Per cent of increase	202.6	326.0		233.5	135.0	159.8	230.3	107.8	107.8	227.5	237.0
Salaries—											
1919	$93,876,329	$24,340,634	$11,833,069	$312,386	$2,320,914	$228,790	$13,244,224	$11,571,600	$26,522,628	$2,179,517	$1,322,567
1914	$36,631,960	$9,020,703	(1)	$105,180	$1,388,843	$105,335	$3,307,335	$7,242,442	$14,188,733	$370,200	$403,189
Per cent of increase	156.3	301.0		197.0	67.1	117.2	300.5	59.8	86.9	150.5	228.0
Wages—											
1919	$177,397,120	$72,848,324	$23,402,140	$808,332	$4,734,614	$391,213	$12,504,986	$25,363,132	$24,118,159	$7,916,531	$5,309,689
1914	$53,021,371	$22,066,212	(1)	$230,821	$1,613,116	$133,272	$4,488,288	$10,532,005	$10,180,288	$2,212,547	$1,564,822
Per cent of increase	234.6	336.2		250.2	193.5	193.5	178.6	140.8	136.9	257.8	239.3
Paid for contract work:											
1919	$3,758,033	$1,321,738	$896,830	$4,500	$225,880	$2,000	$30,542	$171,318	$729,885	$47,867	$327,473
1914	$750,453	$375,435	(1)	$350	$2,487	$1,500	$7,645	$192,859	$91,602	$6,315	$72,260
Per cent of increase [2]	400.8	490.9		1,185.7	8,982.4	33.3	299.5	−11.2	696.8	658.0	353.2
Rent and taxes:											
1919	$62,762,444	$32,528,130	$5,442,111	$177,186	$2,521,380	$148,658	$2,737,975	$8,475,314	$8,399,760	$1,071,605	$1,260,325
1914	$5,599,664	$1,733,251	(1)	$21,995	$225,582	$14,106	$322,132	$1,271,417	$1,647,370	$217,278	$146,533
Per cent of increase	1,020.8	2,090.7		705.6	1,017.7	953.9	750.0	566.6	409.9	393.2	760.1
Cost of materials:											
1919	$805,623,142	$216,301,279	$63,996,734	$2,848,059	$34,592,698	$3,903,417	$45,911,049	$185,040,522	$217,112,372	$15,857,361	$20,059,651
1914	$340,216,702	$89,450,694	(1)	$686,240	$13,237,995	$1,564,835	$25,626,539	$107,954,644	$88,465,757	$6,734,428	$6,495,570
Per cent of increase	136.8	213.4		315.0	161.3	149.4	79.2	71.4	145.4	135.5	208.8
Value of products:											
1919	$1,417,750,917	$438,658,869	$135,482,161	$6,186,204	$53,744,283	$5,698,403	$92,474,813	$281,143,587	$340,346,803	$31,470,480	$32,545,314
1914	$547,801,937	$158,053,602	(1)	$1,463,569	$20,620,336	$2,313,606	$41,432,970	$153,196,152	$145,623,691	$15,215,474	$9,882,537
Per cent of increase	158.8	263.3		322.7	160.6	146.3	123.2	83.5	133.7	106.8	229.3
Value added by manufacture: [3]											
1919	$611,317,775	$222,357,590	$71,485,427	$3,338,145	$19,151,585	$1,794,986	$46,563,764	$96,103,065	$123,234,431	$15,613,119	$11,675,663
1914	$207,585,235	$68,602,908	(1)	$777,329	$7,382,341	$748,771	$15,806,431	$45,241,508	$57,157,934	$8,481,046	$3,386,967
Per cent of increase	194.5	328.3		329.4	159.4	139.7	194.6	112.4	115.6	84.1	244.7

[1] Included in "Chemicals" in 1914. [2] A minus sign (−) denotes decrease. [3] Value of products less cost of materials.

CHEMICALS.

GENERAL STATISTICS.

General character of the industry.—The industry, "chemicals," according to the census classification, embraces establishments engaged in the manufacture of products grouped under the following heads: I, Acids; II, Ammonium and cyanogen compounds; III, Sodas, sodium, and compounds; IV, Potash, potassium, and compounds; V, Alums, aluminum, and compounds; VI, Bleaching compounds; VII, Coal-tar chemicals; VIII, Plastics; IX, Compressed and liquefied gases; and X, Chemicals, not elsewhere specified.

This classification does not include all chemicals in the broad sense of the word, as some are included under distinctive titles. Establishments engaged primarily in the manufacture of sulphuric acid, nitric acid, or mixed acid are segregated under the title "Sulphuric, nitric, and mixed acids," and coal-tar chemicals under "Coal-tar products." However, in presenting the statistics for a specific chemical product, the information given, unless otherwise stated, refers to total production, irrespective of the classification of the producing establishment.

Comparative summary.—Table 2 presents the comparative statistics for the census years 1899 to 1919, inclusive, for the chemical industry, with percentages of increase for the respective census periods.

Principal states, ranked by value of products.—Table 3 summarizes the more important statistics for the industry, by states, ranked according to value of products. Though establishments were reported from 38 states, including the District of Columbia, the industry is largely centralized; New York, New Jersey, and Pennsylvania, constituting the Middle Atlantic division, reporting 55.9 per cent of the products, 52.7 per cent of the wage earners, and 222 establishments, or 37.1 per cent of the total number.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 4, is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 36. The female wage earners increased from 4.5 per cent of all wage earners in 1909 to 5.3 per cent in 1914 and to 8.3 per cent in 1919; and in the case of clerks and other subordinate salaried employees, females constituted 34.5 per cent in 1919 as compared with 16.7 per cent in 1909.

Wage earners, by months.—Table 5 is designed to show the regularity of employment, or the reverse, in accordance with the industrial conditions existing during the census year. Females constituted 8.5 per cent of the average number of wage earners in 1919. The statistics show a somewhat greater range between the minimum and maximum months in 1919 than was the case with the earlier censuses, the number reported for the minimum month, May, in 1919, being 84 per cent of the number reported for the maximum month, January. In 1914 the minimum month was 97.1 per cent of the maximum month, and in 1909, 90.2 per cent. Of the states reporting 1,000 or more wage earners, the monthly fluctuation ranged from 66.5 per cent, minimum month of maximum month, for Indiana and Michigan, to 95.2 per cent for Missouri.

Prevailing hours of labor.—The statistics in Table 6 show a very marked movement toward shorter hours of labor. In 1909, 56.2 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were 60 or more, and in 1914 51.3 per cent were within this class. In 1919, however, the proportion dropped to 13.9 per cent. On the other hand, in 1909 the number employed in establishments where the prevailing hours of labor per week were 48 or less was negligible, only four-tenths of 1 per cent; and in 1914 the number so employed was 2.9 per cent, but in 1919, 38.4 per cent of the wage earners came within this group.

Size of establishments, by average number of wage earners.—In 1914 the establishments averaged 82 wage earners per establishment, and in 1919, 93 wage earners. In 1914 there were 17 establishments each of which employed over 500 wage earners, the number constituting 52.1 per cent of all wage earners in the industry. In 1919 Table 7 shows that the number of establishments of this class had increased to 28, and the wage earners constituted 57.7 per cent of the total.

Size of establishments, by value of products.—The grouping based upon value of products in Table 8 is necessarily affected by the general increase in values since the census of 1914, and this rise is reflected in the changes from lower to higher groups, as well as in the increase in average value of products per establishment. In 1909 the establishments averaged $328,000 in value of products, in 1914, $400,000, and in 1919, $734,000; the increase from 1914 to 1919 being to a considerable extent due to the increase in values, for though the increase in value of products for all establishments for the period 1914–1919 was 177.5 per cent, the increase in average number of wage earners, an index of normal growth, was but 72 per cent.

Character of ownership.—Table 9 presents statistics concerning the character of ownership, or legal organization, of establishments in the industry for 1919, 1914, and 1909, and for the leading states for 1919 and 1914. The figures show growth for the corporation group, and although establishments under other forms of ownership still constitute a considerable number, the corporations account for 98.7 per cent of the products and 99.1 per cent of the wage earners.

Number and horsepower of types of prime movers.—Table 10 presents the power statistics for the industry. There is shown a material increase in electric power. Though the equipment operated with purchased electric current in 1919 is somewhat less in rated capacity than in 1914, yet the motor equipment using current generated by the establishment from prime movers, was materially greater, and in the aggregate the electric power equipment was equal in capacity to 62.6 per cent of the total primary power rating in 1919, as compared with 61.1 per cent in 1914 and 75.1 per cent in 1909.

Fuel consumed.—Table 11 presents the statistics for fuel consumed, by kinds and by states, for 1919 and for 1914. The figures for gas include both natural and manufactured gas.

TABLE 2.—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	598	395	359	297	316	51.4	10.0	20.9	−6.0
Persons engaged	66,947	37,881	27,817	22,792	(2)	76.7	36.2	22.0	.....
Proprietors and firm members	122	99	161	151	(2)	23.2	−38.5	6.6	.....
Salaried employees	11,239	5,471	3,927	2,794	1,596	105.0	39.3	40.6	75.1
Wage earners (average number)	55,586	32,311	23,729	19,847	15,163	72.0	36.2	19.6	30.9
Primary horsepower	376,940	282,385	208,657	132,394	(2)	33.5	35.3	57.6	.....
Capital	$484,488,412	$224,345,921	$155,198,945	$96,764,847	$68,453,931	116.0	44.6	60.4	41.4
Salaries and wages	97,188,958	31,086,915	20,236,551	14,873,791	9,717,475	213.0	53.6	36.1	53.1
Salaries	24,340,634	9,020,703	6,140,628	4,060,033	2,327,854	170.0	46.9	51.2	74.4
Wages	72,848,324	22,066,212	14,095,923	10,813,758	7,389,621	230.0	56.5	30.4	46.3
Paid for contract work	1,321,738	375,435	181,011	155,558	(2)	252.0	107.4	16.4	.....
Rent and taxes	32,528,130	1,733,251	860,490	[3] 545,264	(2)	1,777.0	101.4	.....	.....
Cost of materials	216,301,279	89,450,694	64,145,429	42,097,957	27,092,591	142.0	39.4	52.4	55.4
Value of products	438,658,869	158,053,602	117,741,103	75,357,495	48,158,261	178.0	34.2	56.2	56.5
Value added by manufacture[4]	222,357,590	68,602,908	53,595,674	33,259,538	21,065,670	224.0	28.0	61.1	57.9

[1] A minus sign (−) denotes decrease. [2] Figures not available. [3] Exclusive of internal revenue. [4] Value of products less cost of materials.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	598	55,586	100.0	....	$438,659	100.0	....	$222,358	100.0	...
New York	88	9,687	17.4	2	88,102	20.0	1	37,230	16.7	3
New Jersey	78	12,472	22.4	1	84,034	19.2	2	38,860	17.5	2
Pennsylvania	56	7,134	12.8	3	73,333	16.7	3	46,552	20.9	1
Michigan	36	5,712	10.3	4	37,851	8.6	4	22,107	9.9	4
Ohio	37	3,670	6.6	5	32,719	7.5	5	17,424	7.8	5
Illinois	33	3,004	5.4	6	22,061	5.0	6	10,058	4.5	6
Massachusetts	27	2,483	4.5	7	17,305	4.0	7	9,204	4.1	7
Missouri	22	1,253	2.3	10	13,538	3.1	8	5,821	2.6	9
Virginia	12	1,847	3.3	8	12,765	2.9	9	9,060	4.1	8
California	49	1,466	2.6	9	10,539	2.4	10	4,409	2.0	11
Indiana	9	1,026	1.9	12	8,649	2.0	11	4,679	2.1	10
Maryland	8	797	1.4	13	5,277	1.2	13	2,079	0.9	13
West Virginia	7	534	1.0	15	3,281	0.7	14	1,158	0.5	14
Nebraska	12	300	0.5	18	$2,305	0.5	16	$1,335	0.6	15
Wisconsin	30	187	0.3	20	2,074	0.5	17	945	0.4	18
Utah	8	454	0.8	16	1,709	0.4	19	922	0.4	19
Minnesota	9	162	0.3	21	1,456	0.3	20	832	0.4	20
Rhode Island	4	287	0.5	19	1,399	0.3	21	454	0.2	25
Texas	9	150	0.3	22	1,394	0.3	22	822	0.4	22
Washington	8	90	0.2	25	1,363	0.3	23	828	0.4	21
Colorado	7	98	0.2	24	1,301	0.3	24	667	0.3	23
Georgia	7	107	0.2	23	957	0.2	25	578	0.3	24
Iowa	5	72	0.1	27	558	0.1	27	237	0.1	27
Louisiana	5	54	0.1	28	313	0.1	29	232	0.1	28
Kentucky	4	13	(1)	33	177	(1)	33	113	0.1	33
All other states[2]	28	2,527	4.5	....	14,199	3.3	....	5,752	2.6	...

[1] Less than one-tenth of 1 per cent.
[2] In order of value of products—North Carolina, Tennessee, Kansas, Connecticut, Alabama, Montana, Maine, Arkansas, Oregon, Oklahoma, District of Columbia, Wyoming, and South Dakota.

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	66,947	59,240	7,707	88.5	11.5
	1914	37,881	35,349	2,532	93.3	6.7
	1909	27,817	26,239	1,578	94.3	5.7
Proprietors and officials	1919	3,027	2,946	81	97.3	2.7
	1914	1,280	1,256	24	98.1	1.9
	1909	1,095	1,081	14	98.7	1.3
Proprietors and firm members	1919	122	111	11	91.0	9.0
	1914	99	89	10	89.9	10.1
	1909	161	153	8	95.0	5.0
Salaried officers of corporations	1919	673	654	19	97.2	2.8
	1914	473	462	11	97.7	2.3
	1909	367	361	6	98.4	1.6
Superintendents and managers	1919	2,232	2,181	51	97.7	2.3
	1914	708	705	3	99.6	0.4
	1909	567	567	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	8,334	5,460	2,874	65.5	34.5
	1914	4,290	3,496	794	81.5	18.5
	1909	2,993	2,492	501	83.3	16.7
Wage earners (average number)	1919	55,586	50,834	4,752	91.5	8.5
	1914	32,311	30,597	1,714	94.7	5.3
	1909	23,729	22,666	1,063	95.5	4.5
16 years of age and over	1919	55,420	50,753	4,667	91.6	8.4
	1914	32,023	30,411	1,612	95.0	5.0
	1909	23,502	22,569	993	95.8	4.2
Under 16 years of age	1919	166	81	85	48.8	51.2
	1914	288	186	102	64.6	35.4
	1909	167	97	70	58.1	41.9

TABLE 5.—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. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	55,586	**60,754**	57,339	53,281	51,100	*51,050*	51,651	53,509	55,014	57,089	58,607	59,086	58,552	84.0
Males	50,834	**55,865**	52,502	48,790	*46,393*	46,472	47,140	48,906	50,310	52,250	53,677	54,047	53,656	83.0
Females	4,752	4,889	4,837	*4,491*	4,707	4,578	4,511	4,603	4,704	4,839	4,930	**5,039**	4,896	89.1
1914	32,311	32,634	32,172	32,681	32,442	31,959	*31,876*	31,914	32,280	**32,813**	32,451	32,294	32,216	97.1
1909	23,714	*22,609*	22,772	22,968	13,241	23,601	23,782	23,747	23,540	23,943	24,355	24,873	**25,073**	90.2
California	1,466	**1,886**	1,728	1,622	1,463	1,337	*1,273*	1,275	1,346	1,392	1,400	1,429	1,441	67.5
Colorado	98	*89*	92	*89*	*89*	*89*	93	100	100	100	125	107	103	71.2
Georgia	107	*90*	100	93	101	99	121	**126**	124	113	111	110	96	71.4
Illinois	3,004	3,039	2,812	2,647	*2,570*	2,572	2,694	2,831	3,280	3,391	**3,544**	3,452	3,216	72.5
Indiana	1,026	**1,244**	1,108	993	994	889	*827*	913	998	1,105	1,075	1,094	1,072	66.5
Iowa	72	39	36	37	*32*	38	**109**	105	102	98	100	105	63	29.4
Kentucky	13	**14**	**14**	**14**	12	12	13	12	*11*	**14**	12	14	**14**	78.6
Louisiana	54	58	**62**	**62**	51	52	54	55	55	56	*47*	49	*47*	75.8
Maryland	797	*651*	740	769	710	764	814	771	803	857	926	**975**	784	66.8
Massachusetts	2,483	2,526	2,415	*2,329*	2,346	2,367	2,371	2,431	2,463	2,530	2,623	2,666	**2,729**	85.3
Michigan	5,712	**7,494**	6,697	5,768	5,042	*4,980*	5,077	5,083	5,123	5,482	5,720	5,962	6,116	66.5
Minnesota	162	*98*	140	171	193	188	**195**	178	153	143	147	189	185	50.3
Missouri	1,253	1,234	1,241	*1,218*	1,243	1,263	**1,280**	1,256	1,264	1,264	1,257	1,266	1,250	95.2
Nebraska	300	**792**	411	87	58	54	51	*48*	152	428	532	511	476	6.1
New Jersey	12,472	12,911	12,846	11,734	*11,277*	11,765	11,946	12,469	12,706	12,818	12,988	13,077	**13,127**	85.4
New York	9,687	11,461	10,829	9,995	9,405	8,926	*8,920*	9,015	9,152	9,356	9,647	9,765	9,773	77.8
Ohio	3,670	3,901	3,462	3,315	*3,022*	3,062	3,247	3,569	3,762	4,155	**4,210**	4,138	4,197	71.8
Pennsylvania	7,134	6,891	6,603	*6,602*	6,921	6,929	6,998	7,186	7,212	7,470	7,585	7,578	7,633	85.5
Rhode Island	287	*256*	259	262	276	272	281	318	319	299	305	299	298	80.3
Texas	150	*123*	137	133	158	154	145	151	146	151	**169**	168	165	72.8
Utah	454	492	453	547	437	351	*342*	455	486	496	491	449	449	62.5
Virginia	1,847	1,765	1,769	*1,544*	1,550	1,745	1,739	1,827	2,004	2,032	2,075	**2,118**	1,996	72.9
Washington	90	87	89	89	*76*	*76*	*76*	83	99	95	101	103	**108**	70.4
West Virginia	534	562	517	480	472	*452*	478	527	567	624	**625**	615	479	71.2
Wisconsin	187	**219**	198	188	174	180	171	*169*	178	183	197	201	186	77.2

TABLE 6.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED 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	55,586	258	2,288	18,804	8,123	2,997	15,365	5,562	2,189
	1914	32,311	(2)	(2)	947	303	1,586	12,912	5,553	11,010
	1909	23,729	(2)	(2)	86	703	389	9,213	6,581	6,757
California	1919	1,466	4	21	707	17	10	552	33	122
Georgia	1919	107	.....	.....	2	15	.....	42	48	.....
Illinois	1919	3,004	1	.....	1,942	65	497	58	375	66
	1914	1,682	(2)	(2)	23	10	62	15	351	1,221
Indiana	1919	1,026	1	.....	41	49	.....	.....	23	912
	1914	693	(2)	(2)	27	39	.....	.....	29	598
Maryland	1919	797	.....	.....	142	16	186	435	18	.....
Massachusetts	1919	2,483	1	4	838	1,430	74	117	19	.....
	1914	1,395	(2)	(2)	17	10	535	811	11	11
Michigan	1919	5,712	.....	3	1,737	719	117	2,600	479	48
	1914	4,509	(2)	(2)	29	18	20	2,040	1,741	661
Minnesota	1919	162	.....	.....	32	18	6	14	92	.....
Missouri	1919	1,253	.....	2	208	829	9	125	80	.....
	1914	842	(2)	(2)	106	75	386	44	172	59
Nebraska	1919	300	.....	.....	4	.....	.....	10	16	270
New Jersey	1919	12,472	25	2,037	4,853	860	260	2,242	2,116	79
	1914	6,278	(2)	(2)	25	91	65	3,457	1,115	1,523
New York	1919	9,687	18	177	3,061	2,300	1,073	2,901	123	34
	1914	7,780	(2)	(2)	200	39	346	3,641	325	3,229
Ohio	1919	3,670	116	46	77	371	20	2,739	283	18
	1914	2,017	(2)	(2)	380	.....	.....	859	266	512
Pennsylvania	1919	7,134	63	.....	3,703	1,096	254	373	1,380	265
	1914	4,748	(2)	(2)	48	14	.....	1,359	873	2,454
Rhode Island	1919	287	.....	.....	.....	.....	257	28	.....	2
Texas	1919	150	.....	.....	5	16	85	.....	44	.....
Utah	1919	454	7	.....	80	.....	84	111	.....	172
Virginia	1919	1,847	.....	.....	808	51	15	953	20	.....
	1914	644	.....	.....	.....	.....	.....	27	7	610
West Virginia	1919	534	.....	.....	1	141	.....	2	250	140
	1914	52	.....	.....	.....	.....	.....	49	3	.....
Wisconsin	1919	187	3	.....	6	32	5	80	55	6

[1] Includes 48 and under for 1914 and 1909.

[2] Corresponding figures not available.

TABLE 7.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED STATES: 1919.

STATE.	TOTAL. Establishments.	TOTAL. Wage earners (average number).	ESTABLISHMENTS EMPLOYING— No wage earners. Establishments.	1 to 5 wage earners, inclusive. Establishments.	1 to 5 wage earners, inclusive. Wage earners.	6 to 20 wage earners, inclusive. Establishments.	6 to 20 wage earners, inclusive. Wage earners.	21 to 50 wage earners, inclusive. Establishments.	21 to 50 wage earners, inclusive. Wage earners.	51 to 100 wage earners, inclusive. Establishments.	51 to 100 wage earners, inclusive. Wage earners.	101 to 250 wage earners, inclusive. Establishments.	101 to 250 wage earners, inclusive. Wage earners.	251 to 500 wage earners, inclusive. Establishments.	251 to 500 wage earners, inclusive. Wage earners.	501 to 1,000 wage earners, inclusive. Establishments.	501 to 1,000 wage earners, inclusive. Wage earners.	Over 1,000 wage earners. Establishments.	Over 1,000 wage earners. Wage earners.
United States:																			
1919	598	55,586	18	153	399	163	2,030	121	3,851	50	3,703	47	7,209	18	6,300	17	11,619	11	20,475
1914	395	32,311	11	120	302	109	1,257	52	1,742	44	3,064	28	4,407	14	4,695	9	6,197	8	10,647
California	49	1,466	2	15	32	14	194	12	401	3	247	2	273	1	319	.....	.....	.....	.....
Georgia	7	107	.....	3	8	2	21	2	78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	33	3,004	.....	8	19	8	97	7	196	6	386	2	234	1	477	.....	.....	1	1,595
Indiana	9	1,026	.....	2	6	4	67	1	41	1	83	.....	.....	.....	.....	1	829	.....	.....
Maryland	8	797	.....	1	3	2	34	2	51	.....	.....	2	325	1	384	.....	.....	.....	.....
Massachusetts	27	2,483	3	7	20	6	62	5	165	1	72	1	113	3	1,263	1	788	.....	.....
Michigan	36	5,712	5	14	25	4	64	7	223	1	90	.....	.....	1	340	1	692	3	4,278
Minnesota	9	162	.....	3	11	5	75	.....	.....	1	76	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	22	1,253	.....	4	10	7	81	6	166	3	204	1	109	.....	.....	1	683	.....	.....
Nebraska	12	300	.....	4	10	3	37	3	96	2	157	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	78	12,472	.....	13	35	16	213	18	565	9	698	15	2,466	3	888	1	618	3	6,989
New York	88	9,687	1	21	54	21	274	16	521	9	663	10	1,567	4	1,359	5	3,311	1	1,038
Ohio	37	3,670	.....	5	19	12	138	10	277	5	345	1	214	1	275	2	1,317	1	1,085
Pennsylvania	56	7,134	1	8	28	17	198	14	456	4	267	8	1,162	1	377	2	1,229	1	3,417
Rhode Island	4	287	.....	1	2	2	28	.....	.....	.....	.....	.....	.....	1	257	.....	.....	.....	.....
Texas	9	150	.....	2	5	5	66	2	79	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	8	454	.....	3	12	1	7	.....	.....	2	156	2	279	.....	.....	.....	.....	.....	.....
Virginia	12	1,847	.....	2	4	5	69	2	81	.....	.....	1	121	.....	.....	2	1,572	.....	.....
West Virginia	7	534	.....	2	3	.....	.....	2	85	1	100	2	346	.....	.....	.....	.....	.....	.....
Wisconsin	30	187	3	17	36	7	63	3	88	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 8.—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	598	395	359	55,586	32,311	23,729	$438,658,869	$158,053,602	$117,741,103	$222,357,590	$68,602,908	$53,595,674
Less than $5,000	41	53	56	30	69	64	98,181	137,979	124,959	39,026	84,675	57,896
$5,000 to $20,000	58	51	55	159	171	237	616,212	612,861	596,910	260,719	299,293	268,837
$20,000 to $100,000	132	103	97	1,044	1,066	1,310	6,881,164	5,719,359	4,985,195	3,582,111	3,162,556	2,746,341
$100,000 to $500,000	226	110	120	6,559	7,900	6,882	56,121,842	25,668,656	41,227,479	28,589,161	19,017,266	16,870,064
$500,000 to $1,000,000	58	34		4,821			39,373,056	23,837,291		18,061,554		
$1,000,000 and over	83	44	31	42,973	23,105	15,236	335,568,414	102,077,456	70,806,560	171,825,019	46,039,118	33,652,536
	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	6.9	13.4	15.6	0.1	0.2	0.3	(1)	0.1	0.1	(1)	0.1	0.1
$5,000 to $20,000	9.7	12.9	15.3	0.3	0.5	1.0	0.1	0.4	0.5	0.1	0.4	0.5
$20,000 to $100,000	22.1	26.1	27.0	1.9	3.3	5.5	1.6	3.6	4.2	1.6	4.6	5.1
$100,000 to $500,000	37.8	27.9	33.4	11.8	24.4	29.0	12.8	16.2	35.0	12.9	27.7	31.5
$500,000 to $1,000,000	9.6	8.6		8.7			9.0	15.1		8.1		
$1,000,000 and over	13.9	11.1	8.6	77.3	71.5	64.2	76.5	64.6	60.1	77.3	67.1	62.8

[1] Less than one-tenth of 1 per cent.

TABLE 9.—CHARACTER OF OWNERSHIP, BY STATES: 1919 AND 1914.

STATE.	Census 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.	
		Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States	1919	48	514	36	55,586	201	55,071	314	0.4	99.1	0.6	$438,658,869	$1,959,441	$433,055,446	$3,643,982	0.4	98.7	0.8
	1914	44	325	26	32,311	147	31,974	190	0.5	99.0	0.6	158,053,602	892,905	155,272,720	1,887,977	0.6	98.2	1.2
	1909	63	270	26	23,729	240	23,283	206	1.0	98.1	0.9	117,741,103	1,197,630	115,321,196	1,222,277	1.0	97.9	1.0
California	1919	4	40	5	1,466	5	1,418	43	0.3	96.7	2.9	10,539,416	38,141	10,184,906	317,369	0.4	96.6	3.0
Colorado	1919	.....	6	1	98	.....	[1] 98	.....	.....	100.0	.....	1,301,141	.....	[1] 1,301,141	.....	.....	100.0	.....
Georgia	1919	.....	7	.....	107	.....	107	.....	.....	100.0	.....	957,293	.....	957,293	.....	.....	100.0	.....
Illinois	1919	2	28	3	3,004	.....	2,976	[2] 28	.....	99.1	0.9	22,060,803	.....	21,599,109	[2] 461,694	.....	97.9	2.1
	1914	3	23	.....	1,682	5	1,677	.....	0.3	99.7	.....	8,618,118	18,775	8,599,343	.....	0.2	99.8	.....
Indiana	1919	.....	9	.....	1,026	.....	1,026	.....	.....	100.0	.....	8,649,304	.....	8,649,304	.....	.....	100.0	.....
Iowa	1919	.....	5	.....	72	.....	72	.....	.....	100.0	.....	558,084	.....	558,084	.....	.....	100.0	.....
Kentucky	1919	1	3	.....	13	.....	[2] 13	.....	.....	100.0	.....	177,018	.....	[2] 177,018	.....	.....	100.0	.....
Louisiana	1919	.....	4	1	54	.....	[1] 54	.....	.....	100.0	.....	312,806	.....	[1] 312,806	.....	.....	100.0	.....
Maryland	1919	.....	08	.....	797	.....	797	.....	.....	100.0	.....	5,277,426	.....	5,277,426	.....	.....	100.0	.....
Massachusetts	1919	3	20	4	2,483	42	2,404	37	1.7	96.8	1.5	17,305,166	169,139	16,866,495	269,532	1.0	97.5	1.6
	1914	2	17	5	1,895	.....	1,374	[2] 21	.....	98.5	1.5	6,684,918	.....	6,524,735	[2] 160,183	.....	97.6	2.4
Michigan	1919	9	25	2	5,712	[1] 4	5,708	.....	.....	99.9	.....	37,850,834	[1] 25,170	37,825,664	.....	.....	99.9	.....
	1914	11	21	4	4,509	12	4,493	4	0.3	99.6	0.1	13,891,415	26,300	13,858,241	6,874	0.2	99.8	(3)
Minnesota	1919	.....	9	.....	162	.....	162	.....	.....	100.0	.....	1,455,658	.....	1,455,658	.....	.....	100.0	.....
Missouri	1919	2	18	2	1,253	.....	1,211	[2] 42	.....	96.6	3.4	13,537,929	.....	12,943,083	[2] 594,846	.....	95.6	4.4
	1914	3	16	3	842	3	811	28	0.4	96.3	3.3	6,936,122	17,440	6,688,778	231,904	0.3	96.4	3.3
Nebraska	1919	.....	11	1	300	.....	[1] 300	.....	.....	100.0	.....	2,304,793	.....	[1] 2,304,793	.....	.....	100.0	.....
New Jersey	1919	4	72	2	12,472	[1] 43	12,429	.....	0.3	99.7	.....	84,033,941	[1] 394,321	83,639,620	.....	0.5	99.5	.....
	1914	4	58	2	6,276	[1] 21	6,255	.....	0.3	99.7	.....	31,686,865	[1] 125,248	31,561,617	.....	0.4	99.6	.....
New York	1919	8	76	4	9,687	52	9,613	22	0.5	99.2	0.2	88,101,532	890,247	86,921,539	289,746	0.1	98.7	0.3
	1914	10	57	3	7,780	82	7,613	85	1.1	97.9	1.1	42,876,880	583,446	41,435,938	857,496	1.4	96.6	2.0
Ohio	1919	1	36	.....	3,670	.....	[2] 3,670	.....	.....	100.0	.....	32,719,466	.....	[2] 32,719,466	.....	.....	100.0	.....
	1914	2	26	1	2,017	[1] 5	2,012	.....	0.2	99.8	.....	11,388,140	[1] 24,280	11,363,860	.....	0.2	99.8	.....
Pennsylvania	1919	2	53	1	7,134	.....	7,116	[2] 18	.....	99.7	0.3	73,332,932	.....	72,713,960	[2] 618,972	.....	99.2	0.8
	1914	2	34	3	4,748	.....	4,732	[2] 16	.....	99.7	0.3	22,387,835	.....	22,072,933	[2] 314,902	.....	98.6	1.4
Rhode Island	1919	.....	3	1	287	.....	[1] 287	.....	.....	100.0	.....	1,399,346	.....	[1] 1,399,346	.....	.....	100.0	.....
Texas	1919	.....	8	1	150	.....	[1] 150	.....	.....	100.0	.....	1,394,354	.....	[1] 1,394,354	.....	.....	100.0	.....
Utah	1919	.....	8	.....	454	.....	454	.....	.....	100.0	.....	1,708,957	.....	1,708,957	.....	.....	100.0	.....
Virginia	1919	1	11	.....	1,847	.....	[2] 1,847	.....	.....	100.0	.....	12,765,281	.....	[2] 12,765,281	.....	.....	100.0	.....
Washington	1919	.....	8	.....	90	.....	90	.....	.....	100.0	.....	1,363,434	.....	1,363,434	.....	.....	100.0	.....
Wisconsin	1919	7	17	6	187	7	131	49	3.7	70.1	26.2	2,074,299	43,249	1,670,850	360,200	2.1	80.6	1.7
All other states	1919	4	29	2	3,061	.....	3,037	[2] 24	.....	99.2	0.8	17,477,656	.....	17,023,500	[2] 454,156	.....	97.4	2.6

[1] Includes the group "All others." [2] Includes the group "Individuals." [3] Less than one-tenth of 1 per cent.

TABLE 10.—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	12,000	3,379	2,210	376,940	282,385	208,657	100.0	100.0	100.0
Owned	1,508	1,129	1,309	250,445	133,426	115,744	66.4	47.2	55.5
Steam [1]	1,355	1,061	1,231	241,749	124,329	103,488	64.1	44.0	49.6
Engines	1,136	1,061	1,231	127,164	124,329	103,488	33.7	44.0	49.6
Turbines	219			114,585			30.4		
Internal-combustion engines	122	47	39	5,004	5,962	1,190	1.3	2.1	0.6
Water wheels, turbines, and motors	31	21	39	3,692	3,135	11,066	1.0	1.1	5.3
Rented	10,492	2,250	901	126,495	148,959	92,913	33.6	52.8	44.5
Electric	10,492	2,250	901	126,419	134,481	92,067	33.5	47.6	44.1
Other	.....	.....	.....	76	14,478	846	(2)	5.1	0.4
Electric	17,452	4,871	2,182	235,973	172,510	156,709	100.0	100.0	100.0
Rented	10,492	2,250	901	126,419	134,481	92,067	53.6	78.0	58.8
Generated by establishments reporting	6,960	2,621	1,281	109,554	38,029	64,642	46.4	22.0	41.2

[1] Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.

[2] Less than one-tenth of 1 per cent.

TABLE 11.—FUEL CONSUMED, BY STATES: 1919 AND 1914.

STATE.	Census 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	389,356	3,844,667	457,259	789,347	18,427	1,836,998
	1914	491,603	2,667,248	275,440	500,668	(2)	2,744,939
California [3]	1919	17	56	1,716	496,136	60	24,352
Colorado [3]	1919	.....	4,877	.....	12	.....	60
Georgia [3]	1919	10	2,569	1,640	.....	.....	.....
Illinois	1919	132	407,312	20,353	11,110	610	15,359
	1914	.....	254,457	7,072	322	(2)	70
Indiana [3]	1919	266	138,218	3,311	5,003	.....	.....
Iowa [3]	1919	.....	1,287	2,500	105	25	.....
Kentucky [3]	1919	.....	613	607	.....	.....	.....
Louisiana	1919	.....	1	1,500	.....	.....	4,014
Maryland [3]	1919	.....	66,705	42	15,003	.....	7,200
Massachusetts	1919	16,157	44,699	133	6,775	.....	751
	1914	3,292	46,570	9,782	50	(2)	860
Michigan	1919	190	967,341	161,828	14,228	205	.....
	1914	16,321	854,567	80,534	36	(2)	464,646
Minnesota	1919	5,801	5,141	1,040	6,198	106	740
Missouri	1919	50	37,564	3,446	3,764	.....	4,480
	1914	30	41,964	1,879	1,555	(2)	2,949
Nebraska [3]	1919	.....	48,988	.....	73,702	1,325	.....
New Jersey	1919	283,265	221,877	8,189	61,805	5,699	16,987
	1914	287,166	125,990	9,799	10,892	(2)	8,900
New York	1919	64,883	483,708	95,430	5,210	358	23,966
	1914	125,066	363,440	75,062	7,344	(2)	31,440
Ohio	1919	596	714,592	93,108	226	8,424	75,086
	1914	.....	381,767	56,168	502	(2)	1,525,141
Pennsylvania	1919	17,872	441,199	7,893	48,507	734	99,050
	1914	51,836	338,040	5,247	12,731	(2)	335,137
Rhode Island	1919	.....	6,016	77	2,652	.....	.....
Texas [3]	1919	5	22	2,507	14,854	35	643
Utah [3]	1919	.....	30,101	.....	12,086	822	.....
Virginia [3]	1919	60	146,051	21,510	130	.....	.....
Washington [3]	1919	.....	715	.....	4,579	10	.....
West Virginia	1919	.....	13,157	3,670	30	.....	1,426,416
Wisconsin [3]	1919	.....	5,941	10	.....	11	.....
All other states	1919	52	55,917	23,740	7,232	3	137,904
	1914	7,892	260,453	20,897	467,236	(2)	375,796

[1] Includes some semianthracite.

[2] Included with figures for fuel oils

[3] Included in "All other states" in 1914.

SPECIAL STATISTICS.

MATERIALS.

Table 12 presents comparative statistics for materials used in the chemical industry, inclusive of "Coal-tar products" and "Sulphuric, nitric, and mixed acids," for 1919, 1914, 1909, and 1904. Establishments assigned to other industries but manufacturing chemicals as subsidiary products, did not, as a rule, report the consumption of the materials called for by the chemical schedule, and hence the figures do not represent total consumption of the specified materials.

Principal materials, by industries.—The consumption of certain of the leading materials asked for specifically in the various special schedules are given in Table 13 by industries.

TABLE 12.—MATERIALS: 1919, 1914, 1909, AND 1904.

[Tons, 2,000 pounds.]

	1919				1914	1909	1904	PER CENT OF INCREASE.[1]		
	Total.	Chemicals.	Coal-tar products.	Sulphuric, nitric, and mixed acids.				1914-1919	1909-1914	1904-1909
Total cost	$296,155,374	$216,301,279	$63,996,734	$15,857,361	$96,185,122	$69,531,257	$47,070,595	207.9	38.3	47.7
Sulphur:										
Tons	263,256	153,018	10,308	99,930	56,296	77,450	51,526	308.0	−27.5	50.7
Cost	$6,062,915	$3,599,968	$218,162	$2,244,785	$1,162,632	$1,433,743	$1,071,229	422.0	−18.9	33.8
Pyrite:										
Tons	695,974	192,851	.....	503,123	889,695	597,691	334,207	−21.8	48.9	78.8
Cost	$4,381,185	$1,321,242	.....	$3,059,943	$3,769,467	$3,170,188	$1,745,416	16.2	18.9	81.5
Nitrate of soda:										
Tons	78,810	35,633	7,632	35,545	58,101	52,976	45,021	35.6	9.7	17.7
Cost	$5,331,440	$2,188,039	$656,233	$2,487,168	$2,696,172	$2,373,220	$1,895,248	97.7	13.6	25.2
Sulphuric acid:										
Tons	452,445	219,676	57,512	175,257	164,774	58,552	104,489	174.6	352.0	−44.0
Cost	$4,933,900	$2,573,730	$1,520,055	$840,115	$1,515,982	$564,390	$945,486	225.5	169.0	−40.3
Nitric acid:										
Tons	27,340	22,301	1,039	4,000	7,819	1,525	3,068	249.7	413.0	−50.3
Cost	$689,713	$295,311	$194,402	$200,000	$641,405	$139,591	$320,818	7.5	359.0	−56.5
Mixed acid:										
Tons	28,971	4,078	24,893	.....	6,015	4,546	1,734	382.0	32.3	162.2
Cost	$2,921,882	$446,332	$2,475,550	.....	$698,664	$335,672	$156,605	318.0	108.0	114.3
Ammonium sulphate:										
Tons	4,366	4,102	240	24	9,586	1,675	5,676	−54.5	472.0	−70.5
Cost	$368,222	$339,431	$26,582	$2,209	$567,249	$88,013	$356,109	−35.1	544.5	−75.3
Alcohol:										
Grain (ethyl)—										
Gallons	1,817,784	1,392,157	425,619	8	296,886	479,428	187,389	512.0	−38.1	156.0
Cost	$950,438	$714,635	$235,779	$24	$145,066	$287,416	$449,604	555.0	−49.5	−36.1
Wood (methyl)—										
Gallons	2,888,786	2,302,617	585,068	1,101	1,464,273	949,212	601,077	97.3	54.3	57.9
Cost	$3,631,183	$2,793,080	$835,620	$2,483	$577,122	$370,017	$367,223	529.0	56.0	0.8
Fuel and rent of power, cost	$39,005,662	$32,742,310	$4,141,033	$2,122,319	$11,854,901	$8,566,924	$4,913,267	229.0	38.4	74.4
All other material, cost	$227,878,834	$169,287,201	$53,693,318	$4,898,315	$72,556,462	$52,202,083	$34,849,790	214.1	39.0	49.8

[1] A minus sign (−) denotes decrease.

TABLE 13.—SPECIFIED MATERIALS, BY INDUSTRIES: 1919 AND 1914.

INDUSTRY.	1919		1914	
	Quantity.	Cost.	Quantity.	Cost.
SULPHUR.				
Total, tons	570,769	$13,671,065	82,248	$1,730,647
Chemicals	153,018	3,599,968	52,679	1,085,877
Coal-tar chemicals	10,308	218,162		
Sulphuric, nitric, and mixed acids	99,930	2,244,785	3,617	76,755
Explosives	25,797	659,219	15,832	372,763
Fertilizers	221,558	5,669,331	2,041	42,716
Petroleum, refining	5,241	136,828	2,035	42,423
Other industries	54,917	1,142,772	6,044	110,113
PYRITE.				
Total, tons	1,146,958	8,757,902	1,581,607	7,822,030
Chemicals	192,851	1,321,242	357,385	1,522,165
Sulphuric, nitric, and mixed acids	503,123	3,059,943	532,310	2,247,302
Explosives	6,812	46,147	25,885	139,496
Fertilizers	398,602	3,919,050	613,842	3,590,235
Petroleum, refining	26,275	224,700	23,669	163,630
Other industries	19,295	186,820	28,516	159,202
NITRATE OF SODA.				
Total, tons	418,371	$31,133,537	412,748	$10,264,181
Chemicals	35,633	2,188,039	25,715	1,176,733
Coal-tar products	7,632	656,233		
Sulphuric, nitric, and mixed acids	35,545	2,487,168	32,386	1,519,439
Explosives	174,742	13,154,333	190,960	8,979,877
Fertilizers:				
For acid manufacture	21,732	1,692,614	15,134	704,581
For mixed fertilizers	130,683	10,091,790	147,050	6,807,228
Other industries	12,404	863,360	1,503	76,323
SULPHURIC ACID.				
Total, tons	1,850,828	25,277,462	1,359,519	10,278,643
Chemicals	219,676	2,573,730	146,415	1,287,129
Coal-tar chemicals	57,512	1,520,055		
Sulphuric, nitric, and mixed acids	175,257	840,115	118,359	228,853
Explosives	62,069	976,295	52,398	723,795
Fertilizers	756,818	8,223,533	728,889	4,387,317
Petroleum, refining	503,923	10,327,210	290,455	3,519,552
Other industries	75,573	816,464	23,003	131,997

TABLE 13.—SPECIFIED MATERIALS, BY INDUSTRIES, 1919 AND 1914—Continued.

INDUSTRY.	1919		1914	
	Quantity.	Cost.	Quantity.	Cost.
NITRIC ACID.				
Total, tons	32,940	$1,490,546	12,612	$1,148,850
Chemicals	21,957	295,311	5,363	448,808
Coal-tar chemicals	1,039	194,402		
Sulphuric, nitric, and mixed acids	4,000	200,000	2,456	192,597
Explosives	1,537	200,267	4,347	476,404
Other industries	4,407	600,566	446	31,041
MIXED ACID.				
Total, tons	47,387	4,706,895	25,273	1,746,141
Chemicals	4,078	446,332	6,018	698,764
Coal-tar chemicals	24,893	2,475,550		
Explosives	16,637	1,567,691	19,255	1,047,377
Other industries	1,779	217,322	.....	.....
AMMONIUM SULPHATE.				
Total, tons	140,368	13,121,408	159,534	9,584,062
Chemicals	4,102	339,431	9,610	568,899
Coal-tar chemicals	240	26,582		
Other industries	136,026	12,755,395	149,924	9,015,163
ALCOHOL, GRAIN (ETHYL).				
Total, gallons	8,483,351	$17,553,806	1,440,443	$647,321
Chemicals	1,392,157	714,635	379,119	210,812
Coal-tar chemicals	425,619	235,779		
Sulphuric, nitric, and mixed acids	8	24		
Explosives	39,884	167,447		
Paint and varnish	2,985,735	1,724,112	1,061,324	436,509
Druggists' preparations, etc.	2,962,842	14,379,871		
Other industries	677,106	331,938		
ALCOHOL, WOOD (METHYL).				
Total, gallons	10,653,665	10,095,283	2,454,224	1,000,119
Chemicals	2,302,617	2,793,080	1,466,773	577,997
Coal-tar chemicals	585,068	835,620		
Sulphuric, nitric, and mixed acids	1,101	2,483		
Paint and varnish	244,561	303,998		
Druggists' preparations	73,208	106,147	987,451	422,122
Wood distillation	7,360,390	5,898,175		
Other industries	86,720	155,780		

PRODUCTS.

No important changes have been made in the classification of chemicals since the census of 1914, but additional delimitation of the groups has been found advisable, and some rearrangement of items. So far as practicable 1914 figures have been grouped to correspond with the statistics for 1919 so that comparisons may be fairly made.

The products are classified under 10 groups, and Table 14 presents the figures for group totals for 1919, 1914, and 1909.

TABLE 14.—PRODUCTS, GROUP TOTALS: 1919, 1914, AND 1909.

	1919	1914	1909
Total value	$685,268,285	$200,195,835	$150,580,140
The chemical industry	438,658,869	158,053,602	117,741,103
Coal-tar products	135,482,161		
Sulphuric, nitric, and mixed acids	31,470,480	15,215,474	9,884,057
Chemicals, subsidiary products of other industries	79,656,775	26,926,759	22,954,980
GROUP.			
I.—Acids	86,194,195	32,837,254	26,068,617
II.—Ammonium and cyanogen compounds	23,067,553	8,064,913	(1)
III.—Sodas, sodium and compounds	99,689,828	32,626,335	25,048,019
IV.—Potash, potassium and compounds	18,407,253	7,905,744	(1)
V.—Alum, aluminum and compounds [2]	43,433,482	(1)	(1)
VI.—Bleaching compounds	12,392,806	5,302,359	3,215,726
VII.—Coal-tar chemicals	133,499,742	13,492,453	7,969,672
VIII.—Plastics	77,477,041	13,895,784	7,472,732
IX.—Compressed and liquefied gases	43,263,918	10,415,325	(1)
X.—Chemicals, not elsewhere specified	156,672,155	52,898,172	48,851,270
Group total, gross	694,097,973	(1)	(1)
Intergroup duplications	50,105,073	(1)	(1)
Total chemicals, net	643,992,900	191,895,464	142,486,463
By-products and residues of chemical operations	25,923,661	4,409,620	5,884,608
By-products, not chemical	14,870,876	3,702,017	2,209,078
Amount received for contract work	480,848	188,734	

[1] Comparable figures not available.
[2] Alums—1919, $17,055,891; 1914, $3,467,969; 1909, $3,022,355.

Group I is devoted exclusively to acids. Three groups, II, III, and IV, are built upon the most important alkalies—ammonium, sodium, and potassium—and include elements, oxides, hydroxides, and salts; while Group X gathers in all of the less important metals and basic elements, derivatives of both, and organic compounds. Salts in Groups II, III, IV, and X in a measure duplicate the acids of Group I.

Five groups depend upon other than chemical separations. Group V, alums, aluminum, and compounds, concerns chiefly a class of mordanting compounds, and Group VI, bleaching agents. Group VII is differentiated by the basic material. Group VIII, plastics, expresses by the title the character of the chemical products. Group IX is dependent upon physical state and method of marketing. The members of these five groups belong within one or more of the other subdivisions. It is designed to make each group, so far as possible, comprehensive of the products within its scope.

This duplication exists only to a small degree in the statistics for the prior censuses, and the amount of duplication in the statistics for 1919 is noted.

Owing to the fact that the term "Fine chemicals" is applied not only to compounds that are rare and of high unit value, but also to specially refined grades of other chemicals, a separation on this basis has not been attempted. It would imply another basis of separation, namely, that of purity or value, and with fine chemicals any conclusions drawn from the figures would be open to question on account of the large percentage of these products concealed in lump sums of unenumerated items.

The aggregate figures necessarily include the by-products and residues of chemical operations and the income from other sources of the establishments reporting. The total value of products, $685,268,285, includes chemicals to the amount of $643,992,900. The groups as presented involve a gross total of $694,097,973, of which amount $50,105,073 is intergroup duplications. For example, carbonic acid (carbon dioxide) value $6,574,250, is included in Group I, Acids, and also in Group IX, Compressed and liquefied gases.

The following tabular statement shows the percentages of increase of the several items given in Table 14 for the census periods 1914–1919 and 1909–1914.

	PER CENT OF INCREASE (TABLE 14).	
	1914–1919	1909–1914
Total	242	33
The chemical industry	263	34
Coal-tar products		
Sulphuric, nitric, and mixed acids	107	54
Chemicals, subsidiary products of other industries	196	17
I.—Acids	162	26
II.—Ammonium and cyanogen compounds	186	.....
III.—Sodas, sodium and compounds	206	30
IV.—Potash, potassium and compounds	133	.....
V.—Alums, aluminum, and compounds	.....	.....
VI.—Bleaching compounds	134	65
VII.—Coal-tar chemicals	889	69
VIII.—Plastics	458	86
IX.—Compressed and liquefied gases	315	.....
X.—Chemicals, not elsewhere specified	196	8
Total chemicals, net	236	35

GROUP I.—ACIDS.

Chemical substances can be subdivided into four main classes: (1) Acids, including acid oxides or anhydrides; (2) Bases, including basic elements, oxides and hydroxides; (3) Salts or combinations of acids with bases; and (4) Other compounds of neutral character. For purposes of census classification, free acids and their anhydrides are included in Group I, while bases are subdivided into a number of groups each of which includes a basic metal or element and its oxides, hydroxides, and salts, with acids. Thus acids appear as component parts of other groups, and the acids appearing in Group I are largely duplicated in the salts of other groups.

Table 15 presents the detailed statistics for acids for 1919, 1914, and 1909. The table shows the number of establishments reporting specific products, and, where available, the quantity made and consumed in the same establishment has been given in addition to that produced for sale. Average unit values have been carried into the table as an index of the advance in values where the production data for prior years were comparable. With respect to the major acids, the distribution of the establishments by geographic divisions is given in Table 16.

TABLE 15.—GROUP I.—ACIDS.

	1919	1914	1909
Value of products	$86,194,195	$32,837,254	$26,068,617
INORGANIC ACIDS, value	$59,875,958	$25,082,873	.....
Arsenic and arsenious acids:			
Number of establishments	6	.....	.....
Total production, pounds	2,622,389	.....	.....
For sale—			
Pounds	1,076,000	(1)	(1)
Value	$108,233	.....	.....
Made and consumed, pounds	1,546,389	.....	.....
Boric (boracic) acid:			
Number of establishments	6	5	5
Pounds	13,454,100	8,584,311	5,554,914
Value	$1,754,632	$588,981	$295,776
Unit value, pound	$0.12	$0.07	$0.06
Carbonic acid (carbon dioxide CO_2):			
Number of establishments	42	38	35
Pounds	59,771,411	50,445,779	47,953,291
Value	$6,574,250	$2,320,685	$2,345,743
Unit value, pound	$0.11	$0.04	$0.05
Hydrochloric (muriatic) acid:			
Number of establishments	40	31	38
Total production, tons	221,749	168,584	122,367
For sale—			
Tons	150,090	85,438	101,607
Value	$4,312,253	$1,348,805	$1,758,335
Unit value, ton	$29	$16	$17
Made and consumed, tons	71,659	83,146	20,760
Hydrofluoric acid:			
Number of establishments	6	9	10
Total production, pounds	5,732,198	7,209,248	8,027,290
For sale—			
Pounds	4,320,017	5,373,657	6,842,914
Value	$440,184	$325,540	$294,379
Unit value, pound	$0.10	$0.06	$0.04
Made and consumed, pounds	1,412,181	1,835,591	1,184,376
Mixed acid (sulphuric-nitric):			
Number of establishments	42	37	14
Total production, tons	114,886	112,124	.....
For sale—			
Tons	46,428	42,725	28,591
Value	$4,426,637	$2,204,480	$1,860,787
Unit value, ton	$95	$51	$65
Made and consumed, tons	68,458	69,399	.....
Nitric acid:			
Number of establishments	59	52	25
Total production, tons	96,992	78,589	68,717
For sale—			
Tons	19,436	14,685	13,663
Value	$2,976,095	$1,591,625	$1,357,098
Unit value, ton	$153	$108	$99
Made and consumed, tons	67,556	63,904	55,054
Phosphoric acid:			
Number of establishments	9	7	9
Total production, pounds	22,109,302	.....	.....
For sale—			
Pounds	13,379,501	12,420,191	.....
Value	$1,711,148	$680,239	$667,505
Unit value, pound	$0.13	$0.05	.....
Made and consumed, pounds	8,729,801	.....	.....
Sulphuric acid:			
Number of establishments	216	194	183
Total production reduced to 50° Baumé, tons	5,552,581	4,071,566	2,764,455
For sale—			
Tons	3,331,362	2,338,284	1,479,200
Value	$35,932,605	$15,395,133	$10,103,425
Unit value, ton	$10.32	$6.58	$6.89
Made and consumed, tons	2,221,219	1,733,282	1,285,255
Production according to strength—			
For sale—			
50° Baumé—			
Tons	839,780	451,121	528,263
Value	$9,543,118	$2,709,350	$3,176,430
60° Baumé—			
Tons	949,371	545,652	177,414
Value	$9,498,800	$3,754,866	$1,038,358
66° Baumé—			
Tons	707,303	732,186	453,370
Value	$13,521,316	$8,042,422	$5,454,002
Oleum or fuming—			
Tons	133,655	62,354	28,594
Value	$3,369,371	$888,495	$434,635
Unit value, ton	$31	$14	$15
Made and consumed, tons—			
50° Baumé	1,910,332	1,250,112	1,115,018
60° Baumé	70,681	249,927	11,970
66° Baumé	126,892	96,280	99,249
Oleum or fuming	18,149	15,404	3,743
Sulphuric acid, reclaimed:			
Number of establishments	65	14	.....
Total production, tons	473,555	.....	.....
For sale—			
Tons	95,119	136,360	7,069
Value	$803,144	$518,890	$62,935
Made and consumed, tons	378,436	.....	.....

(See footnotes at end of table.)

TABLE 15.—GROUP I.—ACIDS—Continued.

	1919	1914	1909
ORGANIC ACIDS, value	$26,318,237	$7,754,381	.....
Acetic acid, value	$4,264,044	$1,272,294	.....
Acetic, dilute and pyroligneous—			
Number of establishments	13		
Total production, pounds	42,248,803		
For sale—			
Pounds	33,057,776		
Value	$1,359,521		
Unit value, pound	$0.04		
Made and consumed, pounds	9,191,027		
Acetic, glacial—			
Number of establishments	6	13	13
Total production, pounds	20,131,487	75,303,375	58,000,602
For sale—			
Pounds	19,244,960	70,617,637	56,923,773
Value	$2,325,027	$1,272,294	$1,336,874
Unit value, pound	$0.12	4,685,738	1,076,829
Made and consumed, pounds	886,527		
Acetic anhydride—			
Number of establishments	7		
Total production, pounds	1,794,085		
For sale—			
Pounds	1,213,961		
Value	$578,596		
Unit value, pound	$0.47		
Made and consumed, pounds	581,124		
Citric acid:			
Number of establishments	6	3	5
Total production, pounds	3,260,482	2,729,943	.....
For sale—			
Pounds	3,163,676	2,657,840	2,102,259
Value	$3,047,371	$1,516,336	$777,235
Unit value, pound	$0.96	$0.57	$0.37
Made and consumed, pounds	96,806	72,103	.....
Lactic acid:			
Number of establishments	4	.....	.....
Value	$781,828	(1)	(1)
Oleic acid:			
Number of establishments	15	7	8
Total production, pounds	44,895,453	23,187,579	.....
For sale—			
Pounds	44,350,574	21,932,736	16,377,063
Value	$6,548,564	$1,301,353	$845,106
Unit value, pound	$0.15	$0.06	$0.05
Made and consumed, pounds	544,879	1,254,843	.....
Stearic acid:			
Number of establishments	9	10	11
Total production, pounds	17,048,421	14,960,109	.....
For sale—			
Pounds	16,969,878	14,351,404	.....
Value	$3,796,439	$1,242,492	$1,143,213
Unit value, pound	$0.22	$0.09	.....
Made and consumed, pounds	78,543	608,705	.....
Tannic acid:			
Number of establishments	4	5	.....
Pounds	845,095	853,830	(1)
Value	$746,825	$287,142	.....
Unit value, pound	$0.88	$0.34	.....
Tartaric acid:			
Number of establishments	4	.....	.....
Pounds	5,312,965	(1)	(1)
Value	$4,262,376	.....	.....
Other acids:			
Inorganic [4]	$836,777	$108,495	$3,220,206
Organic [5]	$2,870,790	$2,134,764	

[1] Not reported separately.
[2] Includes a large production under a long-term, low-priced contract.
[3] Includes sulphur-trioxide, "Battery acid" and "Electrolyte sulphuric," 74,533 tons.
[4] Includes, 1919, chlorsulphonic, chromic, hydrobromic, hydrofluosilicic, hypophosphorous, molybdic, silicic, sulphurous, tungstic, vanadic, etc., and for 1914 sulphurous, hypophosphorous, arsenic, and hydrofluosilicic.
[5] Includes, 1919, butyric, caproic, carbolic, cresylic, formic, gallic, glycerophosphoric, hydrocyanic, monochloracetic, oxalic, phthalic anhydride, propionic, pyrogallic, thymic, valerianic, etc.

TABLE 16.—THE MAJOR ACIDS—DISTRIBUTION OF NUMBER OF ESTABLISHMENTS, BY GEOGRAPHIC DIVISIONS: 1919.

	United States.	New England.	Middle Atlantic.	North Central.	South Atlantic.	South Central.	Mountain.	Pacific.
Sulphuric	216	6	42	40	77	33	7	11
Sulphuric (reclaimed)	65	.....	21	19	2	14	4	5
Nitric	59	3	27	15	1	1	5	7
Mixed	42	1	17	14	1	1	5	3
Carbonic	42	4	10	15	3	6	.....	4
Hydrochloric	40	4	18	9	2	1	2	4
Acetic	21	2	9	7	2	.....	.....	1

Sulphuric acid.—Sulphuric acid may be considered the fundamental of the acid group, since nearly all other acids are made through its instrumentality, with the difference that sulphuric acid does not figure in the final product, but remains with the residual salt or by-product of the process.

To show how extensively sulphuric acid is employed in the production of other acids, a synopsis of methods of manufacture is given—

A.—Direct action of sulphuric acid (usually upon a natural salt or by-product of another process), liberating free acid.

ACID SET FREE.	NATURAL SALT OR BY-PRODUCT: SOURCE—
Acetic	Acetates, wood distillation industry.
Boric	Borax from lake brines.
Carbolic	Coal-tar fraction, after caustic extraction.
Carbonic	Limestone or marble.
Chlorsulfonic	Chlorine and sulphuric acid.
Citric	Citrates, citrus fruit industry.
Gallic	Tannic acid, extracts industry.[1]
Hydrobromic	Brines from mines and lakes.
Hydrochloric	
Hydrocyanic	Gas, coke, and beet sugar industries.
Hydroferrocyanic	
Hydrofluoric	Fluorspar or cryolite.
Hydrofluosilicic	Fluorspar and sand, or by-product phosphate manufacture, fertilizer industry.
Lactic	Lactates, dairy industry.
Mixed	Mixture, nitric and sulphuric.
Nitric	Chili saltpeter.
Oxalic	Sawdust, lumber industry.[1]
Phosphoric	Bone ash or phosphate rock.
Phthalic	Naphthalene, coal-tar industry, with catalyst.[2]
Tartaric	Tartrates, wine industry.
Valerianic	Fusel oil, distillation industry, with bichromate.[2]
Vanadic	Carnotite ores, by-product radium industry.

[1] Action of boiling dilute sulphuric acid—hydroxylation.
[2] Action of concentrated sulphuric acid—oxidation.

B.—Action of sulphuric acid, after a preliminary operation.

Chromic	Alkaline fusion chrome iron ore, then sulphuric acid.
Silicic	Alkaline fusion quartz, then sulphuric acid.
Tungstic	Alkaline fusion tungsten ore, then sulphuric acid.
Formic	Alkali heated under pressure with CO, CO_4, or CO_2.
Hypophosphorus	Barium hydroxide heated with phosphorus.
Lactic	Specific bacterial fermentation, starch paste or sugar from corn, potato, molasses, etc. ,neutralized lime, then sulphuric acid.
Butyric	Same general method as lactic, specific bacteria.
Caproic	Similar to lactic.
Caprionic	
Oleic	Alkaline saponification, fats and oils of slaughtering and meat packing, olive and cotton-seed oil industries, then sulphuric.
Stearic	Similar to oleic.
Oxalic	Formic acid process continued with more heat, neutralized lime and sulphuric acid added.

C.—Acids not employing sulphuric acid.

Arsenious	Roasting arsenical pyrites.
Molybdic	Roasting molybdenum sulphide ore.
Chloracetic	Chlorine passed into acetic acid.[1]
Glycerophosphoric	Glycerine and phosphoric acid heated together.[1]
Pyrogallic	Gallic acid heated in autoclave with water.
Tannic	Extract of gall nuts.

[1] Acetic and phosphoric acids and sometimes chlorine produced by use of sulphuric acid.

D.—Additional methods developed for important acids, largely synthetic.

Acetic	Bacterial oxidation of alcohol.
	Synthesis from acetylene, catalytic.
Carbonic	Combustion, organic material.
	Fermentation, organic material.
Citric	Fermentation of sugar.
Hydrobromic	Synthesis from hydrogen and bromine, catalytic.
Hydrochloric	Synthesis from hydrogen and chlorine.
	By-product, Le Blanc soda process. (Class *a*.)
	By-product, chlorination processes.
Nitric	Synthesis of nitrogen and oxygen, electrolytic.
	Synthesis from ammonia and oxygen, catalytic.
Phosphoric	Synthesis from white phosphorus and oxygen.
Stearic	Synthesis from oleic, catalytic hydrogenation.

Sulphuric acid production.—Table 17 presents the statistics for sulphuric acid production, 1919 and 1914, distributed by industries, by process used in manufacture, and by states; also whether produced for sale or for consumption in the producing establishment. It gives also the weight of platinum in use in the industry.

TABLE 17.—SULPHURIC ACID (BASIS 50° BAUMÉ): 1919 AND 1914.

	TON (2,000 POUNDS).		VALUE.	
	1919	1914	1919	1914
Total production	5,552,581	4,071,566		
For sale	3,331,362	2,338,284	$35,932,605	$15,395,123
Made and consumed	2,221,219	1,733,282		
By industries.				
Establishments engaged primarily in the manufacture of—				
Sulphuric, nitric, and mixed acids—				
For sale	1,685,341	1,359,183	18,112,942	9,044,538
Made and consumed	213,437	(1)		
Chemicals in general—				
For sale	524,135	500,488	6,460,983	3,773,318
Made and consumed	251,364	(1)		
Fertilizers—				
For sale	282,460	129,053	3,329,628	768,873
Made and consumed	1,529,624	(1)		
Explosives—				
For sale	42,041	133	537,077	1,713
Made and consumed	43,187	(1)		
Products of other industries—				
For sale	797,385	349,427	7,491,975	1,806,691
Made and consumed	183,607	(1)		
By process.				
Establishments using the: [2]				
Chamber process	3,757,887	2,961,815		
Contact process	1,141,418	698,413		
Both chamber and contact processes	653,276	411,338		
Production, by states.				
Alabama:				
For sale	61,218	38,317	795,058	293,525
Made and consumed	96,611			
California:				
For sale	367,773	114,058	4,732,759	945,276
Made and consumed	46,074			

[1] Figures not available.
[2] Chamber process only was reported by 24 establishments in 1919 and 13 in 1914; contact process only was reported by 185 establishments in 1919 and 172 in 1914; while both chamber and contact processes were reported by only 7 establishments in 1919 and 9 in 1914.

TABLE 17.—SULPHURIC ACID (BASIS 50° BAUMÉ); 1919 AND 1914—Continued.

	TON (2,000 POUNDS).		VALUE.	
	1919	1914	1919	1914
Georgia:				
For sale	19,906	20,151	$325,958	$115,220
Made and consumed	252,899			
Illinois:				
For sale	470,092	349,252	4,483,311	1,848,031
Made and consumed	72,691			
Louisiana:				
For sale	16,232	(1)	162,572	(1)
Made and consumed	65,896			
Maryland:				
For sale	159,957	187,937	1,747,830	1,194,801
Made and consumed	330,928			
New Jersey:				
For sale	393,067	399,667	5,013,063	3,085,226
Made and consumed	249,072			
New York:				
For sale	69,699	63,970	1,098,800	532,938
Made and consumed	52,262			
Ohio:				
For sale	255,271	142,800	2,713,108	983,583
Made and consumed	117,085			
Pennsylvania:				
For sale	468,696	362,270	5,559,984	2,498,117
Made and consumed	93,874			
All other:				
For sale	1,049,451	659,862	9,300,162	3,898,406
Made and consumed	843,827			
Weight of platinum used.	TROY OUNCES.			
Total weight	41,851	29,835		
In stills or concentration pans	3,366	8,829		
In contact mass	38,485	21,006		

[1] Figures not available.

Sulphuric acid production, according to strength.—Table 18 presents the statistics of production, 1919, according to strength, and whether produced for sale or for consumption in the producing establishment.

TABLE 18.—SULPHURIC ACID: 1919.

(Ton, 2,000 pounds.)

	Number of establishments.	PRODUCTION ACCORDING TO STRENGTH.										TOTAL ON BASIS OF 50° BAUMÉ.	
		50° Baumé.		60° Baumé.		66° Baumé.		Oleum.[1]		Trioxide.		Tons.	Value.
		Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.		
Total production	216	2,750,112		1,020,052		834,195		76,678		75,126		5,552,581	
Produced for sale		830,780	$9,543,118	949,371	$9,498,800	707,303	$13,521,316	63,816	$1,996,018	69,839	$1,373,353	3,331,362	$35,932,605
Made and consumed (in establishment producing)		1,910,332		70,681		126,892		12,862		5,287		2,221,219	
Alabama	13	85,811		20,394		31,017						157,829	
For sale				20,394	337,769	23,817	457,289					61,218	795,058
Made and consumed		85,811				7,200						96,611	
California	10	274,478		3,462		62,637		24,021				413,847	
For sale		228,414	2,542,872	3,462	31,943	62,637	1,036,564	24,021	1,121,380			367,773	4,732,759
Made and consumed		46,064										46,074	
Georgia	27	266,993		1,168		2,901						272,805	
For sale		14,094	220,619	1,168	11,463	2,901	93,876					19,906	325,958
Made and consumed		252,899										252,899	
Illinois	11	134,050		217,590		21,905		9,779		45,161		542,783	
For sale		92,698	948,297	202,132	2,032,654	20,534	464,901	3,958	108,859	45,161	928,600	470,092	4,483,311
Made and consumed		41,358		15,458		1,371		5,821				72,691	
Louisiana	5	57,713		18,105		1,189						82,128	
For sale		11,292	103,341	2,525	36,719	1,189	22,512					16,232	162,572
Made and consumed		46,421		15,580								65,896	
Maryland	7	424,287		34,000		16,065						490,885	
For sale		93,359	1,075,421	34,000	396,238	16,065	276,171					159,957	1,747,830
Made and consumed		330,928										330,928	
New Jersey	18	304,985		25,883		195195		7,023				642,139	
For sale		113,129	1,420,578	24,354	406,980	158,325	3,024,409	7,023	161,096			393,067	5,013,063
Made and consumed		191,856		1,529		36,870						249,072	

[1] Includes battery acid and electrolyte sulphuric, 4,694 tons.

TABLE 18.—SULPHURIC ACID: 1919—Continued.

	Number of establishments.	PRODUCTION ACCORDING TO STRENGTH.										TOTAL ON BASIS OF 50° BAUMÉ.	
		50° Baumé.		60° Baumé.		66° Baumé.		Oleum.		Trioxide.			
		Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.	Tons.	Value.
New York	5	41,826		17,346		23,303		13,742				121,961	
For sale		10,758	$149,644	9,201	$177,893	20,978	$573,555	9,341	$197,708			69,699	$1,098,800
Made and consumed		31,068		8,145		2,325		4,401				52,262	
Ohio	14	128,049		29,989		125,759				9,421		372,356	
For sale		39,310	380,226	25,790	307,887	110,361	1,853,834			9,421	$171,161	255,271	2,713,108
Made and consumed		88,739		4,199		15,398						117,085	
Pennsylvania	19	160,084		169,855		111,875		504		11,136		562,570	
For sale		95,820	1,127,533	158,057	2,273,361	108,026	2,035,308	498	11,095	5,849	112,687	468,696	5,559,984
Made and consumed		64,264		10,898		3,849		6		5,287		93,874	
All other states [1]	87	871,820		482,260		242,349		21,609		9,408		1,893,278	
For sale		140,906	1,574,587	467,388	3,485,893	182,470	3,682,897	18,975	395,880	9,408	160,905	1,049,451	9,300,162
Made and consumed		730,914		14,872		59,879		2,634				843,827	
Florida		47,231										47,231	
Massachusetts		95,041				10,451						110,718	
Mississippi		33,352		8,000								43,352	
North Carolina		110,590										110,590	
South Carolina		164,835										164,835	
Tennessee		82,416										82,416	
Virginia		95,236										95,236	
Other		102,213		6,872		49,428		2,634				189,449	

[1] Includes Arizona, 1; Arkansas, 1; Colorado, 3; Connecticut, 2; Delaware, 1; Florida, 5; Indiana, 3; Kansas, 1; Kentucky, 1; Massachusetts, 4; Michigan, 3; Mississippi, 5; Missouri, 1; Montana, 1; North Carolina, 12; Oklahoma, 1; South Carolina, 14; Tennessee, 7; Texas, 5; Utah, 2; Virginia, 9; Washington, 1; West Virginia, 2; and Wisconsin, 2.

Table 19 summarizes the production figures for sulphuric acid for 1919, 1914, and 1909, according to strength, as reported, with the conversion figures for same to basis of 50° acid. It shows also the per cent distribution according to strength, and the per cent distribution of that made and consumed, according to strength.

TABLE 19.—DISTRIBUTION OF SULPHURIC ACID PRODUCTION: 1919, 1914, AND 1909.

DISTRIBUTION ACCORDING TO STRENGTH.	1919	1914	1909
	Tons.	*Tons.*	*Tons.*
Total as reported	4,756,163	3,402,046	2,417,621
50°	2,750,112	1,701,233	1,643,281
60°	1,020,052	795,489	189,384
66°	834,195	828,466	552,619
Oleum and SO_3 [1]	151,804	77,758	32,337
Same expressed as 50°	5,552,581	4,071,566	2,764,455
50°	2,750,112	1,701,233	1,643,281
60° as 50°	1,275,064	994,361	236,730
66° as 50°	1,251,293	1,242,699	828,929
Oleum and SO_3 as 50°	276,112	133,273	55,515
Per cent distribution:			
Total	100.0	100.0	100.0
50°	57.8	41.8	59.4
60°	21.4	24.4	8.6
66°	17.5	30.5	30.0
Oleum and SO_3	3.2	3.3	2.0
Per cent of each strength made and consumed (total for each strength being 100):			
Total as 50°	39.8	37.0	46.0
50°	69.3	74.0	68.0
60°	6.9	31.0	6.0
66°	15.2	12.0	18.0
Oleum and SO_3	11.7	20.0	12.0

[1] Includes battery acid and electrolyte sulphuric, 4,694 tons.

The total for sulphuric acid made and consumed probably includes acid used in making mixed acid. Roughly calculated from the average unit values of the two acids concerned, the sulphuric acid so used, expressed as 50°, amounted to about 30,000 tons in 1919 and 27,000 tons in 1914.

Of the 216 establishments making sulphuric acid, 24 used the contact process, 7 both contact and chamber processes, and 185 the chamber process only. That is, 31 concerns, or about one-seventh of the number, employed contact conversion either entirely or partly. Estimating the amount of acid made by contact mass in establishments using both processes from the amounts of platinum reported as used, about 87,200 tons of 50° was so made; so that 1,228,619 tons, or 22.2 per cent, of all sulphuric acid were made by contact methods and 4,305,735 tons, or 77.8 per cent, by the chamber method.

Platinum used in contact mass amounted to 38,485 troy ounces. This, together with 3,366 ounces reported in use in stills and pans, gives a total of 41,851 ounces.

The production of sulphuric acid, basis of 50°, as shown in Table 16, is given in the following tabular statement, ranked by states, with percentages of distribution.

	Tons.	Per cent.
Total production	5,552,581	100.0
New Jersey	642,139	11.6
Pennsylvania	562,570	10.1
Illinois	542,783	9.8
Maryland	490,835	8.8
California	413,847	7.5
Ohio	372,356	6.7
Georgia	272,805	4.9
Alabama	157,829	2.8
New York	121,961	2.2
Louisiana	82,128	1.5
Other states	1,893,278	34.1

Sulphuric acid is produced by the burning of sulphur or pyrite or pyrrhotite, and as a by-product in the roasting or smelting of zinc and copper ores. The amount of such ores employed as material for sulphuric acid manufacture was not reported. During the war, owing to restrictions in foreign trade in pyrite, there resulted a large increase in the employment of sulphur as a raw material; and in 1919 acid makers, especially in the interior, continued the use of brimstone. Spanish pyrite was used only at the coast. As the demand for spelter and copper was subnormal, especially in the early months of 1919, tonnage from this source was less.

As material, 570,769 tons of sulphur and 1,146,958 tons of pyrite were employed in the various industries. Plants using sulphur were as a rule smaller in size, roughly averaging 2,000 tons, while concerns using pyrite averaged 10,000 tons. The weight of sulphur was 32.2 per cent of the total tonnage, but using the factors 4½ and 2¼ to estimate the quantity of 50° acid produced from sulphur and pyrite, respectively, we have from sulphur 2,382,746 tons of 50° acid; that is, 48.7 per cent, or about one-half of the total acid production, was from the burning of sulphur.

Production of sulphuric acid from zinc and copper ores.—Table 20 presents the statistics of production from zinc and copper ores (roasters and smelters), in 1919.

TABLE 20.—SULPHURIC ACID PRODUCTION FROM ZINC AND COPPER ORES: 1919.

[Ton, 2,000 pounds.]

	Number of establishments	Total production, tons.	Made and consumed, tons.	Produced for sale.	
				Tons.	Value.
Total	[1] 20	882,913	16,008	866,905	$8,253,423
Copper smelters, terms of 60° Bé.[2]	6	364,991	410	364,581	2,084,087
Zinc smelters and roasters, terms of 60° Bé.	14	517,922	15,598	502,324	6,165,336
As reported (zinc smelters)—					
50°–60°	.....	396,901	7,732	389,466	4,698,035
66° and sulphur trioxide	.....	79,148	5,287	73,861	1,467,301

[1] Distribution by states: From copper ores 6—Tennessee, 2; and 1 each in Arizona, California, New Jersey, and Utah. From zinc ores 14—Illinois, 7; Pennsylvania, 3; and 1 each in Kansas, Ohio, West Virginia, and Wisconsin.
[2] Includes some production under a pre-war long-term contract.

Products closely related to sulphuric acid are sulphur trioxide, sulphur dioxide, and sulphurous acid; also reclaimed acid. Sulphur trioxide was produced as a by-product of the zinc smelting industry, all by the contact process. It is included with oleum and fuming sulphuric acid. Sulphur dioxide, which is marketed as a compressed and liquefied gas, used in the bleaching industry, was made in three plants, all burning sulphur. Sulphurous acid, marketed in carboys, was also manufactured by three companies burning sulphur as the raw material, and like sulphur dioxide, is used for bleaching purposes.

Reclaimed sulphuric acid was reported in large quantities, a total of 473,555 tons, consisting of 426,315 tons, or 90 per cent, from the petroleum industry; 44,657 tons, or 9.4 per cent, from the explosives industry; and the residue from the acid industry. The amount sold as such was 95,119 tons, at an average value of $8.50 per ton. In 1914 the average value was $3.80 a ton.

In 1919 sulphuric acid was reclaimed in 65 establishments, 90.3 per cent, or 427,421 tons, being reported from 45 plants in nine states (New Jersey, Indiana, New York, California, Texas, Pennsylvania, Illinois, Missouri, and Louisiana). Eight plants in the state of New Jersey reclaimed 161,566 tons, or 34.1 per cent of the total.

Nitric acid.—Nitric acid ranks next to sulphuric in commercial importance.

Table 21 presents the statistics of production for 1919 and 1914.

TABLE 21.—NITRIC ACID: 1919 AND 1914.

	1919	1914
Number of establishments	[1] 59	52
Production, tons (2,000 pounds)	86,992	78,589
For sale—		
Tons	19,436	14,685
Value	$2,976,095	$1,591,625
Made and consumed, tons	67,556	63,904
Production, by establishments engaged primarily in the manufacture of:		
Sulphuric, nitric, and mixed acids	18,831	.....
For sale—		
Tons	3,861	9,794
Value	$642,018	$1,141,183
Made and consumed, tons	14,970	.....
Chemicals in general	18,962	.....
For sale—		
Tons	11,951	4,256
Value	$1,749,215	$385,259
Made and consumed, tons	7,011	.....
Explosives	48,588	.....
For sale—		
Tons	3,013	403
Value	$537,800	$53,760
Made and consumed, tons	45,575	.....
Other commodities—		
Tons	611	172
Value	$47,062	$11,423
Production, by states (all industries):		
Illinois	5,051	.....
For sale—		
Tons	798	552
Value	$149,800	$68,545
Made and consumed, tons	4,253	.....
New Jersey	28,918	.....
For sale—		
Tons	3,903	3,823
Value	$520,500	$1,043,597
Made and consumed, tons	25,015	.....
New York	4,212	.....
For sale—		
Tons	1,043	1,259
Value	$192,012	$107,261
Made and consumed, tons	3,169	.....
Pennsylvania	5,083	.....
For sale—		
Tons	980	500
Value	$211,945	$44,000
Made and consumed, tons	4,103	.....
All other states [2]	43,728	.....
For sale—		
Tons	12,712	3,551
Value	$1,901,838	$328,222
Made and consumed, tons	31,016	.....

[1] Distribution by states: Pennsylvania, 11; New Jersey, 11; California, 6; Illinois, 5; New York, 5; Missouri, 3; Colorado, 3; Michigan, 3; Connecticut, 2; Ohio, 2; and 1 each in Alabama, Delaware, Indiana, Massachusetts, Montana, Utah, Washington, and Wisconsin.
[2] In order of production, 1919: Massachusetts, Missouri, Wisconsin, California, Delaware, Ohio, Indiana, Colorado, Washington, Connecticut, Michigan, Utah, Montana, and Alabama.

Nitric acid was reported in many degrees of strength and purity from dilute to 38°, 40°, 42°, and 100 per cent, fuming, and chemically pure. Conversions to uniform grade have not been made. As an indication of the grades, prices ranged from $87 to $485 a ton.

The increase in tonnage from 1914 to 1919 was 10.7 per cent, a large proportion being used in the same establishment, 77.7 per cent in 1919 and 81.3 per cent in 1914. Calculating from the unit values of nitric acid and 66° sulphuric acid, the total weight of mixed acid contained 57 per cent or 65,484 tons of nitric acid in 1919 and 41.9 per cent or 46,980 tons in 1914, which amounts are included in the item made and consumed. At a uniform average value, the total tonnage of nitric acid amounted in value to $13,310,000 in 1919 and $8,488,000 in 1914.

During the years intervening between 1914 and 1919, the period of the World War, nitric acid must have been made in very large amounts. The 1919 census, however, does not indicate the increases due to the war.

All of the nitric acid reported was made by treatment of nitrate with sulphuric acid, no synthetic nitrogen being included.

The tonnage of the explosives industry was 55.9 per cent of all nitric acid reported. The acid industry shows 79.5 per cent of the acid as made and used in the same works, the chemical industry 37 per cent and the explosives industry 93.8 per cent.

Mixed acid.—Table 22 presents the statistics of production for mixed acid for 1919 and 1914.

Mixed acid increased in quantity 2.4 per cent from 1914 to 1919 but more than doubled in value, for amount sold as such. As with nitric acid, more mixed acid was consumed in the same plant than was sold as such, 59.6 per cent and 61.9 per cent, respectively, for 1919 and 1914. Prices were less variable than for nitric acid and ranged from $65 to $137 per ton. Strengths or proportions of the mixture were in no case indicated.

The sulphuric and nitric acids represented in mixed acid are included in the made and consumed items under the respective acids. Estimating the value of all mixed acid from the unit values for that sold as such, we have for 1919, $10,914,000 and for 1914, $5,718,000.

As with nitric acid, the table shows that much the larger part of mixed acid is produced in the explosives industry, 62.8 per cent in 1919.

TABLE 22.—MIXED ACID: 1919 AND 1914.

	1919	1914
Number of establishments	[1] 42	37
Production, tons (2,000 pounds)	114,886	112,124
For sale—		
Tons	46,428	42,725
Value	$4,426,637	$2,204,480
Made and consumed, tons	68,458	69,399
Production, by establishments engaged primarily in the manufacture of:		
Sulphuric, nitric, and mixed acids	32,036	.....
For sale—		
Tons	29,663	23,616
Value	$2,859,989	$1,294,381
Made and consumed	2,973	.....
Chemicals in general	10,076	.....
For sale—		
Tons	5,936	11,264
Value	$788,669	$723,386
Made and consumed, tons	4,140	.....
Explosives	72,174	.....
For sale—		
Tons	10,829	7,845
Value	$777,979	$186,713
Made and consumed, tons	61,345	.....
Production, by states (all industries):		
Illinois	11,925	.....
For sale—		
Tons	7,735	1,297
Value	$620,799	$97,710
Made and consumed, tons	4,190	.....
New Jersey	40,545	.....
For sale—		
Tons	15,633	18,541
Value	$1,403,103	$879,373
Made and consumed, tons	24,912	.....
Pennsylvania	8,117	.....
For sale—		
Tons	487	2,034
Value	$95,575	$111,952
Made and consumed, tons	7,630	.....
All other states [2]	54,299	.....
For sale—		
Tons	22,573	20,853
Value	$2,307,160	$1,115,445
Made and consumed, tons	31,726	.....

[1] Distribution, by states: Pennsylvania, 9; New Jersey, 6; Illinois, 5; Missouri, 3; 2 each in California, Colorado, Michigan, New York, Ohio, and Utah; 1 each in Alabama, Connecticut, Delaware, Indiana, Montana, Washington, and Wisconsin.
[2] In order of production, 1919: California, Missouri, New York, Delaware, Wisconsin, Connecticut, Washington, Utah, Colorado, Ohio, Michigan, Montana, Alabama, and Indiana.

Hydrochloric or muriatic acid.—Table 23 presents statistics for hydrochloric acid for 1919 and 1914.

The total tonnage, 221,749 tons, places it second in rank among the acids, the gain from 1914 to 1919 being 31.5 per cent. While a larger part of the total was made and consumed in 1914 than in 1919, both years showed considerable amounts so used—32.3 per cent in 1919 and 49.3 per cent in 1914.

Nearly all of the 40 establishments making hydrochloric acid reported it in 18° and 20° strengths; some was returned as 22° and as 100 per cent, while the purity ranged from commercial to chemically pure. Three establishments made it synthetically from electrolytic chlorine, three reported it as a by-

product from chlorination processes, while the bulk was made by the usual process from salt and sulphuric acid. The employment of niter cake, with 33 per cent available sulphuric acid, in lieu of sulphuric acid, apparently was not indicated. Prices ranged from $16 to $80 a ton.

The acid and chemical industries produced all of the hydrochloric acid reported in 1919, the total amount being about equally divided between these two branches of chemical manufacture.

TABLE 23.—HYDROCHLORIC ACID: 1919 AND 1914.

	1919	1914
Number of establishments	[1] 40	31
Production, tons (2,000 pounds)	221,749	168,584
For sale—		
Tons	150,090	85,438
Value	$4,312,253	$1,348,805
Made and consumed, tons	71,659	83,146
Production, by establishments engaged primarily in the manufacture of:		
Sulphuric, nitric, and mixed acids	109,087	.....
For sale—		
Tons	91,864	33,654
Value	$2,344,793	$495,030
Made and consumed, tons	17,223	.....
Chemicals in general	112,662	.....
For sale—		
Tons	58,226	[2] 51,784
Value	$1,967,460	$852,875
Made and consumed, tons	54,436	.....
Production, by states (all industries):		
New Jersey	22,855	.....
For sale—		
Tons	19,232	25,721
Value	$668,345	$406,986
Made and consumed, tons	3,623	.....
New York	19,507	.....
For sale—		
Tons	19,437	5,353
Value	$522,858	$78,334
Made and consumed, tons	70	.....
Pennsylvania	24,060	.....
For sale—		
Tons	22,068	13,679
Value	$733,558	$217,440
Made and consumed, tons	1,992	.....
All other states [3]	155,327	.....
For sale—		
Tons	89,353	40,685
Value	$2,387,492	$646,045
Made and consumed, tons	65,974	.....

[1] Distribution, by states: Pennsylvania, 8; New Jersey, 5; New York, 5; California, 4; Illinois, 3; Ohio, 3; 2 each in Colorado, Connecticut, and Massachusetts; and 1 each in Delaware, Indiana, Michigan, Louisiana, Kansas, and West Virginia. Of these, electrochemical production by 3 establishments—New York, 2, and West Virginia, 1.
[2] Includes 418 tons produced by manufacturers of other commodities.
[3] In order of production, 1919: Illinois, Indiana, Ohio, Delaware, Massachusetts, California, Kansas, Louisiana, Colorado, Connecticut, West Virginia, and Michigan.

By-products from the manufacture of nitric and hydrochloric acids are niter cake and salt cake, included in Group III, Sodium compounds. The production of niter cake, calculated from the nitric acid, with an assumed average of 61 per cent strength, must have been approximately 270,000 tons, valued at $931,500, and of dry salt cake from the manufacture of 30 per cent hydrochloric acid approximately 250,000 tons of a value of $3,800,000.

Carbonic acid or carbon dioxide.—Carbon dioxide or CO_2 is the acid anhydride of a hypothetical acid of the composition $CO(OH)_2$, which supposedly exists in water solution but can not be separated as such. Salts of this acid indicate such a formula. The commercial value of free carbonic acid or CO_2 consists in the fact that at ordinary temperatures it is a gas that can be compressed and liquefied so as to be readily transported; that the raw materials for its production are plentiful and cheap; that it has a pleasant and slightly acid taste and is not toxic. Its principal use is in effervescing drinks.

Liquefied carbon dioxide is second in rank among acids for the value of product actually sold. None was reported as made and consumed by the same establishment. Second in value and third in amount produced for sale, carbonic acid ranks among the major acids. The statistics of production for the censuses, 1899 to 1919, inclusive, are given in Table 24. Growth in this industry since 1909 has been steady but not phenomenal in number of establishments or in quantity, which increased 5 per cent from 1909 to 1914, and about 20 per cent from 1914 to 1919.

TABLE 24.—CARBONIC ACID GAS, OR CARBON DIOXIDE (CO_2).

		Number of establishments.	Pounds.	Value.
United States	1919	42	59,771,411	$6,574,250
	1914	38	50,445,779	2,320,685
	1909	35	47,953,291	2,345,743
	1904	.....	35,991,627	1,343,966
	1899	.....	12,084,281	719,364
By states: [1]				
Illinois		4	9,142,964	1,051,975
Ohio		5	5,547,003	597,936
Pennsylvania		3	2,534,220	303,137
All other		30	42,547,164	4,621,202

[1] States and number of establishments in order of quantity production: New York, 5; Illinois, 4; New Jersey, 2; Ohio, 5; Georgia, 2; Massachusetts, 4; California, 4; Missouri, 3; Virginia, 1; Pennsylvania, 3; Texas, 2; Tennessee, 2; Louisiana, 1; Minnesota, 1; Kentucky, 1; and Wisconsin, 1.

Minor acids, inorganic.—*Arsenic acid* production 2,622,389 pounds, was by oxidation with litharge or nitric acid from 1960 tons of arsenious acid or white arsenic, reported by six establishments in New Jersey, Illinois, Maryland, California, and Michigan. Arsenious acid is a product of the smelting and refining industries. Much of the arsenic used for making arsenical insecticides is derived from the latter sources.

Boric or boracic acid was reported by six plants in five states—New Jersey, Pennsylvania, California, New York, and Missouri. Three concerns produced 12,757,296 pounds from colemannite or other borate ores and three produced the crude material and refined 696,804 pounds. All of the boric acid reported was of refined grades, prices varying from 11 cents to 20 cents per pound, and averaging 12 cents.

Hydrofluoric acid, made from fluorspar and sulphuric acid, totaling 5,732,198 pounds, was reported by six plants in five states—New York, Pennsylvania, Ohio, New Jersey, and Connecticut. About 25 per cent was made and consumed in further manufacture by the same establishment. Prices ranged from 10 to 44 cents a pound for chemically pure grade. Hydrofluoric acid has been reported in the last three censuses with a decrease in quantity and number of establishments.

Phosphoric acid production, 22,109,302 pounds, was reported by nine establishments in six states—New Jersey, Rhode Island, Illinois, New York, Missouri, and Delaware. A large proportion, 8,729,801 pounds, or 39.5 per cent, was made and reused. All of that reported was made from bone or phosphate rock and sulphuric acid. A number of grades were shown, 40 per cent, 50 per cent, 85 per cent, U. S. P., and the pentoxide or acid anhydride, and prices varied from 8 to 32 cents a pound, averaging 13 cents.

Other inorganic acids, comprising chlorosulphonic, sulphur dioxide (sulphurous acid anhydride), hydrofluosilicic, tungstic, vanadic, molybdic, chromic, hydrobromic, hypophosphorus, silicic, and sulphurous acids, in order of value as named, amounted to $797,514, and miscellaneous unenumerated acids to $39,263.

Organic acids.—The total value of organic acids for 1919 was $26,318,237, and so far as they could be separated the corresponding value for 1914 was $7,754,381. Organic acids as a group, therefore constituted 31.1 per cent of the value of all acids. In order of decreasing weight they ranked acetic, oleic, stearic, tartaric, and citric, while in value acetic dropped from first to last place. That is, acetic acid was produced in the largest quantity at much the lowest unit value.

Acetic acid.—Acetic acid was reported in 1919 in the three grades of dilute, including pyroligneous, glacial or 100 per cent, and anhydride. The totals of all grades for three census years are given in the following tabular statement:

	1919	1914	1909
Number of establishments	18	13	13
Total production ... pounds	64,175,275	75,303,375	58,000,602
For sale ... pounds	53,516,597	70,617,637	56,923,773
Value	$4,264,044	$1,272,294	$1,336,874
Unit value	$0.107	$0.018	$0.024
Made and consumed	10,658,678	4,685,738	1,076,829
Per cent made and consumed	17.0	6.0	2.0

The larger number of plants manufactured dilute acetic acid from calcium acetate and sulphuric acid. Production by fermentation of alcohol and by purification of pyroligneous acid was also reported. Strength and quality ranged from crude and commercial to 28 per cent, 36 per cent, 56 per cent, redistilled, and U. S. P., prices for crude to 28 per cent being 2½ to 5 cents a pound, and for 56 per cent from 7 to 8½ cents a pound.

All of the glacial acetic acid was made from acetate of lime as the raw material. Acetic anhydride was partly made from acetate, from dilute or glacial acetic acid purchased as such, and from acid derived by fermentation of alcohol or of kelp. Both phosphorus and sulphur chlorides were employed for the dehydration. No synthetic acetic anhydride or acid was reported. Four establishments making glacial acetic also reported the dilute acid, but those producing the anhydride made no other form of acetic acid.

Stearic acid retained about the same relative position among acids, in rank, while *oleic acid* rose relatively. These acids are produced simultaneously from the same raw materials, the production of one being limited by the production of the other; but as liquid fats contain a greater proportion of oleic acid, it is possible to select raw material with the view of increasing one or the other of these two ingredients. Shortage of importation of olive-oil foots within recent years may account in part at least for underproduction and high price of the more liquid fatty acid.

The nine establishments reporting stearic acid also produced oleic, a large proportion of both being derived from animal fats, greases, and tallow, some from soy-bean oil, cottonseed-oil foots, and other vegetable sources. The totals included among products in the table are exclusive of oleic and stearic acids made and consumed in the soap industry, which is the largest producer of these fatty acids. In order of production the states rank for stearic acid, Ohio, New York, Pennsylvania, New Jersey, and Montana, while for oleic acid the order is Ohio, Pennsylvania, New Jersey, New York, Indiana, Montana, and Rhode Island. The proportion of stearic to the total in the nine establishments making both acids varied from 21 to 50 per cent, the average being 33 per cent, or about one-third of the total.

Tartaric, citric, and *lactic* acids are used for many of the same purposes—as components of soft drinks and effervescing salts or in the textile industries. The four establishments making tartaric acid were located in New York, Ohio, and California and employed argols as raw material.

Six plants in four states—New York, Pennsylvania, New Jersey, and California—produced citric acid from citrate of lime in the East and from cull lemons in the West.

Four establishments in three states—Massachusetts, Pennsylvania, and Missouri—produced lactic acid from various organic materials by specific bacterial fermentation.

Tannic acid was produced by four establishments in three states—New York, Missouri, and Pennsylvania—two of these being refiners and manufacturers of medicinal or U. S. P. grades, and two engaged primarily in the manufacture of dyestuffs and extracts from original sources.

Other organic acids consisted of hydrocyanic, gallic, oxalic, pyrogallic, creosote, carbolic, monochloracetic, thymol or thymic, formic, butyric, phthalic anhydride, cresol or cresylic, valerianic or valeric, propionic, and glycerophosphoric, in order of value as named.

Hydrocyanic or prussic acid is used for fumigating citrus fruits and was practically all reported from

California, except small amounts refined in the East. Although as an acid it is included in Group I, it is also a cyanogen derivative, and its principal value depends upon the properties of the cyanogen present, so that it is included primarily in Group II, Cyanogen compounds. Sodium cyanide and fruit pits were used as raw materials.

Gallic and pyrogallic acids were produced in refined and medicinal qualities only, from tannic and gallic acids, respectively. *Formic and oxalic acids* resulted in part from synthetic processes, from caustic and sawdust, and two establishments refined only. The *carbolic acid* reported includes only that made in establishments engaged in the chemical industries and does not cover that made and used in the coal-tar industries. It resulted from synthetic processes by the usual method of sulphonation and fusion in caustic. One establishment refined only, to 100 per cent grade. *Monochloracetic acid* was made by use of acetate of lime and electrolytic chlorine.

Creosote was of refined quality for medicinal purposes and was derived from wood tar; *thymol or thymic acid* was derived by the usual method from thyme oil; *butyric* and *propionic acids* by specific bacterial fermentation of starch, corn sugar, molasses, or other carbohydrate material; *phthalic acid anhydride* resulted from catalytic processes, using naphthalene and toluene as raw material; cresol or *cresylic acid* was a refined product; *valerianic acid* was the result of oxidation of fusel oil with bichromate and sulphuric acid, and *glycerophosphoric acid* by the combination of glycerine with phosphoric acid.

GROUP II.—AMMONIUM AND CYANOGEN COMPOUNDS.

Ammonium and cyanogen compounds, presented in Table 25, constitute an important chemical group, particularly when all forms of commercial nitrogen and its combinations are considered. The following is a summary of some of the values reported in 1919, that might be enumerated as "Nitrogen and fixed nitrogen compounds."

	Group No.	Value.
Total nitrogen compounds	.....	$98,079,732
Ammonium and cyanogen compounds	II	23,067,553
Nitrogen compounds, other groups:		
Nitrogen gas	IX	45,416
Nitrous oxide gas	IX	515,164
Nitric acid	I	2,976,095
Mixed acid, 57 per cent nitric	I	3,648,658
Nitrates, nitrites	I to X	5,971,823
Ammonic alum, amines, cyanides	V and X	751,441
Pyroxylin, nitrocellulose	VIII	33,979,217
Ammonia and ammonium sulphate—Gas and coke industries	.....	27,124,365

If to the above there is added the values of the nitro, nitroso, amido and amino compounds, proteins and alkaloids, of the coal-tar, explosives, fertilizer, textile, pharmaceutical and other primary industries, the total would inadequately express the value of nitrogen in the cycle of industrial operations.

With the exception of some ammonia, ammonium chloride and sulphate, and cyanide, made from cyanamid and metallic sodium produced electrolytically, no nitrogen reported for the year 1919, was fixed by synthetic processes.

TABLE 25.—GROUP II.—AMMONIUM AND CYANOGEN COMPOUNDS.

	1919	1914	1909
Value of products	$23,067,553	$8,064,913	(1)
Ammonia, anhydrous: [2]			
Number of establishments	39	14	15
Total production, pounds	27,957,000	.....	.....
For sale—			
Pounds	27,530,000	16,659,789	11,969,846
Value	$7,224,473	$3,140,848	$2,544,238
Unit value, pound	$0.29	$0.19	$0.21
Made and consumed, pounds	427,000	.....	.....
Ammonia, aqua:			
Number of establishments	27	.....	.....
Total production, pounds	45,467,000	.....	.....
For sale—			
Pounds	30,918,000	35,544,246	20,983,476
Value	$2,241,321	$1,412,236	$839,820
Unit value, pound	$0.07	$0.04	$0.04
Made and consumed, pounds	14,549,000	.....	.....
Ammonium chloride (sal ammoniac):			
Number of establishments	8	3	.....
Pounds	13,212,619	11,511,934	.....
Value	$1,565,340	$641,040	(1)
Unit value, pound	$0.12	$0.06	.....
Ammonium sulphate: [3]			
Number of establishments	16	.....	.....
Total production, pounds	33,401,000	.....	.....
For sale—			
Pounds	32,873,000	8,846,616	.....
Value	$1,595,447	$211,314	(1)
Unit value, pound	$0.05	$0.02	.....
Made and consumed, pounds	528,000	.....	.....
Ammonium bromide and iodide:			
Number of establishments	4	.....	.....
Value	$160,523	(1)	(1)
Ammonium fluoride:			
Number of establishments	3	.....	.....
Pounds	340,156	(1)	(1)
Value	$94,276	.....	.....
Cyanogen compounds:			
Ferro and ferricyanides of sodium, potassium, iron (Prussian blue), and calcium—			
Number of establishments	14	.....	.....
Pounds	4,684,611		
Value	$1,467,665		
Other—Hydrocyanic (prussic) acid, cyanides of copper, gold, mercury, nickel, potassium, silver, sodium, and zinc; cyanogen chloride, dicyandiamine, thiocyanates of ammonium, barium, and sodium, value	$5,647,777	$2,398,674	$1,941,803
Other ammonium compounds:			
Inorganic—Ammonium alum, ammonium chrome alum, carbonate, hypophosphite, nitrate, persulphate, phosphate, sulphide, vanadate, and miscellaneous, value	$2,759,616		
Organic—Acetate, benzoate, diphenylamine, hexamethylenetetramine, oxalate, valerate, value	$311,115	$260,801	(1)

[1] Figures not available.

[2] Product of the chemical and manufactured gas industries. The production of anhydrous ammonia by the by-product coke ovens, as reported by the Geological Survey (mainly ammoniacal liquor and sulphate sold on pound basis of NH^3) was as follows: 1919, 34 establishments, 51,646,764 pounds; value, $5,692,950 (unit value 11 cents a pound); 1914, 25,370,509 pounds, value, $2,300,137 (unit value, 9 cents a pound).

[3] Product of the chemical, fertilizer, and manufactured gas industries. The production of ammonium sulphate by the by-product coke ovens, as reported by the Geological Survey, was as follows: 1919, 36 establishments, 544,231,985 pounds, sales, 557,619,631 pounds, value, $21,075,718 (unit value, 3¾ cents a pound); 1914, ammonia sulphate or reduced to equivalent in sulphate, 170,763,906 pounds, value $4,696,590 (unit value, 2¾ cents a pound).

Ammonium compounds, as shown in Group II, were valued at $15,952,111, and cyanogen compounds $7,115,442. Aqua and anhydrous ammonia constituted 59.3 per cent of all ammonium compounds, and the sulphate 10 per cent. If ammonia and ammonium sulphate of the coke and gas industries be included, however, the total for ammonium compounds is $43,076,476, of which aqua and anhydrous ammonia form 37.9 per cent and the sulphate 51.6 per cent. Some duplication is shown in the figures for aqua ammonia.

Since 1914 aqua ammonia has increased 28 per cent in amount produced but decreased in amount sold, while the production of anhydrous ammonia has increased 68 per cent.

The materials reported as employed for aqua and anhydrous ammonia were ammoniacal liquor, ammonium sulphate with lime to liberate the fixed ammonia, and cyanamid. The strengths of solutions were not reported with sufficient clearness to make an estimate of total NH_3 possible. Among products some reports gave the strength of aqua ammonia as 16°, 20°, and 26°, the prices being 2–3 cents, 4–5 cents, 6 cents and above, respectively. Using the price as a basis of estimating the strength when not stated, the total of 45,466,904 pounds of aqua ammonia reported by the chemical industry consisted of 16,163,315 pounds of 20° (including a very small amount of 16°), or about 36 per cent of the total, and 29,303,589 pounds of 26°, or 64 per cent. Taking the 20° liquor as 17 per cent NH_3 and 26° as 24 per cent NH_3, the ammonia content of aqua ammonia reported by chemical establishments was 10,952,770 pounds. This amount, together with 27,529,599 pounds of anhydrous ammonia of the chemical industry and 51,646,764 pounds from the coking industry makes the equivalent of 90,129,133 pounds of anhydrous ammonia produced in 1919.

Aqua ammonia was reported by 27 establishments in 14 states. Eight states—Pennsylvania, Washington, New Jersey, Rhode Island, Ohio, Michigan, Missouri, and Massachusetts—each produced over 2,000,000 pounds, and aggregated 90.7 per cent of the total. Four establishments in Pennsylvania alone produced 49.7 per cent of the total.

Anhydrous ammonia, 27,529,599 pounds, was produced by 39 establishments in 21 states. Eighteen plants in 6 states—Missouri, Illinois, Pennsylvania, New York, Ohio, and Washington—totaled 91.9 per cent of the whole, while the first 3 states, in 8 establishments, produced 75.7 per cent.

Ammonium sulphate produced by the chemical, gas, and fertilizer industries, exclusive of coke, aggregated 33,400,598 pounds made by 16 establishments in 10 states. Seven establishments in New Jersey, Massachusetts, and Pennsylvania reported 93.3 per cent of the total. The coke industry produced 557,619,631 pounds, so that a total of 591,020,229 pounds, or 295,510 tons, of ammonium sulphate was manufactured in 1919.

Other salts of ammonium were derived by neutralization of an acid by ammonium hydroxide. The latter was obtained from ammoniacal liquors, aqua ammonia, ammonium sulphate and caustic alkali or cyanamid. The acids were made by the usual methods—hydrobromic and hydrochloric acids largely from electrolytic bromine and chlorine, valerianic acid by the oxidation of fusel oil with bichromate and sulphuric acid, and vanadic acid from carnotite ore. Ammonium salts, excepting the sulphate, were 30.6 per cent of ammonium compounds, the chloride and phosphate constituting a large part.

Cyanogen compounds included within the chemical industry amounted in value to $7,115,442, or an increase of 196 per cent over 1914. Part was derived from electrolytic sodium or cyanamid. The greater proportion of the ferrocyanide group consisted of Prussian blue and the larger part of the cyanides of the sodium derivative, and hydrocyanic acid. Cyanogen chloride and dicyandiamine were derived from electrolytic chlorine and cyanamid, respectively. A large part of the cyanogen compounds were produced from cyanogen press-cake.

GROUP III.—SODAS, SODIUM, AND COMPOUNDS.

Table 26 presents the statistics for the sodium group for 1919, 1914, and 1909.

TABLE 26.—GROUP III.—SODAS, SODIUM, AND COMPOUNDS.

	1919	1914	1909
Value of products	$99,689,828	[1] $32,626,335	[1] $25,048,019
INORGANIC.			
Sodium:			
Borate (borax)—			
Number of establishments	8	7	.....
Tons	29,635	26,501	20,154
Value	$4,622,286	$2,071,774	$1,756,922
Unit value, ton	$156	$78	$87
Bichromate—			
Number of establishments	5	4	.....
Total production, tons	[1] 24,081	.....	.....
For sale—			
Tons	22,992	11,824	(2)
Value	$5,337,389	$1,125,398	.....
Unit value, ton	$239	$95	.....
Made and consumed, tons	1,089	.....	.....
Bromide—			
Number of establishments	5	.....	.....
Pounds	1,242,443	(2)	(2)
Value	$511,812	.....	.....
Carbonates—			
Soda ash—			
Number of establishments	18	10	11
Total production, tons	1,507,424	.....	.....
For sale—			
Tons	1,033,480	935,305	646,057
Value	$31,105,149	$10,937,945	$10,362,656
Unit value, ton	$30	$12	$16
Made and consumed, tons	473,944	.....	.....
Sal soda (including monohydrate crystals)—			
Number of establishments	41	50	50
Tons	82,992	106,501	86,644
Value	$2,272,770	$1,510,449	$1,156,882
Unit value, ton	$27	$14	$13
Bicarbonate—			
Number of establishments	10	5	7
Total production, tons	190,894	.....	.....
For sale—			
Tons	141,556	90,169	82,800
Value	$3,695,417	$1,439,014	$1,515,045
Unit value, ton	$26	$16	$18
Made and consumed, tons	49,338	.....	.....
Sesquicarbonate—			
Number of establishments	5	.....	.....
Tons	37,854	(2)	(2)
Value	$985,500	.....	.....
Fluoride—			
Number of establishments	4	.....	.....
Pounds	1,364,441	(2)	(2)
Value	$177,420	.....	.....
Hydroxide (caustic soda)—			
Number of establishments	29	25	17
Total production, tons	333,361	.....	.....
For sale—			
Tons	322,746	291,539	131,612
Value	$20,792,695	$9,104,920	$5,264,887
Unit value, ton	$64	$43	$40
Made and consumed, tons	10,615	.....	.....
Iodide—			
Number of establishments	7	.....	.....
Pounds	29,284	(2)	(2)
Value	$103,868	.....	.....

(See footnotes at end of table.)

TABLE 26.—GROUP III.—SODAS, SODIUM, AND COMPOUNDS—Con.

	1919	1914	1909
INORGANIC—continued.			
Sodium—Continued.			
Nitrate, refined—			
Number of establishments	7		
Tons	10,153	(3)	(3)
Value	$934,643		
Phosphate—			
Number of establishments	10	6	
Total production, tons	23,867		
Monobasic (4 establishments)	4,321		
Dibasic (9 establishments)	9,663		
Tribasic (5 establishments)	9,883		
For sale—			
Tons	22,351	15,397	12,290
Value	$2,438,917	$853,528	$540,282
Unit value, ton	$109	$55	$44
Made and consumed, tons	1,516		
Silicate—			
Number of establishments	21		
Total production, tons	336,093	190,648	
For sale—			
Tons	286,791	109,049	34,170
Value	$6,052,318	$1,648,854	$366,621
Unit value, ton	$21	$10	$11
Made and consumed, tons	49,302	21,599	
Sulphates—			
Niter cake—			
Number of establishments	38	31	24
Total production, tons	97,836	46,143	
For sale—			
Tons	81,170	24,129	27,546
Value	$281,476	$31,580	$53,693
Unit value, ton	$3.47	$1.30	$1.95
Made and consumed, tons	16,666	22,014	
Salt cake—			
Number of establishments	34	29	
Total production, tons	179,003	110,263	
For sale—			
Tons	122,908	90,442	(3)
Value	$1,930,139	$841,887	
Unit value, ton	$16	$9	
Made and consumed, tons	56,095	19,821	
Glauber's salt—			
Number of establishments	27	20	
Total production, tons	42,206		
For sale—			
Tons	38,330	34,537	46,471
Value	$864,264	$427,808	$512,464
Unit value, ton	$22	$12	$11
Made and consumed, tons	3,876		
Refined anhydrous—			
Number of establishments	6		
Total production, tons	2,776		
For sale—			
Tons	2,708	(3)	(3)
Value	$221,232		
Unit value, ton	$82		
Made and consumed, tons	68		
Thiosulphate (Hypo)—			
Number of establishments	9		
Total production, tons	29,818		
For sale—			
Tons	29,678	(3)	(3)
Value	$1,541,087		
Made and consumed, tons	140		
Sulphide—			
Number of establishments	17	5	
Total production, tons	39,735		
For sale—			
Tons	35,178	20,263	7,673
Value	$2,316,253	$516,644	$206,450
Unit value, ton	$66	$25	$27
Made and consumed, tons	4,557		
Sulphite—			
Number of establishments	8	5	
Total production, tons	8,666		
For sale—			
Tons	7,209		(3)
Value	$539,636	$66,649	
Unit value, ton	$75		
Made and consumed, tons	1,457		
Washing compounds (not containing soap)—			
Number of establishments	3	7	
Tons	861	12,441	(3)
Value	$71,021	$204,230	
Other inorganic sodium compounds,[5] value	$7,021,278	$1,703,535	(3)
ORGANIC.			
Sodium:			
Acetate—			
Number of establishments	12		
Total production, pounds	2,260,459		
For sale—			
Pounds	2,196,113	(3)	(3)
Value	$165,505		
Made and consumed, pounds	64,346		
Benzoate—			
Number of establishments	4		
Pounds	120,447		(3)
Value	$68,004	$61,490	
Citrate—			
Number of establishments	6		
Pounds	118,417		
Value	$143,386		
Other organic sodium compounds,[6] value	$5,706,363	$80,630	(3)

(See footnotes at end of table.)

TABLE 26.—GROUP III.—SODAS, SODIUM, AND COMPOUNDS—Con.

DISTRIBUTION OF NUMBER OF ESTABLISHMENTS, BY GEOGRAPHIC DIVISIONS: 1919.

	Total number.	New England.	Middle Atlantic.	East North Central.	West North Central.	South Atlantic.	South Central.	Mountain.	Pacific.
INORGANIC									
Sodium:									
Borate	8		4	1					3
Bichromate	5		3	1		1			
Bromide	5		1	2	1	1			
Carbonate—									
Soda ash	18		4	4	2	4			4
Sal soda	41	2	11	6	3	2		3	14
Bicarbonate	10		4	2	1	2			1
Sesquicarbonate	5		2	1					2
Fluoride	4		3	1					
Hydroxide (caustic)	29	4	12	7	2	3			1
Iodide	7		6		1				
Nitrate	7		3	1	2				1
Phosphate	10		7		1	2			
Silicate	21		8	8	2				3
Sulphate—									
Niter cake	38	3	15	9	2	3	1	4	1
Salt cake	34	3	15	8	1	2	2	2	1
Glauber's salt	27	3	12	3	4	2			3
Ref. anhydrous	6		5		1				
Thiosulphate	9		5	1	1	1			1
Sulphide	17	1	7	4	2	2	1		
Sulphite	8		5		1	1			1
Washing compounds	3		1			1			1
ORGANIC.									
Sodium:									
Acetate	12		9	2	1				
Benzoate	4		3		1				
Citrate	6		5		1				

[1] The totals for items reported 1914, $32,626,335, and 1909, $25,048,019, are not comparable with total for 1919. The total for 1909 ($25,048,019) includes $3,312,117 of unclassified sodium products not shown in detail.
[2] Includes neutral chromate.
[3] Figures not available.
[4] Includes caustic liquor and soda lye.
[5] Includes, 1919, sodium metal, sodium chlorate, hypophosphite, manganate, nitrate, silicofluoride, burnt, chrome and sodium alums, aluminate, aluminum fluoride (refined cryolite), arsenate, arsenite, bisulphite, gold chloride, hypochlorite, perborate, peroxide, titanium sulphate, uranate, uranium nitrate, etc.
[6] Includes, 1919, sodium butyrate, formate, oxalate, propionate, sulphocarbolate, cyanide and ferrocyanide, formaldehyde-hydrosulphite, potassium tartrate, thiocyanate, uranium acetate, etc.

The manufacture of sodium compounds for the year 1919, exclusive of common salt, rock salt, and brines and of sodium salts produced in other special industries such as coal-tar chemicals and dyestuffs, amounted to more than three times the value of the previous census, and reached the grand total of nearly 3,000,000 tons and $100,000,000, of which products to the value of $9,042,986 have also been included within other classifications in this report. Sodium cyanides, alums, bleaching compounds, and electrolytic products appear here and elsewhere in these tables.

The increase in the use of sodium compounds is probably in part due to the substitution of sodium for potassium in bichromates, cyanides, nitrates, prussiates, hydroxide, and other salts, which, previous to the shortage caused by the war, were considered inferior for certain industrial applications, notably in the making of nitrate explosives, the oxidation of aniline black and the production of Prussian blue. After being subjected to more careful methods of purification in order to remove deliquescent salts and other impurities, sodium compounds have been found in many instances to be fully equal or better than potassium, the forced recognition of which fact will be of lasting benefit to industry.

Demand for the principal soda products—soda ash, bicarbonate, caustic, and bleaching powder—slumped in the early part of 1919, factories running at from 25 to 30 per cent capacity until June, but from then on until October and November, though manufacturing costs continued high, demand and activities increased until they reached pre-war conditions. Extensive exports of finished goods dependent upon alkalies for their preparation, glass, soap, petroleum products, textiles, and various sodium chemicals, at least in part caused this increased output.

Sodium compounds are very largely used in the textile, leather, and paper industries, as the following statement will show:

SODIUM SALT.	Employed in—
Acetate	Mordant manufacture.
Alum	Mordanting of paper and textiles, loading, sizing.
Aluminate	Mordanting.
Arsenate	Dyeing.
Bichromate and chromate	Chrome tanning, textile mordant, printing, bleaching.
Bisulphate	Dyeing (substitute for sulphuric acid).
Bisulphite	Dyeing, paper bleaching, source of SO^2.
Borate	Tanning, sizing, mordanting, fireproofing.
Carbonates	Dyeing, printing, cleansing, bleaching, degumming.
Chlorate	Dyeing, printing, oxidizing agent.
Formaldehyde—hydrosulphite.	Reducing agent in vat dyeing, bleaching, discharging, printing.
Hydroxide (caustic)	Tanning, mercerizing, manfacturing of dyes, wood pulp, and paper.
Hypochlorite	Bleaching, other oxidizing processes.
Nitrite	Diazotizing in the manufacture of azo dyes, nitroso compounds, and in dyeing textiles.
Oxalate	Textile processes.
Perborate	Bleaching, oxidizing.
Peroxide	Bleaching, oxidizing.
Phosphate	Textiles, especially silk weighting and dyeing.
Prussiate	Manufacturing of Prussian blue for calico dyeing, printing.
Silicate	Fireproofing, dyeing, bleaching adhesive in fiber and paper board, sizing, soap making.
Sulphates	Dyeing (fixing and equalizing agent), manufacture of ultramarine and sodium sulphide.
Sulphide	Dyeing sulphur colors, tanning, artificial silk manufacture, sulphide colors, depilatory agent.
Thiosulphate	Chrome tanning, antichlor in bleaching, paper manufacture, mordanting, manufacture of coal-tar green.
Titanium sulphate	Mordanting.
Washing compounds	Cleansing.

In the paper industry, for instance, for the production of sulphite, soda and sulphate pulps, large amounts of soda ash, salt cake, and niter cake are employed; alum serves as a sizing or fixing agent for dyes, the silicate acts as an adhesive in laminated papers like wall boards. For boiling rags, caustic or carbonate is employed, and, for bleaching of rags or pulp, the hypochlorite is used.

Of those compounds which have been included in "Other sodium compounds," the outstanding items arranged in the order of their value are cyanide, metal, prussiate, chlorate, aluminum fluoride, formaldehyde-hydrosulphite, peroxide, alums, potassium tartrate, and hypophosphite.

The two important sodium compounds, soda ash and caustic, are preeminently in the lead both in quantity and value of production and together constitute 61 per cent of the quantity and 52 per cent of the value of the entire group.

It can readily be seen that the total of 49,338 tons of bicarbonate of soda reported as made and consumed in further manufacture is but a fraction of that required for the manufacture of the soda ash, crystalline carbonate and sesquicarbonate reported. Making the necessary calculations from the formulas of these salts (soda ash, Na_2CO_3; sesquicarbonate, $Na_4H_2(CO_3)_3 \cdot 3$ aq., and Na_2CO_3 10aq., with factors of 1.60, 1.03, and 0.59, respectively) and adding the weight of bicarbonate reported sold as such, the total amount of bicarbonate made amounted to 2,691 thousand-ton units.

Salt cake and niter cake, at one time considered as by-products and more or less a drug upon the market, advanced in both price and value, niter cake showing phenomenal gains, to more than double the quantity and nearly three times the price. This would indicate that many new uses have been found for niter cake as a substitute for sulphuric acid and other acids and acid salts in the explosives, soap, fertilizer, paper, dyeing, tanning, and other industries.

The manufacture of bichromate and sulphide, both used largely in the textile and leather industries, has increased very considerably so that these salts rank among the more important sodium compounds judging by the amounts and value of their output.

More than 50 separate compounds of sodium were reported in the 1919 census, some of which were derived by simple processes and others by involved methods, especially from the engineering standpoint. Briefly, they were derived in the following ways:

SODIUM SALT.	Process or method of manufacture.
	From original sources.
Biborate	Natural borate, or calcium ore, roasted then boiled with sodium carbonate.
Carbonate	From "Trona" by fractional crystallization.
Chloride	Natural brines and salt mines.
Fluoride	Cryolite, roasted, then boiled with carbonate.
Nitrate	Mined in Chili, refined.
Sulphate	From natural brines by fractional crystallization.
	Single and simple operation.
Alums	Sodium and aluminum sulfates crystallized from solution to form double salt.
Sodium gold chloride	Two salts crystallized together from solution, as with alums.
Carbonate, soda ash	Calcined bicarbonate (loss of water).
Carbonate, crystals	Crystallized from water solution.
Carbonate, sesqui	Bicarbonate heated in solution (loss of CO_2, addition of water).
Thiocyanate	Sodium cyanide solution boiled with sulphur.
	Neutralization in solution.
Acetate	Carbonate and acetic acid.
Aluminate	Carbonate and aluminum hydroxide.
Arsenite	Carbonate and arsenious oxide.
Benzoate	Carbonate and benzoic acid.
Bicarbonate	Carbonate and carbon dioxide.
Bisulphite	Carbonate and sulphur dioxide (caustic also used).
Butyrate	Hydroxide and butyric acid.
Chromate	Carbonate and bichromate.
Fluoride	Carbonate and hydrofluoric acid.
Glycerophosphate	Carbonate and glycerophosphoric acid.
Hypophosphite	Carbonate and hypophosphorous acid.
Oxalate	Carbonate and oxalic acid.
Propionate	Carbonate and propionic acid.
Silicofluoride	Carbonate and silicofluoric acid (fluosilicic).
Sulphite	Carbonate and sulphur dioxide.
Sulphocarbolate	Carbonate and sulphocarbolic acid.
Tartrate	Carbonate and acid tartrate.
	Substitution of sulphuric acid for another acid.
Bisulphate	Sulphuric acid acting on a nitrate (niter cake).
Sulphate	Sulphuric acid acting on a chloride (salt cake).

SODIUM SALT.	Process or method of manufacture.
	Interchange in solution, solid precipitate formed and removed.
Acetate	Calcium acetate and sodium sulphate.
Bromide	Iron bromide and sodium carbonate.
Citrate	Calcium citrate and sodium sulphate.
Ferrocyanide	Calcium ferrocyanide and sodium carbonate.
Hydroxide	Calcium or barium hydroxide and sodium sulphate.
Iodide	Iron iodide and sodium carbonate.
Phosphate	Dicalcium phosphate and sodium carbonate.
Thiosulphate	Calcium thiosulphate and sodium sulphate.
	Oxidation.
Arsenate	Sodium arsenite oxidized with $NaNO_3$ by calcination or fusion.
Ferricyanide	Ferrocyanide oxidized with chlorine in solution.
Manganate	MnO_2 fused with NaOH or Na_2CO_3 and $NaNO_3$.
Perborate	Borax heated slightly in solution with Na_2O_2 or H_2O_2.
Peroxide	Metallic sodium heated to 300° in aluminum trays in current of dry air, free of CO_2.
Thiosulphate	Sulphide liquor from Leblanc soda process oxidized by air, Na_2SO_4 added to calcium salt.
	Combination and interchange usually by aid of heat.
Bicarbonate	Salt, ammonia and carbon dioxide (Solvay process) combined under pressure and heat.
Bichromate	Fusion of chrome ore with lime and soda, and solution of product separated by sulphuric acid.
Cyanide	Sodamid ($NaNH_2$) heated with carbon and sodium cyanamid.
Ferrocyanide	Purified spent oxide from gas works heated with lime, calcium ferrocyanide salted out, and calcium separated by sodium carbonate.
Formate	Caustic and carbon dioxide heated under pressure.
Hydrosulphite	Sodium bisulphite with zinc metal, lime added, and product salted out from solution.
Nitrite	Sodium nitrate fused in iron pans and lead added at 450-500°.
Silicate	Silica, sodium carbonate and coal heated in crucible, extracted by water in autoclaves.
Sulphide	Sodium bisulphate, salt and coal heated above 950°.
	Electrolytic.
Sodium metal	Salt, in molten condition, electrolyzed.
Chlorate	Hot, concentrated, alkaline solution of salt electrolyzed.
Cyanide	From cyanamid derived from sodamid produced from metallic sodium and ammonia; made electrolytically.
Hydroxide	Solution of salt electrolyzed.
Hypochlorite	Cold dilute solution of salt electrolyzed.
Peroxide	Oxidation of metallic sodium made electrolytically.
Nitrate	Synthesis of components, electrolytically.

Many of these processes are dependent on the production of the necessary acid and of sodium carbonate, hydroxide, nitrate and sulphate or calcium salts such as the acetate, citrate, ferrocyanide, hydroxide and phosphate that are derived as by-products in other industries (wood distillation, citrus products, gas industry, lime or fertilizer industries). Other salts resulting from the use of by-products are the tartrate, from the wine industry, bisulphate and sulphate from the acid industry, arsenite and arsenate from the smelting and refining industry, and thiosulphate from the Leblanc soda process. Some are directly dependent upon natural sources other than soda salts, such being the borate, chromates, manganate, and silicate from calcium, borate, chrome ore, manganese, and sand.

Of the natural sources of sodium compounds the chloride, nitrate and borate are the most important.

Carbonates of sodium.—The four forms of carbonate of soda reached an aggregate total of $37,848,836. Bicarbonate of sodium, being the basis for all the other carbonates, was produced in much greater amounts than is indicated by the tabulation, the production being estimated at 2,691 thousand tons, and at the average price of $26 a ton would have approximated a value of $70,000,000. The amount reported was 190,894 tons and the value of portion sold was $3,695,417 produced by 10 establishments in 8 states of which 4 states—Michigan, New York, Virginia, and California—produced 99.2 per cent of the total amount. Of this a very small part resulted from refining or recovery processes and less than 5 per cent from natural brines in California. Over 95 per cent was made by the Solvay ammonia-brine process.

Similarly, about 98.5 per cent of the total amount of soda ash reported (1,507,424 tons), was produced by the Solvay process. Eighteen establishments in 12 states were concerned in the manufacture of soda ash, of which 5 states—Michigan, Ohio, New York, Virginia and Kansas—produced 90 per cent. The cost per ton varied from $24 to $40 with an average of $30.20. Grades of strength and purity were not reported.

Carbonates from natural brines in California are made by burning coke and limestone in kilns to produce CO_2 gas which is charged into the brine waters. Crystals of bicarbonate that form are separated by filters and calcined in oil burning furnaces which produce dense soda ash. By-products reported included lime which is usually employed further for the production of caustic liquor.

The production of crystalline carbonates of soda, known as sal soda, washing compounds and sesquicarbonate, increased but slightly. The alkali strengths of sal soda and soda ash bear the ratio of 21.7 to 48 (or 58) per cent Na_2O, so that instead of $27 to $30 per ton the actual cost of the crystals to the consumer was $60 to $74 a ton. The ash averaged $30. Since soda ash is sufficiently pure to be used for almost every purpose it is not surprising that the production of crystal compounds has failed to keep step with that of the calcined ash. This comparison does not include washing compounds which are of more or less unknown composition and command much higher prices.

Crystal compounds were derived from the same sources and were made by many of the same establishments as other carbonates. Thirteen establishments reported soda ash as the source of crystal soda.

Sodium hydroxide.—Twenty-nine concerns in 13 states reported the production of 333,361 tons of caustic soda. Of these, 15 establishments in Michigan, New York, and Ohio, unitedly produced nearly 89 per cent. Ten companies merely repacked and sold about 6 per cent of the total. Production by the electrolytic method from common salt was reported by 15 establishments with 28 per cent of the total.

Sodium silicate.—Twenty-one establishments in nine states produced 336,093 tons of silicate of soda, including that made and consumed in soap manufacture. Indiana, Ohio, New Jersey, Illinois, and Pennsylvania in the order named produced nearly 80 per cent of the total, two states in the far west (California, Washington), produced less than 5 per cent, four in the middle west 63 per cent, and three on the east coast 32 per cent.

Sodium sulphate.—Sulphate of sodium in its several forms reached a value of $4,838,198. Previous to 1914 niter cake was used to a limited extent only for its acid value, and the sulphate content was wasted. It now has important applications in the sulphate pulp industry and in gas recovery. Two-thirds was produced in seven Eastern states, and nearly one-third in seven Middle states, a very small fraction in the West. More than half of the niter cake was made in the production of nitric acid for the explosives industry.

Theoretically the 86,992 tons of nitric acid reported under Group I, and the additional nitric acid used for making mixed acid (about 57 per cent of 114,886 tons), required the production of 240,000 tons of niter cake, of which 67,556 tons were made and consumed, leaving about 172,000 tons as the probable production of niter cake, much of which was waste product.

Salt cake was produced in 15 states and 34 establishments, the total weight being 179,000 tons, of which 8 states—New Jersey, Illinois, Indiana, Ohio, Delaware, Pennsylvania, Massachusetts, and New York—made 89.5 per cent. An unusually large proportion of the total salt cake manufactured, 31.3 per cent, was used by manufacturers themselves in further processes of manufacture, of sodium sulphide, Glauber's salt and anhydrous sulphate.

Glauber's salt, or crystallized sodium sulphate, totaled 42,206 tons, made in 15 states by 27 establishments, 13 plants in 5 states—New Jersey, Massachusetts, Pennsylvania, Indiana, and Delaware—producing 74 per cent. Six companies produced 2,776 tons of anhydrous sodium sulphate, refined. A total of 29,818 tons of thiosulphate or "hyposulphite" was reported by 9 establishments in 7 states, 4 of which—New Jersey, Delaware, Indiana, and Pennsylvania—produced 29,799 tons, or nearly the entire amount.

Sulphides and sulphites.—Sodium sulphide was produced by 17 establishments in 11 states, and totaled 39,735 tons of all grades, or 57,000 tons when calculated to a basis of 30 per cent, or sodium sulphide crystals. About 99.4 per cent of the total was made in 8 states and nearly 80 per cent in New Jersey, Indiana, Delaware, and Massachusetts. With the exception of a small amount merely subjected to refining methods, the great bulk, or about 88.3 per cent, was made from salt cake by reduction, and 11.7 per cent by conversion from barium sulphide.

Sodium sulphite is made by saturating a solution of soda ash with sulphur dioxide to form the bisulphite, then adding more soda to form the normal salt. It also results as a by-product in the manufacture of phenol, cresol, etc. A total of 8,666 tons was made by eight firms in six states, and of this amount, 8,278 tons, or nearly 96 per cent, were made in two states—New Jersey and Maryland.

Several grades of sodium sulphite are included in the total, crystals, ground, anhydrous, dry powdered, and pure. Crystal sulphite equaled 83 per cent of the total weight.

Borax, otherwise called biborate or tetraborate of soda, amounting to 29,635 tons, was produced in eight establishments in six states, of which 27,744 tons, or 93 per cent, originated in California. Of the total amount produced 25,807 tons, or 87 per cent, was obtained from the mineral colemanite, a crude borate of calcium. The colemanite is calcined, which causes the borate portion to lose water of crystallization and form a powder easily separated from contaminating minerals by mechanical means. When boiled with sodium carbonate solution, this powder forms borax and calcium carbonate, which is removed by filtration, and the solution is concentrated to crystallization.

Borax is used in large amounts for enameling, glazing, for making borosilicate glass which has many applications, in laundry and kitchen, in tanning, dyeing and paper industries, as a flux, larvicide, antiseptic, etc.

Sodium bichromate and chromate were produced in five establishments in four states, a total of 24,081 tons, by the usual method using chrome ore, lime, soda ash, and an acid for the final neutralization of excess alkali.

Ten companies reported a total of 23,867 tons of phosphate of sodium, of which 4,321 tons were monosodium phosphate, reported by four establishments; 9,663 tons disodium salt reported by nine, and 9,883 tons trisodium salt reported by five. Several grades of purity were reported—commercial, technical dry, U. S. P. granular, and U. S. P. anhydrous. The monosodium salt shows the highest unit value. Five firms in New Jersey produced 19,006 tons, or about 80 per cent of the total.

Other sodium compounds are considered in connection with other groups—cyanides in Group II; alums in Group V; perborate, hypochlorite, bisulphite, and hydrosulphite in Group VI; and arsenate and arsenite in Group X.

Sodium compounds produced by aid of electricity.—Sodium hydroxide, cyanide, metal, chlorate, peroxide, hypochlorite, and nitrite, valued at $13,919,315 were produced by electrolytic processes. All originate from common salt, which when electrolyzed in molten condition yields metallic sodium from which is derived the cyanide and peroxide; when electrolyzed in warm aqueous solution produces the hydroxide, in cold dilute solution the hypochlorite, and in concen-

trated alkaline solution the chlorate. The nitrite is formed by synthetic processes. The amounts used by the coal-tar industry do not appear here.

Other figures are for the production of bromide, fluoride, and iodide of sodium. With "Other compounds" are included sodium hypophosphite, manganate, and silicofluoride. Of these, sodium bromide was derived from original sources, three establishments in Michigan and West Virginia mining and purifying the crude salt, and two others refining and producing the chemically pure product.

Organic sodium compounds.—The present census, in addition to sodium benzoate, has segregated the acetate and citrate and with "Other organic compounds" has included the butyrate, formate, oxalate, propionate, and sulphocarbolate, the total value of which reached $6,083,258. A comparison with the total for inorganic sodium salts would seem to show great disproportion, but in fact the chemical industry, as such, includes a very small proportion of sodium compounds of organic nature, produced in bulk, these appearing under drugs and medicinals, coal-tar chemicals, and other industries.

Five states and 11 concerns produced an aggregate of 2,260,459 pounds of acetate of soda (New Jersey, Missouri, New York, Pennsylvania, and Michigan), of which New Jersey turned out about 90 per cent.

Benzoate of soda, 120,447 pounds, was made by five establishments in three states—New York, Missouri, and Pennsylvania. This was but a small part of the total benzoate as the bulk is included under the coal-tar industry.

Three states and six establishments were concerned in the production of 118,417 pounds of sodium citrate.

Many alkali salts of organic character are formed by simple neutralization of an acid by an alkali, or by interchange of acid components between a calcium salt of the organic acid and an alkali sulphate (acetate, benzoate, butyrate, citrate, oxalate, propionate, sulphocarbolate, tartrate) so that the manufacture becomes a question closely dependent upon the derivation of the corresponding acid. Calcium acetate, a by-product of wood distillation, calcium citrate from the citrus fruit, and acid tartrate from fermentation industries, supply the original material for three organic salts. Other organic acids are made only by synthetic methods (benzoic, formic, oxalic, sulphocarbolic) or by carefully controlled bacterial action (acetic, butyric, propionic).

GROUP IV.—POTASH, POTASSIUM, AND COMPOUNDS.

Potash is a term indiscriminately used in the trade, so the special schedule designed to collect data on the production of "Potash from original sources" included the carbonate, chloride, sulphate, hydroxide, and even alum and borate, from lake brines, potash-bearing rocks, cement and blast-furnace dust and ashes of beet pulp, kelp, distillery wash and wood. All of these products were marketed as "Potash" and were used primarily as components of fertilizers, frequently irrespective of the kind of salt.

In tabulating the information the salts have been recorded as crude carbonate, chloride, and sulphate. Table 27 presents the statistics of production for potash and potassium compounds.

TABLE 27.—GROUP IV.—POTASH, POTASSIUM, AND COMPOUNDS.

	1919	1914	1909
Value of products	$18,407,253	$7,905,744	(1)
Potash from original sources: [2]			
Number of establishments	75		
Tons	109,737	(1)	(1)
Value	$7,215,164	(1)	(1)
Carbonate, crude—			
Number of establishments	44		
Pounds	48,664,478		
Value	$2,300,027	$49,651	$88,940
Chloride, crude—			
Number of establishments	24		
Pounds	144,435,589	(1)	(1)
Value	$4,169,333		
Sulphate, crude—			
Number of establishments	7		
Pounds	26,374,661	(1)	(1)
Value	$745,804		
Acetate:			
Number of establishments	6		
Pounds	69,995	(1)	(1)
Value	$47,473		
Bitartrate, (cream of tartar):			
Number of establishments	6	8	5
Pounds	4,854,550	12,646,120	15,592,937
Value	$2,620,351	$3,124,958	$2,925,883
Bromate, bromide, chlorate, chloride (refined), and iodate:			
Number of establishments	9		
Pounds	4,324,268	(1)	(1)
Value	$1,258,507		
Carbonate and bicarbonate, refined:			
Number of establishments	7		
Pounds	401,140	(1)	(1)
Value	$154,844		
Citrate:			
Number of establishments	6		
Pounds	64,088	(1)	(1)
Value	$100,754		
Hydroxide (caustic):			
Number of establishments	13		
Pounds	8,358,834	(1)	(1)
Value	$2,206,008		
Iodide:			
Number of establishments	7		
Pounds	388,678	(1)	(1)
Value	$1,298,980		
Sulphate, refined; persulphate; sulphide; bisulphite and metabisulphite:			
Number of establishments	12		
Pounds	877,178	(1)	(1)
Value	$100,751		
Unit value, pound	$0.54	$0.25	$0.19
Other potassium compounds, 1919:			
Inorganic—Bichromate and chromate, refined nitrate, permanganate, phosphate, etc.	$2,548,114	$4,731,135	(1)
Organic—Binoxalate and oxalate, and Rochelle salts	$856,307		

[1] Figures not available.
[2] Potash from original sources as reported to the Geological Survey, 1919:

SOURCE.	Number of producers.	Crude potash, quantity, net tons.	Available content of potash (K_2O).		
			Per cent of K_2O.	Quantity, net tons.	Per cent distribution.
Total	102	116,634	27.8	32,474	100.0
Mineral:					
Natural brines	17	a73,571	29.3	a21,590	66.5
Alunite	7	6,599	34.8	2,294	7.1
Dust from cement mills	14	11,665	10.8	1,258	3.8
Dust from blast furnaces, and silicate rocks	8	2,408	9.2	221	0.7
Organic:					
Beet-sugar refinery waste	11	12,423	29.0	3,601	11.1
Molasses distillery waste	6	8,791	32.9	2,892	8.9
Wood ashes	35	807	60.0	484	1.5
Kelp and miscellaneous industrial waste	4	370	36.2	134	0.4

a A considerable portion lost through accident at plant.

The reports gave the K_2O content of the brines as varying from 0.2 per cent to 2.4 per cent; wood ashes from 1.7 per cent to 5 per cent; kelp as having a K_2O content of 1.75 per cent; sugar-beet pulp, 0.32 per cent; blast-furnace flue dust, 7.5 to 9 per cent; cement dust 2.7 to 4.4 per cent; alunite, 4.5 per cent.

A summary of methods of manufacture is given:

1. The acetate, bicarbonate, binoxalate, bisulphate, bisulphite, metabisulphite, bromide, chromate, citrate, iodide, oxalate, and phosphate are made by neutralization or combination of the desired acid, its acid salt or oxide, with potassium *carbonate* or *hydroxide*,

2. The bichromate, bromate, ferrocyanide, a portion of the hydroxide, and the nitrate are formed by interchange of a compound of another base than potassium having the desired negative groups, with crude potassium *chloride*, *carbonate*, or *sulphate* usually a precipitate being formed and removed.

3. The carbonate, chloride, and sulphate not included in crude salts result by refining of the crudes.

4. The chlorate, a portion of the hydroxide, and possibly of the permanganate and persulphate, are made from the *chloride*, *sulphate*, or *hydroxide*, by electrolytic methods.

5. The ferricyanide and permanganate are made by neutralization of the corresponding acid with crude *carbonate* and subsequent oxidation with chlorine or ozone.

6. The cyanide and sulphide result from reduction of the *carbonate* (and ammonia) or of the sulphate by means of carbon at a high heat.

7. Finally, the double tartrates with sodium (Rochelle salt) and antimony (tartar emetic) result from potassium *bitartrate* by treatment with an excess of the respective cobase.

It may be noted that in the formation of all these potassium compounds there is the constant recurrence of the use of one or another of the crude potashes, either as *bitartrate*, carbonate, chloride, or sulphate.

Aside from crude potash salts for fertilizer purposes and for further manufacture, the most important products manufactured were the halogens as a group, especially the iodide, and the hydroxide. The refinement of crude carbonate as such did not reach a high figure, although seven establishments made reports. Neither did the eight establishments reporting various forms of sulphur derivatives such as alum, the refined sulphate, persulphate, sulphide, and bisulphide produce these in large amounts, the sulphites and alum covering nearly the whole. Potassium nitrate is being separated from Chile saltpeter—a natural source of nitrates, consisting mainly of sodium nitrate with a small percentage of the potassium salt—by more than one concern. Usually this salt and the bichromate are made by interchange of bases between potassium chloride and the corresponding sodium salts in water solution in which the resulting sodium chloride is more soluble, so that the potassium compound may be recovered by fractional crystallization.

Potassium hydroxide or caustic potash was produced by 13 establishments, the greater part by electrolytic decomposition of the chloride.

The *bromide*, *iodide* and *refined chloride* of potassium in order of value as named, were produced in 11 establishments, a total of 1,736,422 pounds valued at $1,909,224. The oxidized forms as *chlorate*, *bromate* and *iodate* were reported by 5 plants producing 2,976,524 pounds valued at $648,263. Electrolytic methods were employed for the latter salts, while the former group of bromide, iodide and chloride, even though refined, should rightly be considered as salts derived from original sources, bromide and chloride both originating in the salt mines of Michigan and West Virginia and the iodide produced from caustic potash and iodine which is obtained from the ash of seaweed or mother liquors of Chile saltpeter refining.

Organic salts of potassium included the *bitartrate*, *Rochelle salts*, *tartar emetic*, *citrate*, *oxalate*, etc., in the order named, the total production being valued at $3,624,885. The bitartrate was made by six companies in three states—New York, California, and Ohio—from pomace or argols. The double tartrate was derived from the same sources. Six establishments in Missouri, New York and Pennsylvania produced refined qualities of potassium acetate, at prices ranging from 45 cents to $1.05 and averaging 68 cents. There was no indication of quality, except prices.

Potassium citrate was produced only in refined grades, U. S. P., and chemically pure, six establishments reporting 64,088 pounds, value $100,754.

Potassium compounds as a whole have been restricted in growth on account of the difficulty in obtaining basic salts.

GROUP V.—ALUMS, ALUMINUM, AND COMPOUNDS.

Table 28 presents the statistics for the aluminum group. The usual separation of aluminum compounds into alums as distinct from aluminum and its other salts has been made as heretofore, except that aluminum sulphate is classed as a simple aluminum salt and not as alum. For convenience of comparison, and owing to the similarity of their applications, iron and chrome alum are included in the subgroup "Alums," although they contain no aluminum.

Practically all aluminum salts find applications as mordants, paper sizes, and dye-lake bases. Chrome alum, however, is especially adapted to chrome tanning, and aluminum sulphate to white tanning of leather; aluminum acetate to water proofing and as an embalming fluid; aluminum chloride for use in petroleum refining and as a catalytic agent in organic syntheses; and ammonium alum for medicinal pur-

poses. For water purification, aluminum sulphate and soda alum are mainly used.

TABLE 28.—GROUP V.—ALUMS, ALUMINUM, AND COMPOUNDS.

	1919	1914	1909
Value of products	$43,433,482	(1)	(1)
Alums	$17,055,891	$3,467,969	$3,022,355
Ammonium alum—			
Number of establishments	8		
Total production, tons	3,949		
For sale—			
Tons	3,797	(1)	(1)
Value	$304,018		
Made and consumed, tons	152		
Potash alum—			
Number of establishments	4	5	
Tons	393	6,382	5,127
Value	$65,745	$219,968	$155,319
Unit value, ton	$167	$34	$30
Sulphate (concentrated alum)—			
Number of establishments	19	11	
Total production, tons	312,872		
For sale—			
Tons	312,759	92,500	77,737
Value	$15,665,526	$1,728,566	$1,312,751
Unit value, ton	$50	$19	$17
Made and consumed, tons	113		
Other alums—[2]			
Number of establishments	12		
Total production, tons	15,337		
For sale—			
Tons	15,322	57,973	55,283
Value	$1,020,602	$1,519,435	$1,554,285
Unit value, ton	$67	$26	$28
Made and consumed, tons	15		
Aluminous abrasives:			
Number of establishments	3		
Tons	11,306	(1)	(1)
Value	$2,032,588		
Aluminum chloride:			
Number of establishments	7		
Total production, tons	4,411	(1)	(1)
For sale—			
Tons	4,265		
Value	$362,445		
Made and consumed, tons	146		
Aluminum hydroxide and oxide, refined:			
Number of establishments	5		
Total production, tons	6,375		
For sale—			
Tons	3,847	(1)	(1)
Value	$514,649		
Made and consumed, tons	2,528		
All other—Aluminum and alloys, aluminum nitrate, calcined bauxite, refined cryolite, etc., value	$23,467,909	(1)	(1)

[1] Figures not available.
[2] 1919—Burnt, chrome and soda alums; 1914—Burnt and soda alums, porous, excelsior and pearl, ammonium, alum cake, etc.

Simple salts of aluminum, such as the sulphate, chloride, hydrate, and sodium aluminate, being stronger in the essential ingredient per unit of weight and also cheaper, have almost replaced alums.

In no other group are so many products derived primarily from one raw material. With few exceptions, all originate in the mineral bauxite, a natural hydrate or hydrous oxide containing from 30 to 60 per cent Al_2O_3. Arkansas leads in its production. From it directly or indirectly, are derived the metal, the acetate, chloride, fluoride, hydroxide, oxide and sulphate, calcium and sodium aluminates, and ammonium, burnt and sodium alums, or 93 per cent of all aluminum products.

Among other sources of aluminum compounds we find alunite, a hydrous sulphate of aluminum and potassium, mined principally in Utah, which has been developed since 1914 mainly as a source of potassium sulphate, aluminum compounds appearing as a by-product. Potash alum is derived only in part from alunite.

Clay, a hydrous silicate of aluminum, is the source of aluminous abrasives and alum cake (for which no figures were reported in 1919). Especially pure clay, or kaolin, is sometimes used instead of bauxite.

The following scheme, giving in brief detail the methods of manufacture, illustrates the relative dependency of aluminum compounds upon bauxite, alunite, or clay as a material:

MATERIAL.	Product.
Bauxite:	
Calcined, leached, and solution treated with CO_2 or air	Hydrate.
Hydrate, calcined	Oxide.
Oxide electrolyzed	Metal.
Oxide or clay electrothermolyzed	Abrasives.
Hydrate with acetic, hydrochloric, hydrofluoric, nitric, or sulphuric acids.	Salts-Acetate, chloride, fluoride, nitrate, sulphate.
Sulphate and alkali sulphate	Alums.
Alum calcined	Burnt alum.
Hydrate or ore calcined with soda ash or lime	Sodium or calcium aluminates.
Alunite:	
Roasted, leached, crystallized	Potash alum.
Clay:	
Electrothermolyzed	Abrasives.
Ferrous and ammonium sulphate solutions mixed and double salt crystallized.	Iron alum.
Alkali bichromate in dilute sulphuric acid reduced with sulphurous acid.	Chrome alum.

Aluminum hydroxide, or refined bauxite, and the oxide derived by calcination, were made in large quantities and consumed in the further manufacture of the metal and its salts, but the figures are not available. Amounts reported as sold form but a small part of the total production.

Aluminum sulphate consists of from 50 per cent to nearly 100 per cent aluminum sulphate, according to its state of hydration. Alums contain from 34 to 38 per cent or less of aluminum sulphate. All establishments with one exception gave bauxite and sulphuric acid as raw materials. Calculated as crystallized salt containing 50 per cent aluminum sulphate, the 312,872 tons reported in 1919 required about 160,000 tons of 30 per cent bauxite ore. For the 6,375 tons of alumina and hydroxide reported, an additional 21,250 tons were required. The total bauxite required for the three items of aluminum metal, its oxide or hydroxide, and sulphate, irrespective of other compounds, would be 560,000 tons of 30 per cent ore.

The manufacture of *aluminum chloride* differs from the usual union of an hydroxide or oxide with an acid in solution in water, in that chlorine or hydrochloric acid is allowed to react upon the metal itself, the carbide, or a mixture of the oxide and carbon, all heated to high temperature. Of the other compounds of aluminum, refined cryolite and bauxite are of most importance, only small amounts of acetate, nitrate, and sodium aluminate being produced.

The figures for alums in 1914 included several salts of aluminum which in the present census are to be found in the subgroup "Aluminum and its compounds, other than alum." To this extent comparisons of the two groups are not correct.

GROUP VI.—BLEACHING COMPOUNDS.

Bleaching compounds are of three principal kinds, and may be classified as chlorine, peroxide, and sulphur bleaches. Chlorine and peroxide bleaches are similar in that they are oxidizing agents and decompose the impurities by the addition of oxygen or removal of hydrogen to form water, while sulphur-bleaches abstract oxygen or act as reducing agents. The latter effect is not so stable, the tendency being for the bleached material to take up oxygen from the air and, in part at least, regain its former state.

All bleaches act in presence of water. Chlorine and hypochlorites (by virtue of the chlorine set free by acids) attack the water, freeing oxygen, the active agent, in the nascent or extremely reactive state. Peroxides in themselves are very unstable, readily giving up oxygen, also in the nascent condition. Sulphur dioxide, either as such or liberated from bisulphites and sulphites by acids, is the active agent in all sulphur bleaches. It removes oxygen from the more unstable impurities forming sulphuric acid with the water present.

TABLE 29.—GROUP VI.—BLEACHING COMPOUNDS.

	1919	1914	1909
Value of products	$12,392,806	$5,302,359	$3,215,728
Chlorine bleaches:			
Chlorine—			
Number of establishments [1]	14	7	.....
Total production, pounds	91,141,000	.....	.....
For sale—			
Pounds	34,392,000	12,217,000	(2)
Value	$1,425,017	$472,836	.....
Unit value, 100 pounds	$4.15	$3.87	.....
Made and consumed, pounds	56,749,000	.....	.....
Hypochlorites (calcium and sodium)—			
Number of establishments [1]	16	14	9
Pounds	252,850,000	310,380,000	116,802,000
Value	$4,781,350	$2,916,225	$1,786,846
Unit value, 100 pounds	$1.89	$0.94	$1.53
Peroxide bleaches:			
Barium peroxide—			
Number of establishments [1]	3	.....	.....
Pounds	3,134,000	(2)	(2)
Value	$569,483	.....	.....
Hydrogen peroxide—			
Number of establishments [1]	11	20	17
Pounds	31,515,000	32,595,000	9,926,000
Value	32,257,282	$1,303,596	$870,541
Other peroxide bleaches	$612,045	(2)	(2)
Sulphur bleaches:			
Bisulphite of calcium, soda, potassium, etc.—			
Number of establishments [1]	14	14	15
Pounds	39,225,000	26,346,000	31,718,000
Value	$961,284	$243,559	$226,154
Unit value, 100 pounds	$2.49	$0.92	$0.71
Sulphur dioxide—			
Number of establishments [1]	3	.....	.....
Pounds	856,000	.....	.....
Value	$99,896		
Other sulphur bleaches, value	$1,073,464	$366,143	$332,187
Other bleaching compounds, not specified, value	$612,085		

[1] States and number of establishments in order of production, 1919:
Chlorine (14): New Hampshire, 1; New York, 5; Michigan, 3; Maine, 1; Pennsylvania, 1; West Virginia, 2; and Missouri, 1.
Hypochlorites (16): New York, 5; Michigan, 2; California, 2; Virginia, 1; Rhode Island, 2; Pennsylvania, 2; Maryland, 1; and West Virginia, 1.
Barium peroxide (3): Ohio, 1; New York, 1; and West Virginia, 1.
Hydrogen peroxide (11): New York, 4; New Jersey, 2; Missouri, 2; Illinois, 1; Ohio, 1; and California, 1.
Bisulphites (14): Massachusetts, 3; Delaware, 1; New Jersey, 2; New York, 2; Maryland, 1; Pennsylvania, 1; Missouri, 3; and California, 1.
Sulphur dioxide (3): New Jersey, 1; Wisconsin, 1; and Virginia, 1.
[2] Figures not available.

While in amounts produced the order is chlorine, peroxide, and sulphur bleaches, in ratio of increase the order is reversed. Hypochlorites and hydrogen peroxide have decreased in tonnage, liquid chlorine apparently having displaced both. The electrolytic production of sodium and potassium hydroxides, developed as a result of the necessities of war, required an outlet for excess chlorine, with consequent reduction in price below other bleaches. Liquid chlorine was practically the same price in 1919 as in 1914.

Chlorine bleaches were produced by electrolytic decomposition of common salt, the resultant gas being compressed and cooled to a liquid and marketed in steel cylinders, or conducted into caustic lime or soda to form "Chloride of lime" or soda; that is, hypochlorites of calcium and sodium.

Liquid chlorine within five years increased from 6,000 tons to more than 17,000 tons, marketed, and in addition in 1919, 28,000 tons were used in the producing plants for further manufacture of chlorine products such as chloracetic acid, sulphur chlorides, carbon tetrachloride, chloroform, hydrochloric acid, tin salts, and other metallic chlorides, exclusive of that used for the production of bleaching powder.

Fourteen establishments in seven states—New Hampshire, New York, Michigan, Maine, Pennsylvania, West Virginia, and Missouri—manufactured liquid chlorine. Since it is a by-product of that portion of the caustic soda and caustic potash industries employing electrolysis, and must have been produced in equi-molecular amounts, the actual production must have been 85,212 tons. That is, more than 85,000 tons of chlorine were made, and since 45,000 tons were reported and either used directly as a bleaching agent or for the manufacture of the various chlorine compounds enumerated above, there remains about 40,000 tons which must have been consumed in the manufacture of bleaching powders or lost.

Hypochlorites included but 2,400 tons of sodium salt. The total production of calcium and sodium hypochlorites amounted to 126,425 tons, made by 16 concerns in 8 states, New York and Michigan producing 82 per cent of the whole. At an average of 30 to 35 per cent chlorine, this weight of bleaching powder required from 38,000 to 45,000 tons of chlorine for its manufacture, which agrees fairly well with the above estimate based on the caustic produced.

Peroxide bleaches, second in importance, gained in favor for special applications and in spite of competition with the cheaper chlorine and its derivatives. Eleven plants in six states—New York, New Jersey, Missouri, Illinois, Ohio, and California—made hydrogen peroxide, 77.6 per cent of the total amount being attributable to six establishments in the first two states.

Barium peroxide, while not the most important of the peroxide bleaches when the amount sold is considered, is in fact the primary compound from which hydrogen peroxide is derived. Approximately 80,000 tons of barium peroxide were required to produce the hydrogen peroxide reported.

A considerable amount of sodium perborate was made and the value is included among other peroxide bleaches as the action is due to the liberation of hydrogen peroxide or nascent oxygen.

Among *sulphur bleaches* bisulphite of sodium (including a small amount of the calcium salt), was the most important product, for although sulphur dioxide is the active ingredient the sodium compound, being a dry powder, is a more convenient method of transporting it.

Five states—Delaware, Massachusetts, New Jersey, New York, and Maryland—produced 98.8 per cent of the total. As in the case of sulphites, bisulphite of soda was reported in a number of grades, as solution, liquid 38°, anhydrous, metabisulphite, dry, and dry powdered. Low-grade material totaled 11,377 tons and ranged in price from $20 to $40 per ton, while the higher grades ranged from $67 per ton upward, according to purity and strength, and averaged $72 per ton.

A notable amount of formaldehyde hydrosulphite bleaching compound was made and is included in the value of other sulphur bleaches. Prior to 1914 this was imported.

GROUP VII.—COAL-TAR CHEMICALS.

This branch of the industry includes establishments distilling tars for the production of crudes, those synthesizing intermediates from crudes and those building up from these intermediates a variety of finished products. Coal-tar intermediates may be fashioned into dyes or dye-lakes, photographic chemicals, medicinals, perfumes, flavors, synthetic tanning materials, synthetic phenolic resins, and other synthetics. The general statistics for this branch of the chemical industry are presented as a separate section of this report on chemicals and allied products entitled "Coal-tar products." Table 30 presents the statistics for products, by groups.[1]

Coal or oil when dry distilled yields volatile combustible compounds and a solid residue. Part of the volatile portion is utilized in the gas industry, and the residual coke by the metallurgical industries, distillation being so regulated that in the one case the largest possible proportion of volatile matter results, while the other aims to produce the greatest amount of solid residue.

An average distribution of the three main distillation products from coal is shown to be 16 per cent gas, 19 per cent vapors including 2 per cent water, and 65 per cent coke. Gas and coke are used without material change. The vapors are condensed by cooling or recovered in solvents and are usually retreated for a partial separation of individual components. Aside from about 2 per cent ammoniacal water the liquefied compounds are primarily tar and light oils. Either or both may be redistilled or sold as such. A large part of the oils and some tar are in fact fractionated in the establishment where produced, so that the by-products of the gas and coke industries are not the original crude tar and light oils but are the several fractions resulting from further distillations and separations, such as crude benzol, toluol, xylol, phenols, cresols, carbazol, pyridine, naphthalene, solvent naphtha, dead or creosote oil, anthracene oil, pitch, refined or prepared tar and sometimes tar-coke.

[1] See report of United States Tariff Commission, Census of dyes and coal-tar chemicals, 1919, for detailed statistics of production.

TABLE 30.—GROUP VII.—COAL-TAR CHEMICALS.

	1919	1914	1909
Total value	$133,499,742	$13,492,453	$7,969,672
Crudes:			
Number of establishments	56	40	42
Value	$21,148,814		
Intermediates:			
Number of establishments	100	[1]$8,065,156	[1] $4,057,591
Pounds	117,470,001		
Value	$28,250,517		
Dyes and color lakes:			
Number of establishments	106	[2]12,169,635	[2] 12,658,770
Pounds	65,909,250	$4,652,947	$3,683,553
Value	$69,318,785		
Photographic chemicals:			
Number of establishments	11		
Pounds	384,181		
Value	$1,189,995		
Medicinals:			
Number of establishments	25		
Pounds	5,724,245		
Value	$8,679,277		
Flavors and perfumes:		[3] $774,350	[3] $228,528
Number of establishments	13		
Pounds	861,143		
Value	$2,643,698		
Synthetic phenolic resins:			
Number of establishments	6		
Pounds	3,696,757		
Value	$2,268,656		

DISTRIBUTION OF NUMBER OF ESTABLISHMENTS, BY STATES.

	Crudes.	Intermediates.	Dyes and color lakes.	Photographic chemicals.	Medicinals.	Flavors and perfumes.	Synthetic phenolic resins.
United States	56	99	106	11	25	14	6
NEW ENGLAND:							
Massachusetts	3	5	7				
Rhode Island		1	1				
Connecticut	1	2					
MIDDLE ATLANTIC:							
New York	4	21	33	5	9	3	
New Jersey	3	40	29	3	7	7	4
Pennsylvania	10	9	8	1	2		1
EAST NORTH CENTRAL:							
Ohio	9	6	5		1		
Indiana	1	1					
Illinois	6	5	7	1	2	2	1
Michigan	1	2	2		1		
Wisconsin	2	1	4		1		
WEST NORTH CENTRAL:							
Minnesota	3						
Missouri	3	1	2		1	1	
SOUTH ATLANTIC:							
Maryland			1		1		
District of Columbia	1						
Virginia		1	2			1	
West Virginia	1	2	2				
Georgia			1				
EAST SOUTH CENTRAL:							
Tennessee	1	1	1				
Alabama	2						
Louisiana	1						
MOUNTAIN AND PACIFIC:							
Utah	1						
Washington	3						
California		1	1	1			

[1] Reported as "Coal-tar distillery products."
[2] Coal-tar dyes and intermediates made largely from stock of foreign origin.
[3] Reported as "Chemicals or medicinal preparations from coal tar."

Much crude tar, especially of the gas industry, is purchased by distillers who make a specialty of the fractionation of light oils and tar. These distillers, who do not properly form part of either the gas or the coke industry, are included for census purposes with the coal-tar chemical industry, under the group "Crudes." Products of the distillation of tar by these special distillers are the same but differ in relative quantities of ingredients separated by treatment of tar and oils in the original establishments. Basic materials for coal-tar chemicals are derived therefore from two sources, (1) from the gas and coke industries where light oils and some tar are worked up as by-products, and (2) from tar distillers within the industry proper. Tar as such and much of the heavier fractions from various distillations are used for many purposes, as fuel, insecticides, wood preservatives, and roofing materials, only a small part of the total bulk of material being employed for the synthesis of coal-tar compounds.

Upon redistillation tar leaves a semisolid carbonaceous residue of "pitch," almost equal in percentage weight to the proportion of coke in the original coal. Water vapor amounts to about 4 per cent, heavy oils to 20 per cent, and loss as gas about 1 per cent, leaving approximately 13 per cent of the distillate which may be available for coal-tar syntheses. This distillate consists of benzol and its homologs, 2.5 per cent; phenol and homologs, 2 per cent; pyridine and quinoline, 0.25 per cent; naphthalene and acenaphthene, 6 per cent; and anthracene and phenanthrene, 2 per cent.

Coal therefore upon distillation yields 17 per cent light oils and tar, in about the proportion of 1 to 4, and when the tar is redistilled it yields nearly 13 per cent material that may in part be used for organic syntheses, to the extent of 1. 5 per cent of the original coal.

In the same way the light oils are fractionated into a number of distillates, all of which separations are extremely variable, and repeated fractionations are required to isolate the individual chemicals required as "crudes" for synthesis of coal-tar intermediates.

The coal-tar chemical group includes crudes, intermediates and finished compounds.

Commercially it is customary to apply the term "crudes," to the basic hydrocarbons, with slight regard to their condition of purity. Benzols, toluols, xylols, naphthalenes in the unrefined states as well as benzene, toluene, and other refined products are spoken of as crudes. A crude remains a crude until chemical change has been brought about, only an alteration in composition denoting the change from crude to intermediate.

For census and tariff purposes, however, a distinction is made between grades of naphthalene and of anthracene, more refined grades being taken out of the class of crudes and included with intermediates. So also the phenols, cresols, and other tar acids of defined strengths produced by distillation of tar, which by general usage are classed with crudes, are put for tariff reasons with synthetic phenol as intermediates, whether of technical or pure quality.

The statistics concerning products were collected on a joint schedule in cooperation with the United States Tariff Commission, the Bureau of the Census section being confined to group totals for production. The values as reported by the census and those by the Tariff Commission necessarily will not agree since the latter include intermediates reported to have been made and consumed in the same works, while the census figures are confined to the marketed products of the establishments, or products in form and condition to be marketed. Table 30 covers establishments making coal-tar derivatives only, while the totals in the text which follows also include contributing industries where coal-tar chemicals were of secondary importance.

Crudes.—The materials used for the production of coal-tar "crudes" were distributed as follows:

Coal tar	barrels (50 gals.)	3,478,884
Oil tar	barrels (50 gals.)	669,561
Gas-house tar	barrels (50 gals.)	104,175
		4,252,620
Other organic materials:		
Liquids	barrels (50 gals.)	148,110
Solids	tons (2,000 lbs.)	72,000

The liquids under "Other organic materials" included solvent naphtha, benzol, toluol, cresols, creosote oil, drip and holder oil, gasoline and other distillates, while the solids consisted of phenol, naphthalene, pitch, and coal. Converting all of these to a weight basis makes a total of over 1,000,000 tons of material.

From this amount of material a total of 926,000 tons of distillates and residues was obtained with a value of $22,000,000, and together with tarred felt, roofing, and other products the total value of products from 60 establishments distilling crude tar and related coal-tar distillates was $33,000,000. If with this is combined the value of similar distillates in the gas and coke industries the total value reached over $70,000,000.

The distribution of these products was not made in census reports. If the figures reported from the gas and coke schedules are combined with those in the report of the Tariff Commission for the various distillates we find:

	Gallons.	Value.
Liquid distillates:		
Tar	338,507,667	$11,579,801
Light oil	93,304,718	10,608,880
Benzene	68,152,464	12,697,474
Toluene	2,034,542	687,181
Solvent naptha	4,079,025	675,359
Other refined oils	54,146,434	6,668,862
Total	560,224,850	$42,917,557
	Pounds.	
Solid distillates:		
Naphthalene	38,372,647	$1,731,806
Anthracene	1,381,944	238,977
Other distillates	1,309,927,746	10,907,617
Total	1,349,682,337	$12,878,400
Grand total, value		$55,795,957

Intermediates.—In the absence of detailed statistics for intermediates only totals can be given, namely, that 112 establishments in the coal-tar and related industries produced 137,763,929 pounds, with a value of $43,788,510.

Finished products.—One hundred and seventy-six establishments in the coal-tar and related industries made finished products which were distributed as follows:

	Pounds.	Value.
Dyes	81,497,833	$75,534,445
Medicinals	10,227,427	16,893 951
Flavors	1,682,875	5,120,299
Synthetic resins	3,696,757	2,268,656
Photo chemicals	463,527	1,278,764
Perfumes	63,720	313,318
Total value		$101,409,433

GROUP VIII.—PLASTICS.

Table 31 presents the statistics for plastics, 1919 and 1914.

TABLE 31.—GROUP VIII.—PLASTICS:[1] 1919 AND 1914.

	1919	1914
Number of establishments	[2] 35	24
Value of products	[3] $77,477,041	$13,895,784
In form for further manufacture (rods, sheets, blocks, etc.):		
Pyroxylin (including products sold under trade names)—		
Number of establishments	[2] 4	.....
Total production, pounds	20,752,950	.....
For sale—		
Pounds	16,743,064	.....
Value	$20,855,988	$3,778,374
Made and consumed, pounds	4,009,886	.....
Collodion and liquid solutions of pyroxylin—		
Number of establishments	[2] 10	.....
Total production, pounds	19,343,463	.....
For sale—		
Pounds	17,171,313	.....
Value	$3,810,187	(4)
Made and consumed, pounds	2,172,150	.....
Rubber substitutes—		
Number of establishments	[2] 11	.....
Total production, pounds	7,755,476	.....
For sale—		
Pounds	7,291,776	
Value	$1,309,644	
Made and consumed, pounds	463,700	$5,526,740
Finished articles of pyroxylin and rubber substitutes (made in the producing establishment) and nitrocellulose, value	$9,870,395	
Other plastics, viscose, etc., including artificial silk, value	$41,630,827	$4,590,670

[1] Production in 1909. Number of establishments, 24; value of products, $7,472,732.
[2] Distribution by states:
All establishments, 35; New Jersey, 10; Massachusetts, 9; New York, 5; 2 each in Illinois, Connecticut, Ohio, and Pennsylvania; and 1 each in Missouri, Maryland, and Virginia.
Pyroxylin, 4. New Jersey, 2; and Massachusetts, 2.
Collodion, 10. New Jersey, 5; and 1 each in Connecticut, Illinois, Missouri, New York, and Pennsylvania.
Rubber substitutes, 11. Massachusetts, 4; New Jersey, 2; New York, 2; and 1 each in Connecticut, Illinois, and Maryland.
[3] Not including establishments engaged primarily in the manufacture of motion-picture films (not exposed), viz: 18 establishments in 1919, with products valued at $72,152,797.
[4] Figures not available.

This group embraces the pyroxylin plastics sold under such trade names as celluloid, fiberloid, xylonite, etc., and fabrications thereof; pyroxylin or soluble cotton, collodion, and liquid solutions of pyroxylin; phenolic condensation plastics, such as bakelite and condensite; rubber substitutes; viscose, artificial silk; and plastics formed by using a cementing material, caoutchouc, casein, gums, etc., and a filler, which may be molded or shaped. The total value includes the value of finished goods manufactured in the producing establishments, as well as the value of stock sold for further manufacture.

Artificial silk ranked first in value, with viscose as the predominating basic material for its manufacture. Cellulose acetate silk is a growing product. Only three companies reported artificial silk manufacture in 1919.

Pyroxylin plastics constituted 45 per cent of the total value of the group. Collodion, or liquid solution of pyroxylin, was made in 10 establishments; dry nitrocellulose in 4. Rubber substitutes have kept pace with other plastics in growth.

GROUP IX.—COMPRESSED AND LIQUEFIED GASES.

Table 32 presents the statistics for compressed and liquefied gases. Certain gases, anhydrous ammonia, carbon dioxide, and chlorine, are primarily classed in other groups, where the detailed statistics will be found.

TABLE 32.—GROUP IX.—COMPRESSED AND LIQUEFIED GASES.

[Cubic feet at atmospheric pressure.]

	1919	1914	1909
Value of products	$43,263,918	$10,415,325	(1)
Acetylene:[2]			
Number of establishments	49	40	.....
Total production, cubic feet	313,558,000	.....	.....
For sale—			
Cubic feet	311,390,000	121,696,000	(1)
Value	$7,140,757	$2,317,005	.....
Average value per 100 cubic feet	$2.29	$1.90	.....
Made and consumed, cubic feet	2,168,000	.....	.....
Ammonia, Anhydrous (see Group II)	$7,224,473	$3,140,848	$2,544,238
Carbon dioxide (see Group I)	$6,574,250	$2,320,085	$2,345,743
Chlorine (see Group VI)	$1,425,917	$472,836	.....
Hydrogen:			
Number of establishments	[3] 40	6	.....
Total production, cubic feet	138,177,000	.....	.....
For sale—			
Cubic feet	137,082,000	1,669,000	(1)
Value	$851,397	$16,671	.....
Average value per 100 cubic feet	$0.62	$1.00	.....
Made and consumed, cubic feet	1,095,000	.....	.....
Nitrogen:			
Number of establishments	8	.....	.....
Cubic feet	2,162,000	(1)	(1)
Value	$45,416	.....	.....
Nitrous oxide (laughing gas):			
Number of establishments	8	7	5
Gallons[4]	25,740,000	17,838,000	[5] 97,175
Value	$515,164	$213,099	$38,589
Average value per 100 gallons	$2.00	$1.19	$3.96
Oxygen:			
Number of establishments	94	51	20
Electrolytic	39	.....	.....
Other	55	.....	.....
Cubic feet	1,173,414,000	104,714,000	3,814,000
Electrolytic	131,477,000	.....	.....
Other	1,041,937,000	.....	.....
Value	$16,577,389	$1,829,446	$177,469
Average value per 100 cubic feet	$1.41	$1.75	$4.65
Other gases—(1) sulphur trioxide; (2) blau gas, oil, and carbohydrogen; (3) argon; (4) sulphur dioxide; and (5) carbon monoxide; named in order of value	$2,909,155	$104,135	$59,756

[1] Figures not available.
[2] Not including acetylene distributed through mains by public service companies: 1919, 37 establishments, 5,077,000 cubic feet, value $39,647; and 1914, 125 establishments, 14,868,000 cubic feet, $194,019.
[3] Distribution by states, Ohio, 4; Pennsylvania, 4; Michigan, 3; Missouri, 3; 2 each in California, Indiana, New Jersey, New York, Oklahoma, and Utah; and 1 each in Arkansas, Colorado, Connecticut, Illinois, Iowa, Kentucky, Louisiana, Massachusetts, Nebraska, Oregon, Texas, Utah, Virginia, and Wisconsin.
[4] Equivalents in cubic feet; 1919, 3,432,000; 1914, 2,378,400.
[5] Quantity reported in pounds.

Hydrogen employed for the hydrogenation of oils, generated *in situ* in the nascent condition and immediately absorbed, was not measured nor reported. Argon finds employment as a filler for electric incandescent lamps and the demand has increased greatly within the last five years in consonance with the growth of the primary industry. Its employment commercially is only recent and a direct result of the demand for oxygen, with consequent refinement of the methods for the fractionation of liquid air. Five establishments in four states reported production.

Liquid air must have been prepared in very large quantities to supply the requirements for argon, nitrogen, and oxygen. Twenty-three states and 49 establishments produced acetylene; 29 states and 94 plants, oxygen; and 25 states and 40 plants hydrogen, made electrolytically from water.

GROUP X.—CHEMICALS NOT ELSEWHERE SPECIFIED.

The group carries the two major subdivisions, organic and inorganic. Distinction should be made between the purely organic and inorganic compounds, and the composites, such as the salts of metals with organic acids. Much depends upon which is the valuable constituent. As a rule compounds containing both organic and inorganic constituents have been classed as organic.

Table 33 presents the statistics of production for 1919, 1914, and 1909.

TABLE 33.—GROUP X.—CHEMICALS, NOT ELSEWHERE SPECIFIED.

	1919	1914	1909
Value of products	$156,672,155	$52,898,172	$48,851,270
ORGANIC	$72,141,542	$16,377,955	$14,039,748
Alcohols:[1]			
Amyl alcohol—			
Number of establishments	5		
Total production, gallons	241,254		
For sale—			
Gallons	141,535	(2)	(2)
Value	$497,906		
Made and consumed, gallons	99,719		
Glycerin (glycerol)—			
Crude—			
Number of establishments	91		
For sale—			
Pounds	21,402,735	16,568,920	
Value	$2,961,583	$2,278,976	
Unit value, pound	$0.14	$0.14	
Made and consumed in soap industry, pounds	38,350,994		
Refined—			
Number of establishments	31		79,677,490
Total production, pounds	69,464,298	60,944,799	$11,752,580
For sale—			
Pounds	67,342,822	59,810,405	
Value	$20,724,033	$10,779,204	
Unit value, pound	$0.31	$0.18	
Made and consumed, pounds	2,121,476	1,134,394	
Other—butyl, diacetone, limone, and propyl alcohols; dextro citronellol, geraniol, guaiacol, iso-eugenol, linalool, nerol, resorcinol, rhodinol, terpineol, some ethyl alcohol ($126,299), and methyl alcohol ($5,763) produced in chemical establishments, value	$553,234	(2)	(2)
Aldehydes:			
Formaldehyde—			
Number of establishments	6	3	3
Total production, pounds	25,006,815		
For sale—			
Pounds	19,663,753	8,426,247	3,794,486
Value	$3,938,322	$655,174	$363,717
Unit value, pound	$0.20	$0.08	$0.10
Made and consumed, pounds	5,343,062		

[1] Not including (except as noted under "Other alcohols") ethyl or grain alcohol, the product of distilleries; nor methyl or wood alcohol, for which see "Wood distillation."
[2] Figures not available; included with unclassified.

TABLE 33.—GROUP X.—CHEMICALS, NOT ELSEWHERE SPECIFIED—Continued.

	1919	1914	1909
Aldehydes—Continued.			
Vanillin—			
Number of establishments	4		
Pounds	134,687	120,019	(1)
Value	$1,365,941	$525,219	
Unit value, pound	$10.14	$4.35	
Other, including acetic, anisic, citral, and decyl aldehydes; chloral hydrate; formaldehyde; hydrosulphite; heliotropin; and miscellaneous	$1,794,268	(1)	(1)
Carbon and hydrocarbon compounds:			
Carbon bisulphide—			
Number of establishments	8		
Total production, pounds	15,469,567		
For sale—			
Pounds	11,606,193	(1)	(1)
Value	$640,346		
Made and consumed, pounds	3,863,374		
Other—acetylene, blau gas, oil gas, calcium carbide, silicon carbide, thymene, etc	$28,362,198		
Esters:			
Amyl acetate—			
Number of establishments	8		
Total production, gallons	125,725		
For sale—			
Gallons	96,143	180,237	238,774
Value	$350,573	$465,664	$442,771
Unit value, gallon	$3.65	$2.58	$1.85
Made and consumed, gallons	29,582		
Ethyl acetate—			
Number of establishments	7		
Total production, pounds	5,780,549		
For sale—			
Pounds	2,657,947	(1)	(1)
Value	$340,011		
Made and consumed, pounds	3,122,602		
Other—amyl and ethyl butyrate, amyl valerate, butyl acetate, ethyl formate, etc	$1,007,794	(1)	(1)
Ethers:			
Ethyl ether (sulphuric ether)—			
Number of establishments	10		
Total production, pounds	4,875,255		
For sale—			
Pounds	4,111,755	2,120,082	1,168,631
Value	$1,103,676	$278,816	$190,164
Unit value, pound	$0.27	$0.13	$0.16
Made and consumed, pounds	763,500		
Ethyl nitrite (nitrous ether)—			
Number of establishments	5		
Pounds	43,153	(1)	(1)
Value	$30,856		
Other—methyl ether, etc	$22,570	(1)	(1)
Halogen compounds:			
Carbon tetrachloride—			
Number of establishments	5		
Total production, pounds	11,908,704		
For sale—			
Pounds	9,811,779	(1)	(1)
Value	$803,648		
Made and consumed, pounds	2,096,925		
Chloroform—			
Number of establishments	6		
Pounds	1,677,641	1,333,954	1,869,685
Value	$516,625	$295,317	$477,538
Unit value, pound	$0.31	$0.22	$0.26
Ethyl chloride—			
Number of establishments	6		
Pounds	248,103	(1)	(1)
Value	$166,235		
Other—chlor acetyl and ethylene chloride, ethyl bromide, ethyl iodide, iodoform, monobrom benzene, monobrom camphor, tetrachlorethane, and thymol iodide	$254,248	(1)	(1)
Ketones:			
Acetone—			
Number of establishments	4	8	
Pounds	6,045,914	10,425,817	7,761,696
Value	$767,042	$1,099,585	$812,978
Unit value, pound	$0.13	$0.11	$0.10
Acetone oil—			
Number of establishments	3		
Gallons	99,692	(1)	(1)
Value	$127,831		
Methyl ethyl ketone (methyl acetone)—			
Number of establishments	6		
Pounds	1,158,032	(1)	(1)
Value	$167,734		
Other—violet ketone and miscellaneous	$97,351	(1)	(1)
Other specified organic chemicals—amines, various coal-tar products, alcogas, refined camphor, oleo resin, ossein, thymol, and sulphonal	$1,409,158	(1)	(1)
Other unclassified organic chemicals	$4,138,359	(1)	(1)
INORGANIC	$84,530,613	$36,520,217	$34,811,522
Antimony:			
Chloride—			
Number of establishments	4		
Pounds	103,466	(1)	(1)
Value	$15,554		

[1] Figures not available; included with unclassified.

TABLE 33.—GROUP X.—CHEMICALS, NOT ELSEWHERE SPECIFIED—Continued.

	1919	1914	1909
Antimony—Continued.			
Sulphide—			
Number of establishments	5		
Pounds	2,983,378	(1)	(1)
Value	$808,433		
Other—oxide, oxychloride, potassium, antimonyl tartrate	$366,040	(1)	(1)
Arsenic:			
Arsenate of calcium—			
Number of establishments	5		
Pounds	1,191,868	(1)	(1)
Value	$248,459		
Arsenate of lead—			
Number of establishments	12	11	
Total production, pounds	11,514,275	8,847,656	.....
For sale—			
Pounds	11,465,788	8,641,856	(1)
Value	$2,090,341	$511,688	.....
Unit value, pound	$0.18	$0.06	.....
Made and consumed, pounds	48,487	205,800	.....
Other—arsenous and arsenic acid, arsenical salts of copper, magnesium, sodium and zinc, etc., some metal, and sulphide	$1,150,567	$134,294	(1)
Barium:			
Carbonate—			
Number of establishments	4		
Pounds	12,906,705	(1)	(1)
Value	$359,465		
Chloride—			
Number of establishments	9		
Total production, pounds	8,743,098		
For sale—			
Pounds	5,811,579	(1)	(1)
Value	$229,544		
Made and consumed, pounds	2,931,519		
Nitrate—			
Number of establishments	4		
Total production	2,025,185		
For sale—			
Pounds	903,377	(1)	(1)
Value	$35,319		
Made and consumed, pounds	1,121,808		
Sulphate (blanc fixe)—			
Number of establishments	10	11	.....
Pounds	13,635,789	18,278,000	8,152,000
Value	$256,100	$257,415	$86,986
Unit value, 100 pounds	$1.88	$1.41	$1.07
Sulphide—			
Number of establishments	7		
Total production, pounds	21,908,754		
For sale—			
Pounds	5,084,931	(1)	(1)
Value	$106,317		
Made and consumed, pounds	16,823,823		
Other—barium chlorate, dioxide, fluoride, phosphate, thiocyanate, etc.	$646,758	$103,204	(1)
Bismuth:			
Subnitrate—			
Number of establishments	7		
Total production, pounds	283,286		
For sale—			
Pounds	279,786	(1)	(1)
Value	$811,487		
Made and consumed, pounds	3,500		
Other, nitrate, oxide, subgallate, etc., and metal	$424,015	(1)	(1)
Bromine:			
Liquid—			
Number of establishments	5		
Pounds	211,555	(1)	(1)
Value	$92,047		
Other—ammonium, calcium, potassium and sodium bromides and bromates, organic bromides, etc., (see the respective groups)	$1,425,684	(1)	(1)
Calcium:			
Acetate—			
Number of establishments	86	78	.....
Total production, tons	84,478	83,542	.....
For sale—			
Tons	76,955	81,761	70,739
Value	$2,682,232	$2,138,909	$2,118,443
Unit value, ton	$34.85	$26.16	$29.95
Made and consumed, tons	7,523	1,781	.....
Chloride—			
Number of establishments	15	7	.....
Tons	74,699	44,753	(1)
Value	$1,043,301	$342,271	.....
Unit value, ton	$14.00	$7.65	.....
Phosphate—			
Number of establishments	7	3	.....
Pounds	44,270,166	24,192,974	.....
Value	$4,727,364	$1,298,566	(1)
Average value, 100 pounds	$10.72	$5.37	.....
Other—calcium bisulphite, bromide, carbonate, hypochlorite, sulphide and sulphate, etc., $5,172,241; carbide, citrate, ferrocyanide, lactate, lactophosphate, sulphocarbolate, etc., $10,436,916	$15,609,157	(1)	(1)
Cerium compounds—carbonate, chloride, dioxide, fluoride, nitrate, oxalate, etc.	$132,283	(1)	(1)
Chromium sulphate, and chromium compounds, n. e. s. (see Group V)	$610,933	(1)	(1)
Cobalt, salts and compounds	$217,689	(1)	(1)

[1] Figures not available; included with unclassified.

TABLE 33.—GROUP X.—CHEMICALS, NOT ELSEWHERE SPECIFIED—Continued.

	1919	1914	1909
Copper:			
Carbonate—			
Number of establishments	5		
Pounds	327,949	(1)	(1)
Value	$92,230		
Sulphate (blue vitriol)—			
Number of establishments	14	14	.....
Pounds	35,287,881	37,152,351	36,546,553
Value	$3,164,611	$1,598,944	$1,531,574
Average value, 100 pounds	$8.97	$4.30	$4.19
Other copper salts and compounds	$575,537	$14,383	.....
Gold:			
Chloride—			
Number of establishments	4	.....	.....
Ounces	7,229	28,819	42,544
Value	$76,152	$291,658	$430,944
Other gold salts and compounds	$66,917		
Iodine, resublimed and minor iodides:			
Number of establishments	7		
Pounds	105,731	(1)	(1)
Value	$438,002		
Iron:			
Chloride, crystals (ferric)—			
Number of establishments	7	.....	.....
Pounds	917,849	.....	.....
Value	$71,572	.....	.....
Chloride, liquor (ferric)—			
Number of establishments	9	.....	.....
Pounds	977,133	.....	.....
Value	$64,859	.....	.....
Oxide—			
Number of establishments	6	6	.....
Tons	36,417	.....	.....
Value	$574,970	$105,682	(1)
Sulphate (copperas)—			
Number of establishments	32	29	.....
Tons	[2] 59,383	46,239	[3] 12,819
Value	$993,939	$352,772	$78,467
Unit value, ton	$16.74	$7.63	$6.12
Other iron compounds—			
Inorganic, ferroalloys other than blast-furnace products, iron-by-hydrogen, chloride (ferrous), nitrate, sulphide, vanadate, etc.	$9,274,214		
Organic, acetate, iron ferrocyanide, oxalate, valerate	$661,975	$3,592,793	(1)
Lead:			
Acetate—			
Number of establishments	9	.....	.....
Total production, pounds	5,131,133	.....	.....
For sale—			
Pounds	4,183,621	7,290,936	.....
Value	$552,435		
Made and consumed, pounds	947,512		(1)
Arsenate (see Arsenate of lead).		$474,430	
Other lead salts	$335,906		
Lithium salts, bromide, carbonate, chloride, etc.	$502,542	(1)	(1)
Magnesium:			
Carbonate (precipitated)—			
Number of establishments	4		
Pounds	544,022	(1)	(1)
Value	$70,512		
Chloride—			
Number of establishments	7		
Pounds	26,282,436	(1)	(1)
Value	$445,087		
Oxide—			
Number of establishments	6		
Pounds	9,031,650	(1)	(1)
Value	$1,176,858		
Sulphate (Epsom salts)—			
Number of establishments	20	12	10
Total production, pounds	59,067,335	.....	.....
For sale—			
Pounds	58,696,632	29,265,115	21,621,297
Value	$1,497,077	$296,999	$189,791
Av. value, 100 lbs.	$2.55	$1.00	$0.88
Made and consumed, pounds	370,703	.....	.....
Other magnesium salts, metal, and alloys	$376,843	(1)	(1)
Manganese:			
Borate—			
Number of establishments	3	.....	.....
Pounds	141,828	(1)	(1)
Value	$27,996	(1)	(1)
Other manganese salts and compounds [4]	$71,399	.....	.....
Mercury:			
Chloride, mercuric (corrosive sublimate)—			
Number of establishments	4	.....	.....
Total production, pounds	447,080	.....	.....
For sale—			
Pounds	437,015		
Value	$648,774		
Made and consumed, pounds	10,065		
Chloride, mercurous (calomel)—			
Number of establishments	3	605,701	(1)
Pounds	256,388	$518,023	.....
Value	$414,388		
Other mercury compounds, cyanide, oxide, and miscellaneous preparations	$711,856		

[2] Iron sulphate produced by chemical plants 12,898 tons, by rolling mills 9,738 tons, and by wire mills 36,747 tons.
[3] Includes (1909) 5,845 tons made and consumed.
[4] Not including ferromanganese alloys.

TABLE 33.—GROUP X.—CHEMICALS, NOT ELSEWHERE SPECIFIED—Continued.

	1919	1914	1909
Nickel compounds—carbonate, cyanide, formate, hydrate, nitrate, sulphate, black salts, and miscellaneous	$641,645	$157,149	(1)
Phosphorus, metal, chloride, sesquisulphide, and miscellaneous	$910,591	.....	.....
Radium salts:			
Number of establishments	7	.....	.....
Milligrams	27,627	(1)	(1)
Value	$2,985,777	.....	.....
Silver:			
Nitrate—			
Number of establishments	7	.....	.....
Total production, ounces	3,055,903		
For sale—			
Ounces	3,017,889	2,563,238	2,030,399
Value	$2,184,051	$846,059	$727,428
Unit value, ounce	$0.72	$0.33	$0.36
Made and consumed, ounces	38,014	.....	.....
Other silver salts and compounds, chloride, collargol, cyanide, nucleinate, oxide, proteinate, and miscellaneous	$257,722		
Strontium salts—bromide, carbonate, chloride, iodide, lactate, nitrate, salicylate, sulphate, etc.	$319,373	(1)	(1)
Sulphur:			
Refined—			
Number of establishments	9	.....	.....
Tons	52,099	31,166	25,269
Value	$2,712,944	$1,141,100	$891,501
Unit value, ton	$52.07	$36.61	$35.28
Chloride (red and yellow)—			
Number of establishments	8	.....	.....
Total production, pounds	4,048,066	.....	.....
For sale—			
Pounds	2,353,807	(1)	(1)
Value	$124,088	.....	.....
Made and consumed, pounds	2,294,259	.....	.....
Other sulphur compounds	$15,926	(1)	(1)
Thorium compounds—nitrate, oxide	$664,843	.....	.....
Tin:			
Chloride, stannous (crystals)—			
Number of establishments	4	.....	.....
Pounds	587,963	.....	.....
Value	$251,843		
Unit value, pound	$0.42		
Chloride, stannic (tetra and bi-)—			
Number of establishments	4		
Pounds	8,411,453	8,291,239	10,293,377
Value	$2,735,392	$2,028,511	$1,535,350
Unit value, pound	$0.32	$0.24	$0.15
Oxide—			
Number of establishments	4		
Pounds	1,352,345		
Value	$899,525		
Unit value, pound	$0.67		
Titanium compounds—sodium sulphate, potassium oxalate, etc.[2]	$98,188	(1)	(1)
Uranium compounds—acetate, sodium acetate, chloride, nitrate, nitrite, sodium uranate, etc.	$6,233	(1)	(1)
Vanadium and compounds [2]	$698,678	(1)	(1)
Zinc:			
Carbonate—			
Number of establishments	4		
Pounds	91,683		
Value	$16,645		
Chloride—			
Number of establishments	19		
Pounds	74,089,063		
Value	$4,349,096		
Oxide [3]—			
Number of establishments	5		
Total production, pounds	6,185,602		
For sale—			
Pounds	4,299,602	40,780,886	25,054,213
Value	$374,188	$1,130,959	$472,302
Made and consumed, pounds	1,886,000		
Sulphate—			
Number of establishments	12		
Total production, pounds	12,941,730		
For sale—			
Pounds	7,325,544		
Value	$267,001		
Made and consumed, pounds	5,616,186		
Other zinc compounds—arsenite, borate, cyanide, nitrate, resinate, stearate, sulphocarbolate, valerate, etc.	$442,780		
Other rare earth compounds, n. e. s.—beryllium nitrate, neodymium chloride, zirconium oxide, etc.	$42,171	.....	.....
Other rare metals, n. e. s.—molybdenum, silicon, tungsten	$1,806,978	(1)	(1)
UNCLASSIFIED.			
Crude, commercial, and fine chemicals, not reported separately, value	$4,699,195	$19,184,408	$26,748,736

[1] Figures not available; included with unclassified.
[2] Not including ferroalloys (of Ti. or V., as the case may be).
[3] Not including zinc oxide reported in the paint industry 139,661 tons; value, $24,082,299. Total production from all sources, 142,753 net tons.

Organic (Group X).—A separate presentation of amyl alcohol was possible though the total of 241,254 pounds is but a portion of the fusel oil produced, the bulk being made by the distilling industries and not here included.

Alcohols used for flavoring and perfumery, including a small amount of ethyl and methyl alcohols reported by chemical establishments, amounted to $538,540.

Among aldehydes, formaldehyde still takes leading place, the production being 25,006,815 pounds or nearly three times the weight reported in 1914. Six companies, in five states—New Jersey, Michigan, Pennsylvania, New York, and Missouri—represent the combined production.

Under miscellaneous aldehydes, certain items reported as "Formaldehyde products" or as "Aldehyde products," that might have been more properly placed with synthetic resins or plastics, in the absence of further information are included. These, together with formaldehyde-hydrosulphite, of Group VI, amounted to $1,663,784, so that formaldehyde and its compounds totaled $5,602,100.

Four establishments produced vanillin, almost all originating in New Jersey.

The subgroup, "Carbon and hydrocarbon compounds," was difficult to delimit, as some items were of rather indefinite character. Calcium carbide was reported by six establishments in five states—Michigan, New York, Minnesota, Virginia, and Iowa. The production of 15,469,567 pounds of carbon bisulphide is a notable increase over 1914. Eight plants in five states—New York, Michigan, Pennsylvania, California, and West Virginia—made this chemical, a large proportion, nearly 25 per cent, being consumed in the works where made.

Apparently the production of amyl acetate is decreasing, a cheaper substitute having been found. In 1909 the production was 1,470,568 pounds; in 1914 it was 1,300,052 pounds, and in 1919, including that made and used in the same works, 906,764 pounds. On the other hand, the production of ethyl acetate or acetic ether in 1919 was 5,780,549 pounds, of which 54 per cent was used in the same works for further manufacture.

Acetone, acetone oil, and methyl acetone were made largely by the old process of dry distillation of acetate of lime. One firm reported acetone made from fermentation acetic acid. During the war molasses was fermented and the alcohol converted to acetic acid and acetone, but no production was reported for 1919. Butyl alcohol, a by-product of fermentation processes is now much in demand as a solvent.

Other alcohols, aldehydes, hydrocarbons, esters, ethers, halogen compounds, ketones, and miscellaneous organic chemicals were made in great variety and in some instances in large quantities. Sulphuric ether has doubled in quantity and price. Nitrous

ether, carbon tetrachloride, ethyl chloride, acetone oil, and methyl ethyl ketone are reported separately for the first time. Comparisons with 1914 are therefore not possible, but a large increase in production is at least indicated.

A summary of the chemicals under the heading "Other" in each subgroup follows, the most important being given in order of their value:

Alcohols.—Resorcinol, terpineol, guaiacol, geraniol, iso-eugenol.

Aldehydes.—Chloral hydrate, heliotropin, anisic aldehyde, decyl aldehyde, citral.

Carbon and hydrocarbons.—Carbon electrodes, condensed smoke, refined carbon, stearin pitch, paraffin wax.

Esters.—Ethyl butyrate, butyl acetate, amyl butyrate, amyl valerate, ethyl formate.

Ethers.—methyl ether and miscellaneous (can not separate).

Halogen compounds.—Iodoform, brom camphor, ethyl bromide, acetyl chloride, tetrachlorethane.

Ketones.—Violet ketone and miscellaneous (can not separate).

Miscellaneous.—Camphor, sulphone methanes, diphenylamine, osseine, oleo resin vanillin.

Inorganic (Group X).—The totals for the subgroups have been made to cover all chemicals containing the characteristic element, and therefore include some items appearing in other places in this group or in other groups which because of their composition belong in more than one class. For instance, arsenic compounds would not be complete without arsenous and arsenic acid anhydrides; barium compounds without the dioxide; nor calcium compounds without the carbide and hypochlorite. Each group within itself is a unit, so far as possible, but as a result there are duplications and the grand totals can not be used for comparisons without limitation.

The summary which follows involves many omissions and inequalities. Sulphur, for instance, does not include sulphuric and sulphurous acids, and the infinite number of other sulphur combinations. Chromium does not include its ferroalloys, nor have ferroalloys been considered except as reported to the chemical industries proper.

The inorganic products of this group may be further classified into (*a*) *nonmetals* or negative elements, such as chlorine, bromine, iodine, phosphorus, silicon, and sulphur; (*b*) *alkali earths*, barium, calcium, lithium, magnesium, and strontium; (*c*) *rare earths*, cerium, thorium, and other (beryllium, neodymium, zirconium); (*d*) *common metals* (forming basic salts)—cobalt, copper, iron, lead, mercury, nickel, and zinc; (forming basic and acid salts)—antimony, arsenic, bismuth, chromium, manganese, and tin; (*e*) *rare metals* (forming basic salts)—gold, platinum, radium, silver; (forming basic and acid salts)—molybdenum, titanium, tungsten, uranium, and vanadium.

Potassium and sodium, which would naturally form a separate group as alkalies, closely related to alkali earths, and aluminum, which would belong in (*d*), have been considered as separate groups.

Arranged in order of decreasing value the totals of the subgroups as shown in Table 33, combined with chemicals containing the characteristic element from other groups, stand as follows:

SUBGROUP.	1919	SUBGROUP.	1919
Calcium	$24,062,054	Bromine	$1,499,738
Silicon	18,407,429	Bismuth	1,235,502
Iron	11,641,530	Antimony	1,190,027
Phosphorus	10,877,547	Lead	888,341
Other rare metals	9,614,061	Thorium	664,843
Chromium	7,122,230	Nickel	641,045
Zinc	5,449,710	Lithium	502,542
Copper	4,671,656	Strontium	319,373
Tin	3,886,760	Cobalt	217,689
Magnesium	3,613,204	Gold	143,069
Arsenic	3,527,740	Cerium	132,283
Radium	2,985,777	Vanadium	102,678
Sulphur	2,852,958	Manganese	99,395
Silver	2,441,773	Titanium	98,188
Iodine	1,904,130	Other rare earths	42,171
Mercury	1,775,018	Uranium	6,233
Barium	1,683,503	All other	4,699,195

Nonmetals or negative elements.—The nonmetals are found or produced in the elemental form and appear as such in Group X. They also occur as acids, shown in Group I, or salts of these acids, found in all groups.

Chlorine has been considered in Group VI as a bleaching agent, and its compounds as hypochlorites also. Chlorates are chiefly used in the explosives industry or medicinally. Chlorides are so plentiful in nature that their production is confined mainly to refining methods. The largest production of chlorides is in the form of sodium chloride or common salt, included elsewhere as a separate industry.

Bromine was produced from the mother liquors of salt deposits partly by direct electrolysis, partly by treatment of the liquors with electrolytic chlorine, and partly by chemical processes. Five establishments in Michigan and Ohio made liquid bromine, which is a valuable assistant in organic syntheses and is used medicinally and for photographic purposes. Its principal value, however, lies in its combinations as bromides and bromates, which, although they have been included in other groups, are gathered under the heading "Bromine" to complete this item.

Calculating each salt to its bromine content, assuming 95 per cent purity, the total amount of bromine represented on the chemical tabulation for 1919 was 2,165,000 pounds. These figures do not include bromine compounds produced by the coal-tar, pharmaceutical, perfume, and other synthetic organic chemical industries, which employ large quantities.

Iodine is found in the form of iodates in Chile saltpeter and as the iodide in ashes of sea plants. Firms reporting iodine, resublimed, and various organic and inorganic iodides, were manufacturers of fine chemicals, some giving crude iodine as material. In all, 438,000 pounds of iodides, valued at $1,499,976, were produced, and included potassium iodide, sodium iodide, iodoform, thymol iodide, potassium iodate, ethyl iodide, and cadmium iodide. These with resublimed iodine made the value of the whole group

$1,904,130. Calculating the iodides to their iodine content, the total iodine represented on the table was 438,878 pounds, three-fourths of which was combined.

Phosphorus, as phosphates, finds its largest use in the fertilizer industry, which is elsewhere reported. As an element it is widely used in technical processes and in alloys, while in combination with oxygen it forms acids and salts. It has the additional power of combination with more negative elements as phosphorus sulphides and chlorides, and in conjunction with hydrogen may act as a base, as in phosphonium compounds. Five concerns made elemental phosphorus, the oxychloride, sesquisulphide, trichloride, and pentachloride, in order of value. A little more than 2 per cent of the element was in the form of red phosphorus. Nearly all of the derivatives were made from phosphorus, which was derived from phosphate rock largely or entirely by electrothermic processes.

Combinations of phosphorus occur elsewhere in the table as glycerophosphoric, hypophosphorous, and phosphoric acids, in Group I; as ammonium, potassium, and sodium hypophosphites and phosphates, in Groups II, III, and IV; and as barium and calcium phosphates in Group X, alkali earth compounds. The total for all of these was 126,226,000 pounds, of a value $10,877,547, the most valuable being calcium phosphate, sodium phosphate, phosphoric acid, and ammonium phosphate.

Although *silicon* in the form of the oxide and of silicate rocks is the commonest mineral known, and its employment as an ingredient of resistant materials and apparatus is very extensive, in the chemical industry as such it has appeared to a limited extent only as soluble silicates used in the paper and textile industries. Since the production of elemental silicon and its alloys by electrolytic processes, however, this chemical and its compounds have become of much greater importance. The total amount as derived from the tables including silicon carbide and derivatives, sodium silicate, ferrosilicon, sodium silico fluoride, copper-silicon, silicon metal, and silicic acid, represents more than 312,000 tons, and $18,407,429.

Nine establishments in six states—New Jersey, New York, California, Texas, Maryland, and Missouri—refined 52,099 tons of *sulphur*, none of these plants producing the chlorides. Eight concerns in five states—Michigan, West Virginia, New York, California, and New Jersey—produced 4,648,066 pounds of sulphur chlorides, largely of the yellow variety, almost 50 per cent of the total production being used in the same plant for further processes of manufacture. All of these chlorides were made from sulphur and electrolytic chlorine.

Alkali earths.—The alkali earths occur in Group X as elements, alloys, or salts, and in other groups as bleaching compounds and electrolytic products.

The figures for *barium* compounds are exclusive of the paint and pigment industry which is the largest producer of sulphide, sulphate, carbonate, and chloride. In order of decreasing weight, including made and consumed, the items reported separately in 1919 are the sulphide, sulphate, carbonate, chloride, dioxide (for detail, see Group VI), and nitrate; while in order of value for the part sold this becomes dioxide, carbonate, sulphate, chloride, sulphide, and nitrate. That is, the sulphide and dioxide exchange places, since the latter had a high value as the basis for peroxide bleaches and the former was about 77 per cent by weight made and reused in the same plant, with no value assigned. About 55 per cent of the nitrate was made and reused.

Barium compounds are derived from the sulphate and carbonate minerals, large quantities of the former being mined in the United States. These may be ground and used directly as pigments but are even more valuable when first converted to soluble salts and reprecipitated in very finely divided condition as the sulphate or carbonate. The peroxide is made by roasting the carbonate to the oxide and further roasting it with excess oxygen. The sulphide is produced from the sulphate by roasting with a reducing agent such as coal. It is used largely for the manufacture of sodium sulphide, a chemical much in demand in the application of sulphide colors in the dyeing industry. Barium chloride and nitrate, both water soluble, find many applications in ceramics, explosives, as source of green light, and in solution for the precipitation of finely divided barium pigments and color lakes.

Other barium compounds in the table consist of the phosphate, chlorate, fluoride, thiocyanate, and miscellaneous salts, the phosphate forming a very large proportion of these. The total production of barium compounds was 31,503 tons, the part reported for sale being valued at $1,683,503.

A great variety of *calcium* compounds are represented, the arsenate, bisulphite, bromide, carbide, ferrocyanide, and hypochlorite being duplicated in other groups or subgroups of Group X. Including these, a total of 451,690 tons of calcium compounds valued at $24,062,054 were produced, not including 26,123 tons of calcium-magnesium chloride of a value of $321,596 reported by the salt industry, nor does it cover the use of calcium in the organic chemical industries. Calcium may be said to rival sodium and potassium in importance as a chemical base.

In order of value the compounds of calcium rank—carbide, phosphate, hypochlorite, acetate, chloride,

arsenate, precipitated sulphate, citrate, precipitated carbonate, lactate, ferrocyanide, sulphocarbolate, bromide, etc. The carbide and hypochlorite constitute 90 per cent of the whole. Carbide is included with the electrolytic chemicals, the bisulphite and hypochlorite in Group VI, the arsenate is valuable for its arsenic content and is shown in Group X with arsenic; the sulphate, carbonate, sulphide, and oxide in bulk are used as pigments, cements, in metallurgy and ceramics and do not appear here, but in purified condition are used as dentifrices, medicinally, and as reagents, and are included among chemicals. The ferrocyanide is a by-product of the gas and coke industries and in bulk is employed for the production of ferrocyanogen pigments, referred to under Group II. Bromide, citrate, lactate, lactophosphate, and sulphocarbolate of calcium are mainly useful medicinally and for photographic purposes.

Calcium compounds are derived from carbonate, phosphate, and sulphate mineral deposits. The former when burned to the oxide or quicklime and then dissolved in water or "slaked" to form the hydroxide, is the basis for many of the salts.

Calcium acetate is the basis for production of acetic acid in all three forms, and of acetone. The amount shown in the table was produced by the wood distillation industry, 86 establishments in 11 states reporting 84,478 tons, 1 establishment reporting brown acetate, the others the gray variety. Three plants made and consumed part of their product. Fourteen concerns in Michigan made 47.2 per cent of the total. Seventy-five plants in Michigan, Pennsylvania, and New York produced 89 per cent and 11 others in Wisconsin, Missouri, Tennessee, West Virginia, Connecticut, Kentucky, Alabama, and Mississippi the remaining 11 per cent.

Calcium chloride was made in 15 plants in 6 states—New York, Michigan, West Virginia, Ohio, California, and Missouri—a total of 74,699 tons, valued at $1,043,301, the unit values running from $5 to $32 a ton, and averaging $14. Seven establishments in New York and Michigan produced 92 per cent of the whole. The increase from 1914 to 1919 was 67 per cent in weight and about double in price and number of establishments.

One establishment obtained calcium chloride from natural brines by evaporation; three were refiners; others produced it from lime and hydrochloride acid; others from electrolytic chlorine, probably as a by-product; and a large part was the by-product of the Solvay soda process. Calcium chloride is valuable in the dry and wet condition, and was sold both ways. In dehydrated form it is used as a drying agent and preservative, for fireproof paint and sizing. In solution as brine, it finds application in freezing and cooling operations, as an antifreezing solution in automobile and airplane radiators, and as a dust preventive.

Seven establishments in Illiinos, Misouri, New Jersey, and New York made 44,270,166 pounds of calcium phosphate, valued at $4,727,364, three in Illinois producing 72.3 per cent of the total amount. None was reported as made and consumed in the same plant. The total does not include crude acid calcium phosphates of the fertilizer industry. It was all, however, the acid phosphate or dicalcium phosphate. Like the chloride, the phosphate is marketed both dry and in solution.

Lithium salts were not reported separately in sufficient detail to indicate accurately the relative proportions of the different salts. As shown, the carbonate, bromide, and chloride were made in the order named. The total of $502,542 was the value of 466,595 pounds sold, 277,185 pounds in addition being made and used in the same establishment, or a total of 743,780 pounds of miscellaneous lithium salts.

A total of $3,613,203 for *magnesium* and its salts in 1919 represents several items not reported separately in previous years. The carbonate was largely of the light precipitated variety, and the rest of highly refined grade. Four establishments in Pennsylvania, California, and New York produced it. Seven plants in Michigan, California, Ohio, and Pennsylvania made 13,141 tons of the chloride largely from brines, about 91 per cent being produced in three plants in Michigan. Six concerns reported 9,031,650 pounds of the oxide of magnesium. The states represented were Pennsylvania, California, and New York.

Magnesium sulphate or Epsom salts was the most valuable of the magnesium compounds. A total of 59,067,335 pounds was reported by 20 establishments in 10 states—Ohio, Michigan, Maryland, Illinois, Georgia, Washington, Pennsylvania, California, New York, and Missouri—4 plants in Ohio making 40 per cent of the total. Prices varied greatly, the average being 2.5 cents per pound. Increases in the periods 1909 to 1914 and 1914 to 1919 were 35.3 per cent and 101.8 per cent, respectively.

All other magnesium compounds consisted in large part of the metal, the fluosilicate, arsenite, and alloys, with a considerable amount of unspecified salts. Magnesium compounds are derived mainly from the carbonate, which exists plentifully as a mineral, by calcination or solution. It has many applications technically which require production in large bulk and is not considered nor reported with chemicals.

Strontium salts were reported in considerable variety, as nitrate, carbonate, bromide, chloride, iodide, lactate, salicylate, and sulphate, the first three comprising 98.6 per cent of the quantity and 92.8 per cent of the total value of all strontium salts. Almost all were produced by manufacturers of fine chemicals, as strontium and its salts are employed usually for their medicinal qualities, or as the source of red signal lights, or flares and

other pyrotechnics, and for coloring iridescent glass. Qualities ranged from crude to chemically pure.

Rare earths.—Rare earths, so-called, have been distributed through the table in three items, cerium compounds, thorium compounds, and other rare earths, including beryllium, neodymium, and zirconium oxides and salts. The total value of these earths was $839,297, of which thorium derivatives constituted nearly 80 per cent.

Thorium compounds, value $664,843, consisted of several derivatives of which thorium nitrate and mesothorium together amounted to over 99 per cent in value. Four plants in New Jersey produced all of it, from monazite sand. *Cerium* compounds were valued at $132,283, and were reported as the fluoride, chloride, oxalate, nitrate, carbonate, dioxide, and miscellaneous products. Other rare earths, $42,171, included *zirconium* oxide, *beryllium* nitrate, *neodymium* chloride, and miscellaneous products.

Common metals.—Many of the common metals are useful as such and as salts in which they appear as the basic element, and in addition may be combined with oxygen to form negative groups or acid rests which, with more basic elements, find extensive employment technically. Those metals which, from a commercial standpoint, are usually basic or electrolytically positive, appearing only as metals, alloys, or in salts as the positive element, are cobalt, copper, iron, lead, mercury, nickel, and zinc, while those metals which are not only useful as above but also form salts in which they are part of the negative group are antimony, arsenic, bismuth, chromium, manganese, and tin. These metals, giving a greater variety of combinations, are to be found, like the acids, in other groups as antimoniates, arsenates, bismuthates, chromates, manganates, and stannates, of sodium, potassium, calcium, etc.

Antimony metal and its alloys were not reported on the chemical schedule. Its compounds are used mainly as pigments, precipitated as the sulphide or as dye lakes, or as mordants in the leather and textile industries. A total of 4,045,619 pounds having a value of $1,190,027, of antimony derivatives were reported by 11 establishments in 5 states—New York, New Jersey, Massachusetts, Connecticut, and Missouri. Potassium antimonyl tartrate is also classed with Group IV. The sulphide ore stibnite or antimony needles, either directly or after conversion to the metal or oxide, was the raw material used.

Arsenic and its compounds as reported here are exclusive of arsenical insecticides as such, nor are returns from the mining and metallurgical industries included. Arsenic compounds originate with the sulphide ores, arsenical pyrites, orpiment or related ores, which when roasted give a sublimate of the oxide (white arsenic or arsenious acid anhydride), which may be (*a*) reduced to the metal, (*b*) combined directly with hydrogen sulphide in acid solution with or without oxidizing agents to form the sulphide pigments, (*c*) combined directly with copper acetate to form copper acetoarsenite, (*d*) combined with a soluble salt of sodium to form sodium arsenite or, under oxidizing conditions, sodium arsenate, (*e*) which latter salts are further treated with soluble salts of metals to form calcium lead, copper or zinc arsenic compounds. The principal value of arsenic compounds is as germicides and insecticides.

As the oxide, white arsenic, derived from the sulphide ore by roasting, is the basis for many arsenic salts, naturally large quantities were reported as made and consumed. All plants making the oxide also produced calcium and lead arsenates and altogether 16 plants in 11 states were engaged in making arsenical products. Michigan, Illinois, Indiana, Maryland, California, and Wisconsin each produced more than 1,000,000 pounds of lead arsenate or together about 84 per cent of the total amount of 11,514,275. Indiana, Illinois, and Wisconsin each turned out over 200,000 pounds of calcium arsenate. Some of the arsenical products reported in "other" were in large amounts, copper acetoarsenite, the acid anhydrides, sodium arsenate, and zinc arsenite comprising 95 per cent of the entire value of this item.

The total value of *bismuth* salts was $1,235,502, eight establishments in four states—New Jersey, Missouri, Pennsylvania, and New York—which claimed nearly equal amounts, reporting the subnitrate, metal, subgallate, nitrate, and oxide, in order as named. As over 9 per cent of miscellaneous, unenumerated salts were included, however, the order is uncertain. All of the companies, except one mining concern, were manufacturers of fine chemicals in grades suitable for medicinal purposes.

Inasmuch as *chromium* compounds are valuable in all combinations for their chromium content, the total as shown in the table may be extended to include chromic acid, and chromates and bichromates of sodium and potassium. Chromates of sodium, potassium, chromium alum, chromium sulphate, chromic acid, and unspecified chromium compounds altogether amounted to 54,774,818 pounds, valued at $7,122,230, and were made by 11 establishments in 7 states—New Jersey, Maryland, New York, Illinois, Massachusetts, Missouri, and Pennsylvania. Chromium metal and its alloys are not included.

Sodium chromate or bichromate, obtained by fusion of chrome iron ore with soda, is the basis of all other chromium salts which as a class are used principally as textile mordants, for tanning leather, printing, bleaching, making inks, varnishes, for medicinal purposes, photography, fireworks, and minor applications.

Some sodium chromate, about 4 per cent, was reported as made and reused in the same establishment, but not in sufficient amounts for the derived salts. Potassium chromate was made by establishments reporting the sodium salt.

Chromium sulphate and the double salt, ammonium-chromium sulphate or chrome alum, are closely related to each other in composition and to the chromates, so far as their applications are concerned, although the metal as stated above exists as a relatively basic element in the former and as an acidic one in the latter salts.

The most important compound of *cobalt* is the oxide, which is used as a component of driers for paints and as a blue coloring agent for materials that are subjected to high temperatures while in preparation, such as metals and products of the ceramic industries. A peculiar trade fashion has obtained, which is to name several compounds of cobalt, the carbonate, phosphate, and arsenate as the "oxide," with letters to designate or differentiate them. All are used for about the same purpose. It is not known how much of the oxide reported in 1919 consisted of these other compounds. Four establishments reported cobalt salts, $217,689, two of which employed the original ore, while the chloride, nitrate, sulphate, acetate, linoleate, resinate, and others were produced from the oxide, purchased as such.

Statistics of *copper* chemicals should include blue vitriol or copper sulphate, which is the basis of many of the other salts, but is produced as a by-product of the smelting and refining industries. Five concerns were reported by the Geological Survey as making bluestone, of copper content 7,882,574 pounds, which sold for $2,825,557. Using a factor for conversion, this amounted to 31,081,289 pounds of crystallized sulphate and has been included in the totals on the table. All copper compounds aggregated 39,197,000 pounds and $4,671,656 and consisted of the sulphate, arsenic compounds, cyanide, carbonate, nitrate, chloride, acetate, oxides, and miscellaneous unenumerated salts. The first five mentioned equaled over 99 per cent and the sulphate alone nearly 70 per cent of the total value.

As with copper, the great bulk of *iron* compounds was not reported by chemical manufacturers, but as products of metallurgical industries.

Ferroalloys reported by the chemical industry formed but a portion of the total production, blast-furnace alloys not being included. Separate figures are not given, but the kinds were ferrosilicon, ferrochrome, ferrovanadium, ferromolybdenum, ferrotungsten, and ferromagnesite, in the order named.

Iron chloride, crystalline and liquid, made by manufacturers of fine chemicals, amounted to 1,894,982 pounds and $136,431. Twelve establishments in six states, Michigan, New York, Pennsylvania, Missouri, Ohio, and New Jersey, reported; seven of these, in Michigan and Pennsylvania, made 70 per cent of the total.

Iron oxide was made by six plants in six states—Illinois, New Jersey, Pennsylvania, California, New York, and Ohio. Two of these produced "iron sponge" for gas purification from iron borings and shavings; two used pyrites for making sulphuric acid and reported gas ore or burnt pyrites, desulphurized; and two produced refined oxide.

Ferrous sulphate or copperas figures were collected from steel works, rolling mills, and wire mills and from the chemical industries. Thirty-two plants in 12 states made 59,393 tons of copperas, which sold for $993,939. Five states—Pennsylvania, Illinois, Rhode Island, Ohio, and Massachusetts—made 50,646 tons, or 85 per cent. Thirteen wire mills reported 36,747 tons at an average of $18.20 a ton, seven steel works and mills returned 9,738 tons averaging $12.40 a ton, and chemical establishments reported 12,907 tons at $15.60 a ton. Part of the ferrous sulphate of the chemical industry was made by refining crude salts, part from pyrite and waste pickling liquor, and a part from metallic iron with acid.

Other iron compounds included ferro-alloys, ferrocyanide, iron mix, the vanadate, ferric sulphate, the sulphide, iron by hydrogen, the acetate, nitrate, valerate, oxalate, ferrous chloride, and miscellaneous unspecified salts. Excepting the first three, all were made in grades classed as fine chemicals. Metallic iron and pyrite with the respective acids were used very largely as materials.

Lead salts from the purely chemical industries were apparently reported in less quantity in 1919 than in 1914. Large amounts of acetate, nitrate, and monoxide were made and consumed in further processes. A total of 5,131,133 pounds of the acetate were reported by nine establishments in six states. Other salts included the peroxide, nitrate, monoxide, sulphate, resinate, and miscellaneous salts, which totaled 3,697,892 pounds, having a value of $335,906. If amounts made and reused in the same establishments are considered the total weight manufactured was 20,343,300 pounds, with an assigned value of $2,978,682.

The largest use for *manganese* is in metallic form alloyed with iron. Exclusive of this, a variety of manganese compounds were reported in 1919, the borate, resinate, carbonate, dioxide, hypophosphite, sulphate and other salts and driers, making in all 549,891 pounds and $99,395. Seven plants in five states—Pennsylvania, Missouri, Ohio, New Jersey and New York—made these salts of a quality used for varnish and oil driers, or of medicinal grade. They

were derived mainly from the hydroxide which is precipitated by caustic alkali from solution of a soluble salt derived from the oxide ore.

A total of 1,145,500 pounds with a value of $1,775,018 represents *mercury* salts for 1919, including in addition to the two chlorides, calomel and corrosive sublimate, the oxide, white precipitate (ammonium mercury chloride), nitrate, blue mass, iodide, cyanide, and miscellaneous mercurials. Eight establishments in four states—New Jersey, New York, Pennsylvania, and Missouri—produced these mercury salts, all being manufacturers of fine chemicals.

The production of *nickel* salts since 1914 has increased greatly. The hydrate, refined salts, sulphate, oxide, cyanide and carbonate were produced in order of value as named, by eight plants in four states, making a total of 1,062,047 pounds valued at $641,645. A very large part consisting of the hydrate is employed for the production of catalysts.

Ten companies in four states—New Jersey, Pennsylvania, Ohio, and Massachusetts—produced *tin* compounds in the form of chlorides or as oxide. Grades and prices varied widely in both. A considerable proportion of the tin for the chlorides was derived from the detinning of scrap, using electrolytic chlorine in large quantity, either produced at the plant or purchased as liquid chlorine. For the oxide, flue dross or pig tin was employed. The distinction between so-called bichloride of tin and the other chlorides was not clearly made in the reports, so the figures for stannic chloride were made to include both "bichloride" and tetrachloride, while stannous chloride covers tin crystals only. The sum of all tin compounds was 10,351,761 pounds, valued at $3,886,760.

Zinc, in common with many other metals included in Group X, has large uses outside of the chemical industries proper. Zinc oxide, produced directly from the sulphide ores, the carbonate, and the sulphide especially in combination as lithopone, are reported in large quantities by the paint and pigment industry. Almost half the composition of the best auto tires on the market to-day is said to be lead-free zinc oxide. This filler gives white color and resiliency and increases tensile strength and durability. The mining and smelting industries give returns for metallic zinc and zinc sulphate as a by-product of these industries but this is not included in this report. Zinc sulphate finds its largest use as a soluble salt for the precipitation of finely divided zinc pigments, and it is also the origin of a large proportion of the zinc salts. It is in fact the most important salt of zinc, being made and consumed in large quantities for further manufacture. Over 43 per cent of the total amount reported was made and reused but this does not account for all the purposes for which it was used.

The total for all zinc compounds reported to the chemical industries, not including returns from smelting, paint and pigments, amounted to 87,833,780 pounds and a value of $5,449,710. In addition to the salts shown separately, this includes the stearate, cyanide, arsenate, silicate, sulphocarbolate, valerate, borate, resinate, and nitrate. The chloride formed about 78 per cent of the weight and 80 per cent of the total value of the entire group but this does not present a fair comparison with the sulphate, for which returns were not complete. The chloride is used largely as a wood preservative, in dyeing silks and as a dehydrating and condensing agent in the synthetic dye and organic chemicals industries. As dust, or in granular form zinc is used for the generating of nascent hydrogen in reduction processes. The great variety of zinc salts produced in small quantities are mainly of importance medicinally.

Rare metals.—Like the commoner metals, rare metals function in more than one relation, most of them appearing in alloys with more common metals to which they impart some special and valuable property, and also in salts in which they may be either positive or negative to other elements present. The metals usually classed as the precious metals, gold, silver, and platinum, as such, are not reported in chemical totals. Their salts show the metals as basic. Radium also is isolated only as basic salts. Molybdenum, titanium, tungsten, uranium, and vanadium, however, are found technically as metallic alloys, as the metal and its basic salts, which are primarily found in Group X, and in combinations as negative elements in molybdates, alkali titanium oxalates or acetates, tungstates, and phosphotungstates, uranates, and vanadates. These latter therefore are to be found in other groups in addition to Group X.

Gold chloride, cyanide, gold sodium chloride, the bromide and some refined metal were reported as a total of 14,844 ounces, valued at $143,069 by six concerns in New Jersey, Missouri, and Pennsylvania.

Silver salts increased in weight 26 per cent from 1909 to 1914, and about 20 per cent in the subsequent five years. Besides the nitrate, the protein salts and cyanide were mainly the cause of this growth. The average price was slightly lower in 1914 but doubled in the later census. Ten establishments made silver salts, totaling 3,669,000 ounces, and $2,441,773, in the four states of Pennsylvania, New Jersey, New York, and Missouri. Seven plants in four states—Pennsylvania, New York, Missouri, and New Jersey—made silver nitrate.

All of the other rare metals are employed in valuable alloys with iron and other commoner metals. Molybdenum, titanium, tungsten, uranium, and vanadium in conjunction with radium and the precious metals, have been classed as rare metals, although they are no

longer rare in the sense of being scarce and little known. They are in fact widely known and used, although in small quantities as yet because of the difficulty and cost of separating them from their ores. They are usually derived from the oxide or sulphide ores.

A statement of the quantity and value of 1919 production follows:

	Weight.	Value.
	Pounds.	
Molybdenum and compounds metal, oxide, alloys	605,094	$886,166
Titanium and compounds salts, sulphate, oxalate	1,049,820	98,188
Tungsten and compounds metal, alloys, oxide	1,578,630	1,527,845
Uranium and compounds salts, acetate, uranate	2,572	6,233
Vanadium and compounds metal, alloys, oxide, salts	641,749	1,519,679
Radium salts, gold and silver		5,570,619
Total		9,608,730

Molybdenum and its compounds include the metal, its oxide or acid anhydride of molybdic acid, and alloys with tungsten and iron. Titanium figures include the salts, titanium sodium sulphate, and titanium potassium oxalate, which were made by three companies in Pennsylvania, Illinois, and New York. Titanium compounds are used as mordants and the metal in alloys, none of which were reported to the chemical industry. Rutile, a dioxide of titanium occurring as a mineral in several of the states, is the main source of titanium.

Tungsten and compounds were returned as the acid anhydride, as metal and as alloys with iron, chronium, and molybdenum. Uranium and its compounds, like titanium, appeared only as salts, sodium uranium acetate, sodium uranium nitrate, sodium uranate, and others. Vanadium reports covered the acid anhydride or oxide, the metal, alloys with iron and salts, such as iron vanadate.

Radium salts were reported by seven establishments, a total of 27,627 milligrams, with a value of $2,985,777 from four states—Pennsylvania, Colorado, Illinois, and New Jersey. With the exception of the bromide, the kind of salts was not indicated. The unit value averaged about $108 per milligram.

The total of "Unclassified," crude, commercial, and fine chemicals, may be subdivided into chemicals sold in bulk, usually about 5 cents a pound or less, valued at $110,778, and fine chemicals at 25 cents a pound and above, which amounted to $4,588,417 so far as could be determined from the class of products otherwise reported, and the general character of the establishment. The latter class consisted of a very large number of separate items which could not well be distributed by the manufacturer making the report, but is incomplete in that some manufacturers of corresponding grades of fine chemicals did make such separations.

CHEMICALS MADE BY THE AID OF ELECTRICITY.

Inasmuch as a classification of chemicals made by the aid of electricity depends upon methods of manufacture, and not upon the chemical composition of the product, they appear in the various groups of chemicals according to composition.

The electrolytic and electrothermic processes have developed greatly, especially within the period covered by the war. Bridgeport, Conn., is said to have installed 52 electric brass furnaces during 1919; 26,000 tons of electrolytic zinc were reported, and an electrolytic process for the deposition of iron in the form of tubes from a solution of iron in hydrochloric acid, was developed. These and other of the most important products made by the aid of electricity are not included within the chemical industry. Aluminum, which ranks fifth in importance among metals, being surpassed only by iron, copper, zinc, and lead, and some of the less important metals and alloys, abrasives, carbides, some of the ferroalloys, and a variety of purely chemical compounds, however, are within the chemical industry.

Table 34 presents the statistics for this class of products.

TABLE 34.—CHEMICALS PRODUCED BY THE AID OF ELECTRICITY: 1919.

	Number of establishments.	Quantity.	Value.
Total:			
1919	[1] 114		$82,590,005
1914	36		29,061,949
1909	19		18,451,461
1904	21		7,068,246
1899	14		2,045,535
Chlorine bleaches (Group VI):			
Chlorine ... pounds	14	91,141,000	
For sale ... pounds		34,392,000	1,425,917
Made and consumed ... pounds		56,749,000	
Hypochlorites (calcium and sodium, chiefly calcium) ... pounds	16	252,850,000	4,781,348
Hydrogen (Group IX) ... cubic feet	40	137,082,000	851,397
Oxygen (Group IX) ... cubic feet	39	131,477,000	1,855,911
Potassium hydroxide [2] (caustic, Group IV), pounds	3	7,460,000	1,892,438
Sodium hydroxide [2] (caustic, Group III) ... pounds	15	189,686,000	
For sale ... pounds		173,021,000	6,228,682
Made and consumed ... pounds		16,665,000	
Other commodities in order of value, with number of establishments: Aluminum, 4; abrasives (silicon carbide and aluminous, including forms) 4; calcium carbide, 5; ferroalloys, 7; sodium and sodium cyanide, 4; chlorates, 5; phosphorus, 2; carbon bisulphide, 8; vanadium, 1; tungsten and molybdenum, 3; hydrochloric acid, 3; magnesium metal, 4; bromine, 5; other metals and alloys, 4; and miscellaneous, 10			65,554,312

[1] Distribution, by states:

Total	114	EAST NORTH CENTRAL:		SOUTH ATLANTIC:	
NEW ENGLAND:		Ohio	6	Maryland	1
Maine	2	Indiana	2	Virginia	4
New Hampshire	1	Illinois	1	West Virginia	4
Massachusetts	1	Michigan	11	North Carolina	1
Rhode Island	1	Wisconsin	2	EAST SOUTH CENTRAL	3
Connecticut	1	WEST NORTH CENTRAL:		WEST SOUTH CENTRAL	5
MIDDLE ATLANTIC:		Minnesota	1	MOUNTAIN	2
New York	26	Iowa	2	PACIFIC:	
New Jersey	8	Missouri	5	Washington	3
Pennsylvania	14	Nebraska	1	Oregon	1
				California	5

[2] Total production:

	Sodium hydroxide.		Potassium hydroxide.	
	Tons.	*Per cent.*	*Tons.*	*Per cent.*
Total production	333,361	100.0	4,192	100.0
Electrolytic	94,843	28.5	3,730	89.0
Other processes	238,518	71.5	462	11.0

Electrolytic and electrothermic products may be subdivided into four principal groups: (1) Chlorine and its derivatives, together with caustic alkalies which are interdependent or by-products of great importance; (2) oxygen and hydrogen, which are also produced simultaneously; (3) elements or metals and their alloys, including carbides; and (4) organic products and salts other than the foregoing, including cyanides, chlorates, carbon bisulphide and persulphates. The first two are electrolytic, the third electrothermic, and the fourth may be either.

The value of the products produced by the aid of electricity in 1919, shows an increase of 178 per cent over the production as reported in 1914, the per cent of increase for the preceding periods being 61 per cent for 1909–1914, 161 per cent for 1904–1909, and 246 per cent for the period 1899–1904.

The nine leading states in 1919, in order of value of electro products, were New York, Michigan, North Carolina, New Jersey, Tennessee, Pennsylvania, West Virginia, Virginia, and California, which altogether produced 96.3 per cent of the total value of products. The remaining 3.7 per cent was distributed among 24 states.

Chlorine and hypochlorites have been considered in detail under Group VI; hydrogen and oxygen under Group IX, and sodium and potassium hydroxide under their respective Groups III and IV.

The item of other commodities may be subdivided as follows: Metals and alloys or basic elements, including aluminum, iron, tungsten, molybdenum, sodium, vanadium, magnesium, copper, and manganese and their alloys, $36,000,000; abrasives and carbides, $22,000,000; salts and organic products such as cyanides, chlorates, persalts and carbon bisulphide, $6,000,000; and negative elements and their derivatives, phosphorus, bromine, silicon, and hydrochloric acid, $1,000,000.

GENERAL TABLES.

Comparative summary, by states.—Table 35 gives the comparative statistics for the principal items, number of establishments, average number of wage earners, primary horsepower, cost of materials, and value of products for the census years 1919, 1914, and 1909.

Detailed statement, by states.—Table 36 is a detailed statement, by states, for the census of 1919.

TABLE 35.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	598	55,586	376,940	$72,848	$216,301	$438,659
	1914	395	32,311	282,385	22,066	89,451	158,054
	1909	359	23,729	208,657	14,096	64,146	227,741
California	1919	49	1,466	15,980	1,974	6,131	10,539
	1914	20	257	1,521	184	933	1,524
	1909	13	244	1,308	168	762	1,306
Illinois	1919	33	3,004	23,393	3,836	12,003	22,061
	1914	26	1,682	8,590	1,164	5,360	8,618
	1909	22	843	5,917	536	2,915	4,683
Massachusetts	1919	27	2,483	9,223	3,044	8,101	17,305
	1914	24	1,395	5,405	955	3,355	6,685
	1909	24	1,358	3,731	811	3,048	5,916
Michigan	1919	36	5,712	74,943	8,950	15,744	37,851
	1914	36	4,509	45,944	3,405	6,373	13,891
	1909	[1] 36	3,174	26,594	2,012	5,072	12,890
Missouri	1919	22	1,253	4,149	1,162	7,717	13,538
	1914	22	842	1,764	498	4,164	6,936
	1909	[2] 9	619	886	333	2,224	3,640
New Jersey	1919	78	12,472	36,807	14,904	45,174	84,034
	1914	64	6,276	18,503	4,124	17,054	31,687
	1909	50	5,046	13,880	2,895	12,257	22,824
New York	1919	88	9,687	59,043	$13,149	$50,871	$88,102
	1914	70	7,780	131,928	5,380	26,252	42,877
	1909	74	5,746	116,197	3,376	19,709	35,346
Ohio	1919	37	3,670	35,049	5,473	15,296	32,719
	1914	29	2,017	18,751	1,460	6,726	11,388
	1909	33	1,132	11,715	749	4,748	7,742
Pennsylvania	1919	56	7,134	30,334	9,854	26,781	73,333
	1914	39	4,748	16,570	2,928	12,615	22,388
	1909	[1] 37	3,185	9,771	1,892	10,200	15,978
Washington	1919	8	90	1,105	123	536	1,363
	1914	4	32	89	25	259	374
Wisconsin	1919	30	187	1,376	204	1,129	2,074
	1914	7	60	362	36	230	436
	1909	5	76	495	41	242	513
All other states	1919	134	8,428	85,478	10,175	26,818	55,740
	1914	54	2,713	32,898	1,907	6,130	11,250
	1909	56	2,308	18,163	1,283	2,909	6,903

[1] Excludes statistics for 1 establishment, to avoid disclosure of individual operations.
[2] Excludes statistics for 2 establishments, to avoid disclosure of individual operations.

TABLE 36.—DETAILED STATEMENT,

	STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male.	Under 16. Female.	Capital.
																Dollars.
1	United States	598	66,947	122	2,905	5,460	2,874	55,586	Ja 60,754	My 51,050	58,757	53,798	4,782	88	89	484,488,412
2	California	49	1,762	10	85	128	73	1,466	Ja 1,886	Je 1,273	1,288	1,266	21	1	.....	25,483,943
3	Colorado	7	138	3	16	14	7	98	Oc 125	Ja [3] 89	105	104	1	.....	.....	1,337,606
4	Georgia	7	182	.....	11	52	12	107	Jy 126	Ja 90	92	90	2	.....	.....	1,169,583
5	Illinois	33	3,554	14	128	274	134	3,004	Oc 3,544	Ap 2,570	3,248	3,200	48	.....	.....	19,923,193
6	Indiana	9	1,305	.....	32	176	71	1,026	Ja 1,244	Je 827	1,008	990	14	4	.....	7,466,016
7	Iowa	5	103	.....	14	12	5	72	Je 109	Ap 32	104	100	4	.....	.....	1,081,227
8	Kentucky	4	29	1	3	6	6	13	Ja [3] 14	Au 11	14	14	.....	.....	.....	157,778
9	Louisiana	5	87	2	6	16	9	54	Fe [3] 62	Oc [3] 47	63	60	2	1	.....	887,824
10	Maryland	8	950	.....	30	92	31	797	No 975	Ja 651	784	773	11	.....	.....	7,890,204
11	Massachusetts	27	3,054	10	142	235	184	2,483	De 2,729	Mh 2,329	2,731	2,150	571	2	8	16,319,388
12	Michigan	36	6,721	14	314	492	189	5,712	Ja 7,494	My 4,980	5,999	5,938	53	8	.....	62,841,234
13	Minnesota	9	281	.....	18	67	34	162	Je 195	Ja 98	185	185	.....	.....	.....	2,082,618
14	Missouri	22	1,826	5	112	255	201	1,253	Je 1,280	Mh 1,218	1,245	998	239	6	2	9,309,265
15	Nebraska	12	370	2	30	22	16	300	Ja 792	Jy 48	539	530	9	.....	.....	6,569,155
16	New Jersey	78	15,002	9	667	1,165	740	12,472	De 13,127	Ap 11,277	13,099	12,085	990	14	10	90,993,211
17	New York	88	11,780	17	581	1,042	453	9,687	Ja 11,461	Je 8,920	9,864	9,299	560	5	.....	91,909,454
18	Ohio	37	4,410	1	178	357	204	3,670	Oc 4,210	Ap 3,022	4,296	4,012	283	1	.....	26,764,298
19	Pennsylvania	56	8,167	5	214	539	275	7,134	De 7,633	Mh 6,602	7,656	6,065	1,508	27	56	52,354,008
20	Rhode Island	4	299	.....	9	1	2	287	Au 319	Ja 256	298	272	26	.....	.....	1,297,118
21	Texas	9	249	.....	22	60	17	150	Oc 169	Ja 123	165	149	4	12	.....	2,139,701
22	Utah	8	504	.....	19	22	9	454	Mh 547	Je 342	559	552	7	.....	.....	3,063,947
23	Virginia	12	2,040	1	78	72	42	1,847	No 2,118	Mh 1,544	1,996	1,602	382	1	11	13,885,365
24	Washington	8	164	.....	26	27	21	90	De 108	Ap [3] 76	108	108	.....	.....	.....	1,461,509
25	West Virginia	7	599	.....	41	21	3	534	Oc 635	My 452	495	491	4	.....	.....	8,631,079
26	Wisconsin	30	317	19	42	49	20	187	Ja 219	Jy 169	204	191	12	1	.....	2,139,671
27	All other states [4]	28	2,994	9	87	264	107	2,527	.....	.....	2,612	2,574	31	5	2	27,330,017

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

BY STATES: 1919.

EXPENSES.								Value of products.	Value added by manufacture.	POWER.							
Salaries and wages.			For contract work.	Rent and taxes.		For materials.				Primary horsepower.						Electric horsepower generated in establishments reporting.	
											Owned.						
Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.[1]	Rented.[2]		
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*								
12,546,127	11,794,507	72,848,324	1,321,738	596,741	31,931,389	183,558,969	32,742,310	438,658,869	222,357,590	376,940	127,164	114,585	5,004	3,692	126,495	109,554	1
233,367	255,686	1,973,938	27,885	10,289	233,679	4,830,172	1,300,728	10,539,416	4,408,516	15,980	1,437	2,790	80	.....	11,673	417	2
46,193	24,178	101,348	113,617	3,296	35,531	590,402	43,381	1,301,141	667,358	788	40	.....	.....	2	746	.....	3
41,624	94,019	104,165	.....	10,600	60,545	323,907	55,853	957,293	577,533	547	150	.....	.....	.....	397	10	4
761,867	573,883	3,836,506	58,941	55,960	647,408	10,408,691	1,594,383	22,060,803	10,057,729	23,393	16,613	2,743	50	1	3,985	24,550	5
192,862	364,575	1,732,093	.....	1,440	381,077	3,378,886	591,716	8,649,304	4,678,702	8,574	6,696	180	210	.....	1,488	698	6
25,194	21,694	76,927	.....	.....	17,068	250,669	70,076	558,084	237,339	834	225	.....	.....	.....	609	.....	7
7,820	9,374	14,619	.....	780	7,313	50,398	13,551	177,018	113,069	359	100	.....	.....	.....	259	.....	8
19,680	28,221	64,288	2,500	1,344	30,916	32,537	48,182	312,806	232,087	402	85	.....	.....	.....	317	.....	9
204,211	152,122	1,090,437	.....	3,600	71,286	2,815,529	382,629	5,277,426	2,079,268	6,568	1,435	3,425	10	.....	1,698	3,439	10
475,417	457,835	3,043,576	3,587	30,402	738,198	7,561,738	539,679	17,305,166	9,203,749	9,223	2,565	3,225	175	1	3,257	3,064	11
1,121,081	957,786	8,949,577	1,940	20,950	2,399,240	9,292,541	6,451,534	37,850,834	22,106,759	74,943	22,710	37,237	22	100	14,874	20,541	12
58,107	126,364	188,223	.....	51,732	60,572	484,624	138,908	1,455,658	832,126	1,105	75	.....	100	.....	930	10	13
386,977	559,820	1,162,182	.....	49,162	1,093,445	7,429,292	287,533	13,537,929	5,821,104	4,149	1,767	.....	.....	.....	2,382	1,020	14
90,379	51,457	399,593	.....	7,892	22,121	514,314	455,298	2,304,793	1,335,181	6,057	4,381	750	722	.....	204	1,182	15
3,122,104	2,753,623	14,903,510	804,679	55,900	3,060,252	42,169,606	3,003,988	84,033,941	38,860,347	36,807	18,201	9,923	1,088	.....	7,595	16,867	16
2,807,754	2,352,144	13,148,889	33,828	142,664	5,413,813	42,601,366	8,270,026	88,101,532	37,230,140	59,043	16,445	7,871	188	2,688	31,851	9,786	17
693,141	742,760	5,473,508	45,874	34,695	1,740,048	12,146,385	3,149,144	32,719,466	17,423,937	35,049	13,838	16,320	433	20	4,438	10,076	18
1,190,401	1,191,699	9,854,310	95,369	18,496	12,076,417	24,723,050	2,058,100	73,332,932	46,551,782	30,334	9,741	5,557	400	.....	14,636	8,578	19
35,673	4,779	335,240	.....	1,335	21,823	851,605	93,815	1,399,346	453,926	886	295	.....	.....	.....	591	167	20
57,294	106,398	155,749	12,667	6,188	67,144	486,781	85,581	1,394,354	821,992	1,057	291	.....	.....	.....	766	5	21
44,161	64,054	658,925	93,038	3,000	31,001	551,067	235,524	1,708,957	922,366	4,735	2,119	714	493	500	909	320	22
238,204	166,410	1,942,627	.....	7,405	2,838,916	2,736,939	968,469	12,765,281	9,059,873	11,862	4,240	2,900	.....	.....	4,722	5,300	23
69,473	64,637	123,135	.....	2,334	128,673	469,069	66,825	1,363,434	827,540	1,165	40	.....	8	.....	1,117	.....	24
181,747	46,188	752,936	.....	.....	115,411	1,896,082	225,785	3,280,657	1,158,190	8,425	1,330	5,850	655	.....	590	1,520	25
80,214	96,029	204,095	1,170	5,147	60,002	1,063,995	65,378	2,074,299	944,926	1,376	140	.....	10	.....	1,226	4	26
311,182	528,672	2,557,928	15,643	72,130	579,490	5,898,724	2,546,224	14,196,999	5,752,051	33,279	2,205	15,100	360	380	15,234	1,400	27

[1] All other states embrace: Alabama, 2 establishments; Arkansas, 2; Connecticut, 3; District of Columbia, 1; Kansas, 4; Maine, 2; Montana, 2; North Carolina, 1; Oklahoma, 2; Oregon, 1; South Dakota, 1; Tennessee, 5; and Wyoming, 2.

SULPHURIC, NITRIC, AND MIXED ACIDS.

GENERAL STATISTICS.

General character of the industry.—The statistics for establishments engaged primarily in the manufacture of sulphuric, nitric, and mixed acids were first presented separately at the census of 1904. Prior thereto they were included in the general chemical industry. It is to a considerable extent a specialized branch of the chemical industry, and the statistics here presented embrace the establishments specializing in the production of these acids.

Comparative summary.—Table 37 presents the comparative statistics for the industry for the census years 1899 to 1919, inclusive, the reports for 1899 having been segregated from chemicals in general.

Principal states, ranked by value of products.—Table 38 shows the number of establishments, wage earners, value of products, and value added by manufacture, by states, ranked according to value of products in 1919.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 39 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 47.

Wage earners, by months.—The statistics for wage earners, Table 40, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. A few females were reported as wage earners, but they constituted only one-half of 1 per cent of the total number.

Prevailing hours of labor.—The statistics in Table 41 show a relatively large per cent of the employees in establishments where the prevailing hours of labor per week were 60 and over, though the percentage has dropped from 88.7 per cent in 1909 and 79.8 in 1914 to 18 per cent in 1919. In 1914 and 1909 practically no establishments operated on less than a 54-hour per week schedule, the few reported in 1914 on a 48-hour basis being negligible, but in 1919, 33 per cent were employed in establishments where the prevailing hours were 48 per week.

Size of establishments, by average number of wage earners.—The industry is one of relatively large units, as shown in Table 42, the average number of wage earners per establishment being 96 in 1914 and 127 in 1919, a moderate increase in average size. In 1919 the establishments employing over 100 wage earners included 64.1 per cent of the total number of establishments and reported 93.9 per cent of the wage earners, as compared with 53.1 per cent of the establishments and 85.4 per cent of the wage earners in 1914.

Size of establishments, by value of products.—The grouping by value of products as shown in Table 43, reflects the general increase in values. The average value of products per establishment increased from $235,000 in 1909 to $475,000 in 1914 and to $807,000 in 1919, but the increase is to a large degree due to high prices. This condition accounts for the changes from lower to higher groups.

Character of ownership.—The establishments in this branch of the chemical industry were all owned by corporations in 1919, and likewise in 1914 and 1909.

Number and horsepower of types of prime movers.—Table 44 presents the power statistics for the industry for 1919, 1914, and 1909. Electric power is a growing factor, and of the total primary power 91.7 per cent was 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 52.1 per cent in 1914 and 34.3 per cent in 1909.

Fuel consumed.—Table 45 presents the statistics for fuel, by kinds and by states, for 1919 and 1914. The figures for gas include both natural and manufactured gas.

TABLE 37.—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	39	32	42	32	34	21.9	−23.8	31.2	−5.9
Persons engaged	5,860	3,604	2,582	2,757	2,654	62.6	39.6	−6.3	3.9
Proprietors and firm members	.....	.....	.....	2	(2)	.....	.....	.....	.....
Salaried employees	899	540	330	308	298	66.5	63.6	7.1	3.4
Wage earners (average number)	4,961	3,064	2,252	2,447	2,356	61.9	36.1	−8.0	3.9
Primary horsepower	30,637	24,927	6,494	5,416	(2)	22.9	284.5	19.9	.....
Capital	$51,160,004	$35,233,806	$18,726,195	$12,761,920	$13,981,506	45.2	88.2	46.7	−8.7
Salaries and wages	10,096,048	3,082,747	2,045,894	2,061,512	1,715,895	228.0	50.7	−0.8	20.1
Salaries	2,179,517	870,200	551,000	556,106	388,346	150.0	57.9	−0.9	43.2
Wages	7,916,531	2,212,547	1,494,894	1,505,406	1,327,549	258.0	48.0	−0.7	13.4
Paid for contract work	47,867	6,315	212	7,839	(2)	658.0	.....	.....	.....
Rent and taxes	1,071,605	217,278	90,145	[3] 102,023	(2)	393.0	141.0	.....	.....
Cost of materials	15,857,361	6,734,428	5,385,828	4,972,838	4,033,238	136.0	25.0	8.3	23.3
Value of products	31,470,480	15,215,474	9,884,057	9,052,646	8,596,390	107.0	53.9	9.2	5.3
Value added by manufacture [4]	15,613,119	8,481,046	4,498,229	4,079,808	4,563,152	84.1	88.5	10.3	−10.6

[1] A minus sign (−) denotes decrease. [2] Figures not available. [3] Exclusive of internal revenue. [4] Value of products less cost of materials.

TABLE 38.—PRINCIPAL STATES, RANKED BY VALUE OF PRODUCTS: 1919.

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	39	4,961	100.0	.....	$31,470	100.0	.....	$15,613	100.0	.....
California	4	576	11.6	3	5,440	17.3	1	3,381	21.7	1
Illinois	3	875	17.6	1	5,057	16.1	3	2,829	18.1	2
New Jersey	5	561	11.3	4	2,804	8.9	4	1,208	7.7	6
New York	3	398	8.0	5	2,670	8.5	5	1,416	9.1	4
All other states	24	2,551	51.4	.....	15,499	49.2	.....	6,779	43.4	.....

TABLE 39.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	5,860	5,627	233	96.0	4.0
	1914	3,604	3,528	76	97.9	2.1
	1909	2,582	2,547	35	98.6	1.4
Proprietors and officials [1]	1919	294	285	9	96.9	3.1
	1914	135	135	.....	100.0	.....
	1909	106	106	.....	100.0	.....
Salaried officers of corporations	1919	40	40	.....	100.0	.....
	1914	35	35	.....	100.0	.....
	1909	27	27	.....	100.0	.....
Superintendents and managers	1919	254	245	9	96.5	3.5
	1914	100	100	.....	100.0	.....
	1909	79	79	.....	100.0	.....
Clerks and other subordinate salaried employees	1919	605	407	198	67.3	32.7
	1914	405	330	75	81.5	18.5
	1909	224	190	34	84.8	15.2
Wage earners (average number)	1919	4,961	4,935	26	99.5	0.5
	1914	3,064	3,063	1	100.0	(2)
	1909	2,252	2,251	1	100.0	(2)
16 years of age and over	1919	4,959	4,933	26	99.5	0.5
	1914	3,064	3,063	1	100.0	(2)
	1909	2,249	2,248	1	100.0	(2)
Under 16 years of age	1919	2	2	.....	100.0	.....
	1914	.....	.....	.....	.....	.....
	1909	3	3	.....	100.0	.....

[1] No proprietors; officials only. [2] Less than one-tenth of 1 per cent.

TABLE 40.—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	4,961	5,529	5,301	4,690	4,438	4,446	4,415	*4,331*	4,893	4,932	5,425	5,368	5,764	75.1
Males	4,935	5,487	5,265	4,670	4,422	4,384	4,400	*4,314*	4,878	4,916	5,404	5,343	5,737	75.2
Females	26	42	36	20	16	62	*15*	17	*15*	16	21	25	27	24.2
1914	3,064	*2,858*	2,903	2,900	2,898	2,926	3,007	2,952	3,090	3,049	3,312	3,346	3,527	81.0
1909	2,252	2,227	2,191	2,212	*2,129*	2,279	2,246	2,300	2,213	2,291	2,327	2,288	2,315	91.5
California	576	613	670	634	597	636	566	547	501	508	588	*494*	498	73.7
Illinois	875	927	878	804	*771*	727	811	852	939	922	1,008	1,000	921	70.5
New Jersey	561	600	587	596	*534*	567	*534*	544	562	550	542	554	562	89.0
New York	398	431	402	395	360	361	359	*352*	392	407	439	436	442	79.6

TABLE 41.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED STATES: 1919.

STATE.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—					
		48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States 1919	4,961	1,635	981	.....	1,454	198	693
1914	3,064	11	.....	229	379	490	1,955
1909	2,252	.....	.....	203	51	555	1,443
California	576	212	.....	.....	364	.....	.....
Illinois	875	432	.....	.....	443	.....	.....
New Jersey	561	497	.....	.....	.....	10	54
New York	398	154	.....	.....	.....	188	56

TABLE 42.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—													
			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.	
	Establishments.	Wage earners (average number.)	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States 1919	39	4,961	1	1	7	97	6	206	8	521	12	1,953	4	1,371	1	812
1914	32	3,064	.....	.....	5	64	10	381	5	405	10	1,571	2	643	.....	.....
California	4	576	.....	.....	1	8	1	40	.....	.....	1	164	1	364	.....	.....
Illinois	3	875	.....	.....	.....	.....	.....	.....	.....	.....	1	134	2	741	.....	.....
New Jersey	5	561	.....	.....	1	10	.....	.....	1	54	3	497	.....	.....	.....	.....
New York	3	398	.....	.....	.....	.....	.....	.....	1	56	2	342	.....	.....	.....	.....

TABLE 43.—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	39	32	42	4,961	3,064	2,252	$31,470,480	$15,215,474	$9,884,057	$15,613,119	$8,481,046	$4,498,229
Less than $5,000	.....			.....			.....			.....		
$5,000 to $20,000	2	6	21	9	104	303	27,362	291,993	1,239,949	15,425	131,082	536,393
$20,000 to $100,000	4			74			312,759			88,247		
$100,000 to $500,000	12	15	21	535	2,017	1,949	3,103,303	3,783,058	8,644,108	1,488,968	4,054,349	3,961,836
$500,000 to $1,000,000	12	6		1,396			8,713,923	4,060,707		3,878,780		
$1,000,000 and over	9	5	.....	2,947	943	.....	19,313,133	7,079,716	.....	10,141,699	4,295,615	.....
	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	.....			.....			.....			.....		
$5,000 to $20,000	5.1	18.8	50.0	0.2	3.4	13.5	0.1	1.9	12.5	0.1	1.6	11.9
$20,000 to $100,000	10.3			1.5			1.0			0.6		
$100,000 to $500,000	30.8	46.8	50.0	10.8	65.8	86.5	9.9	24.9	87.5	9.5	47.8	88.1
$500,000 to $1,000,000	30.8	18.8		28.1			27.7	26.7		24.8		
$1,000,000 and over	23.1	15.6	.....	59.4	30.8	.....	61.4	46.5	.....	65.0	50.6	.....

TABLE 44.—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	938	312	254	30,637	24,927	6,494	100.0	100.0	100.0
Owned	143	155	184	14,452	18,621	5,454	47.2	74.7	84.0
Steam [1]	127	137	176	12,672	17,096	5,083	41.4	68.6	78.3
Engines	107	(2)	(2)	8,737	(2)	(2)	28.5	.....	.....
Turbines	20	(2)	(2)	3,935	(2)	(2)	12.8	.....	.....
Internal-combustion engines	15	18	8	1,755	1,525	371	5.7	6.1	5.7
Water wheels and turbines	1	.....	.....	25	.....	.....	0.1	.....	.....
Rented	795	157	70	16,185	6,306	1,040	52.8	25.3	16.0
Electric	795	157	70	16,381	2,381	878	52.8	9.6	13.5
Other	.....	.....	.....	.....	3,925	162	.....	15.7	2.5
Electric	1,509	726	195	28,091	12,994	2,230	.....	100.0	100.0
Rented	795	157	70	16,185	2,381	878	57.6	18.3	39.4
Generated by establishments reporting	714	569	125	11,906	10,613	1,352	42.4	81.7	60.6

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

TABLE 45.—FUEL CONSUMED, BY STATES: 1919.

STATE.		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	52,865	259,615	6,563	179,466	250	198,953
	1914	69,645	184,393	1,547	32,709	(1)	283,952
California		.....	.....	.....	114,696	.....	11,643
Illinois		.....	59,405	.....	12,834	.....	.....
New Jersey		39,168	14,752	35	34,355	.....	.....
New York		13,368	5,950	11	2,091	.....	.....
All other states		329	179,502	6,517	15,490	250	185,310

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Establishments.—The special statistics for sulphuric, nitric, and mixed acids are given in detail in the section of this report pertaining to chemicals in Tables 15 to 22, which include figures for the entire industry.

There were 39 establishments in 1919 and 32 in 1914 that manufactured these acids as their chief product.

Materials.—The consumption of sulphur, pyrite, and nitrate of soda in the manufacture of these acids was not reported separately. The total consumption of these materials by all chemical establishments is given in Table 13 of the section on chemicals.

Products.—In the acid industry the total production of sulphuric acid in 1919, expressed in terms of 50° Baumé was 5,552,581 tons, compared with 4,071,566 tons in 1914, an increase of 36.4 per cent. The production of nitric acid in 1919 amounted to 86,992 tons, as compared with 78,589 tons in 1914, an increase of 10.7 per cent; and mixed acid to 114,886 tons in 1919 and 112,124 tons in 1914, an increase of 2.5 per cent.

GENERAL TABLES.

Comparative summary, by states.—Table 46 gives the comparative statistics for the principal items, number of establishments, average number of wage earners, primary horsepower, cost of materials, and value of products, for the census years 1919, 1914, and 1909.

Detailed statement, by states.—Table 47 is a detailed statement, by states, for the census of 1919.

TABLE 46.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	39	4,961	30,637	$7,917	$15,857	$31,470
	1914	32	3,064	24,927	2,213	6,734	15,215
	1909	42	2,252	6,494	1,495	5,386	9,884
New Jersey	1919	5	561	1,151	876	1,596	2,804
	1914	6	909	3,409	697	2,160	5,071
	1909	6	434	1,575	282	1,062	2,128
All other states	1919	34	4,400	29,486	$7,041	$14,261	$28,666
	1914	26	2,155	21,518	1,516	4,574	10,144
	1909	36	1,818	4,919	1,213	4,324	7,756

TABLE 47.—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.	16 and over.		Under 16.			Salaries and wages.	
					Male.	Female.	Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.		Male.	Female.	Male.	Female.		Officials.	Clerks, etc.
United States	39	5,860	.....	294	407	198	4,961	De 5,764	Jy 4,331	5,890	5,862	26	2	.....	$51,160,004	$1,247,633	$931,884
California	4	708	.....	40	63	29	576	Fe 670	No 494	498	497	1	.....	.....	6,183,172	201,607	146,029
Illinois	3	1,032	.....	32	81	44	875	Oc 1,008	Ap 711	920	918	2	.....	.....	7,577,182	182,464	181,271
New Jersey	5	621	.....	24	30	6	561	Ja 600	Je 534	575	574	.....	1	.....	4,516,783	75,118	71,275
New York	3	468	.....	31	23	16	398	De 442	Jy 352	440	437	2	1	.....	3,033,642	120,063	65,635
All other states [1]	24	3,031	.....	167	210	103	2,551	.....	.....	3,457	3,436	21	.....	.....	29,844,225	668,381	467,674

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 horsepower generated in establishments reporting.
										Owned.				Rented electric.	
	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.[2]		
United States	$7,916,531	$47,867	$47,396	$1,024,209	$13,735,042	$2,122,319	$31,470,480	$15,613,119	30,637	8,737	3,935	1,755	25	16,185	11,906
California	1,053,015	7,612	.....	298,037	1,798,416	260,682	5,440,334	3,381,236	5,254	25	1,115	.....	.....	4,114	109
Illinois	1,478,766	.....	.....	168,506	1,898,106	329,830	5,056,584	2,828,639	6,056	1,970	.....	.....	.....	4,086	.....
New Jersey	875,409	.....	.....	123,949	1,265,804	329,951	2,803,976	1,208,221	1,151	639	320	.....	.....	192	566
New York	574,293	32,255	.....	15,470	1,128,164	126,149	2,670,210	1,415,897	1,366	125	.....	.....	25	1,216	.....
All other states [1]	3,935,048	8,000	47,396	418,197	7,644,552	1,075,698	15,499,376	6,779,126	16,810	5,978	2,500	1,755	.....	6,577	11,231

[1] All other states embrace: Alabama, 1 establishment; Arkansas, 1; Colorado, 2; Connecticut, 1; Delaware, 1; Kansas, 1; Louisiana, 1; Maryland, 1; Massachusetts, 1; Ohio, 5; Oklahoma, 1; Pennsylvania, 4; Tennessee, 1; Texas, 1; Utah, 1; and Virginia, 1.

[2] Includes water wheels and turbines (irrespective of ownership of water supply).

COAL-TAR PRODUCTS.

GENERAL STATISTICS.

At prior censuses the coal-tar industry has been carried as a group of the general chemical industry. Comparative figures, therefore, with respect to the general statistics are not available, as the establishments at the census of 1914 and prior censuses were included with other chemical establishments.

Principal states, ranked by value of products.—Table 48 presents certain general statistics, namely, number of establishments, average number of wage earners, value of products, and value added by manufacture for states, ranked according to value of products. In this and other tables certain states which are substantial producers of these products can not be shown separately and are included in the group of "All other states."

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 49 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 57.

Wage earners, by months.—The statistics for wage earners by months, Table 50, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Females constituted but 3.5 per cent of the total number of wage earners employed.

Prevailing hours of labor.—Comparative figures are not available to show the movement toward shorter hours of labor, but the distribution of the wage earners by hour groups in this branch of the chemical industry is in harmony with conditions in other lines of chemical products. In 1919, as shown in Table 51, only 11.3 per cent of the total number of wage earners were employed in establishments where the prevailing hours of labor per week were 60 or over, the corresponding percentage in the general chemical industry being 13.9 per cent. In like manner 40.4 per cent of the wage earners were employed in establishments operating on a basis of 48 hours per week or less in this branch of the industry, as compared with 38.4 per cent in the general chemical industry.

Size of establishments, by average number of wage earners.—Table 52 shows that the industry includes some large units. The average number of wage earners per establishment was 86, but 56.6 per cent of the wage earners were reported by 8 establishments, each of which employed in excess of 500 wage earners.

Size of establishments, by value of products.—The average value of products per establishment, Table 53, was $740,000, as compared with $734,000 for establishments in the general chemical industry. The group, "$1,000,000 and over," carrying 14.2 per cent of the establishments, reported 76.1 per cent of the wage earners and 76.1 per cent of the value of products.

Character of ownership.—Table 54 presents the general statistics for the establishments, classified by character of ownership. Corporations embraced 91.8 per cent of the establishments and accounted for 98.9 per cent of the wage earners and the value of products.

Number and horsepower of types of prime movers.—Table 55 presents the statistics concerning power. Of the total primary power, 40.1 per cent was purchased power, and of the owned power the bulk of the capacity was utilized in electric generation. As a result 78.6 per cent of the primary power rated capacity is represented by electric-power equipment, either operated with purchased or rented current or with generated current.

Fuel consumed.—Table 56 presents the statistics for fuel, by kind and by states. The gas reported includes both natural and manufactured gas.

TABLE 48.—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	183	15,663	100.0	.....	$135,482	100.0	.....	$71,485	100.0	.....
New York	46	3,758	24.0	2	45,792	33.8	1	31,409	444.0	1
New Jersey	48	6,495	41.5	1	44,741	33.0	2	20,480	28.6	2
Ohio	15	834	5.3	4	9,495	7.0	3	4,105	5.8	3
Pennsylvania	19	1,333	8.5	3	9,492	7.0	4	3,283	4.6	5
Wisconsin	5	827	5.3	5	4,983	3.7	6	2,737	3.8	6
Massachusetts	8	444	2.8	7	3,957	3.0	7	1,485	2.1	7
Illinois	9	186	1.2	10	2,075	1.6	8	1,028	1.4	8
All other states	33	1,786	11.4	.....	14,947	11.0	.....	6,958	9.7	.....

TABLE 49.—PERSONS ENGAGED IN THE INDUSTRY: 1919.

CLASS.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	21,543	19,813	1,730	92.0	7.0
Proprietors and officials	1,784	1,762	22	98.7	1.3
Proprietors and firm members	26	23	3	88.5	11.5
Salaried officers of corporations	235	230	5	98.0	2.0
Superintendents and managers	1,523	1,509	14	99.1	0.9
Clerks and other subordinate salaried employees	4,096	2,931	1,165	71.5	28.5
Wage earners (average number)	15,663	15,120	543	96.5	3.5
16 years of age and over	15,637	15,107	530	96.6	3.4
Under 16 years of age	26	13	13	50.0	50.0

TABLE 50.—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. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States	15,663	15,967	15,323	14,695	*14,311*	14,539	14,699	14,501	15,827	16,365	16,760	17,082	17,887	80.0
Males	15,120	15,319	14,742	14,173	*13,794*	14,040	14,193	14,027	15,312	15,815	16,192	16,507	17,326	79.6
Females	543	648	581	522	517	499	506	*474*	515	550	568	575	561	73.1
Illinois	186	180	170	*169*	175	182	198	196	206	194	187	189	186	82.0
Massachusetts	444	399	407	*366*	371	433	422	440	456	480	495	524	535	68.4
New Jersey	6,495	6,084	*5,589*	5,822	6,165	6,459	6,487	5,970	6,943	7,010	7,017	7,118	7,276	76.8
New York	3,758	4,377	4,440	4,067	3,411	*3,228*	3,282	3,374	3,432	3,601	3,814	3,889	4,181	72.7
Ohio	834	858	924	811	*711*	739	*711*	768	862	906	914	890	916	77.0
Pennsylvania	1,333	1,650	1,414	1,058	*986*	1,005	1,106	1,267	1,345	1,398	1,562	1,584	1,621	60.0
Wisconsin	827	413	*408*	449	493	619	770	957	1,029	1,118	1,109	1,160	1,399	29.1

TABLE 51.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED STATES: 1919.

STATE.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE— 44 and under.	Between 44 and 48.	48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States	15,663	941	182	5,205	1,589	3,805	2,171	742	1,028
Illinois	186	7	.....	.....	12	30	54	83	.....
Massachusetts	444	.....	.....	132	217	.....	10	.....	85
New Jersey	6,495	.....	21	4,300	254	677	956	228	59
New York	3,758	871	80	134	449	1,545	544	97	38
Ohio	834	.....	26	483	.....	3	306	16	.....
Pennsylvania	1,333	24	38	136	651	37	62	15	370
Wisconsin	827	.....	.....	7	.....	767	.....	49	4

TABLE 52.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED STATES: 1919

STATE.	TOTAL. Establishments.	TOTAL. Wage earners (average number).	ESTABLISHMENTS EMPLOYING— No wage earners. Establishments.	1 to 5 wage earners, inclusive. Establishments.	1 to 5 wage earners, inclusive. Wage earners.	6 to 20 wage earners, inclusive. Establishments.	6 to 20 wage earners, inclusive. Wage earners.	21 to 50 wage earners, inclusive. Establishments.	21 to 50 wage earners, inclusive. Wage earners.	51 to 100 wage earners, inclusive. Establishments.	51 to 100 wage earners, inclusive. Wage earners.	101 to 250 wage earners, inclusive. Establishments.	101 to 250 wage earners, inclusive. Wage earners.	251 to 500 wage earners, inclusive. Establishments.	251 to 500 wage earners, inclusive. Wage earners.	501 to 1,000 wage earners, inclusive. Establishments.	501 to 1,000 wage earners, inclusive. Wage earners.	Over 1,000 wage earners. Establishments.	Over 1,000 wage earners. Wage earners.
United States	183	15,663	3	42	142	63	745	28	922	23	1,632	12	2,051	4	1,306	6	3,862	2	5,003
Illinois	9	186	1	1	1	4	54	2	68	1	63	.....	.....	.....	.....	.....	.....	.....	.....
Massachusetts	8	444	.....	1	4	3	30	.....	.....	2	143	2	267	.....	.....	.....	.....	.....	.....
New Jersey	48	6,495	.....	9	45	17	197	6	183	8	604	5	839	1	37	1	702	1	3,555
New York	46	3,758	.....	15	51	15	182	6	203	5	337	2	427	.....	.....	2	1,110	1	1,448
Ohio	15	834	.....	5	12	1	8	4	134	3	197	1	168	1	315	.....	.....	.....	.....
Pennsylvania	19	1,333	1	3	5	9	125	3	99	1	89	.....	.....	1	370	1	645	.....	.....
Wisconsin	5	827	.....	1	4	2	21	1	35	.....	.....	.....	.....	.....	.....	1	767	.....	.....

TABLE 53.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS: 1919.

VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Valu added by manufacture.
All classes	183	15,663	$135,482,161	$71,485,427	Per cent distribution	100.0	100.0	100.0	100.0
Less than $5,000	13	17	34,260	1,555	Less than $5,000	7.1	0.1	(1)	(1)
$5,000 to $20,000	12	52	129,907	41,853	$5,000 to $20,000	6.6	0.5	0.1	0.1
$20,000 to $100,000	51	484	2,916,966	1,067,874	$20,000 to $100,000	27.8	3.1	2.1	1.5
$100,000 to $500,000	21	1,453	14,076,538	5,229,609	$100,000 to $500,000	11.5	9.3	10.4	7.3
$500,000 to $1,000,000	60	1,740	15,259,506	6,146,674	$500,000 to $1,000,000	32.8	11.1	11.3	8.6
$1,000,000 and over	26	11,917	103,064,984	58,997,862	$1,000,000 and over	14.2	76.1	76.1	82.5

[1] Less than one-tenth of 1 per cent.

TABLE 54.—CHARACTER OF OWNERSHIP: 1919.

CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.
Total	183	15,663	$135,482,161	Per cent of total:			
Individual	9	70	397,313	Individual	4.9	0.5	0.3
Corporation	168	15,496	133,976,720	Corporation	91.8	98.9	98.9
All other	6	97	1,108,128	All other	3.3	0.6	0.8

TABLE 55.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919.

POWER.	Number of engines or motors.	HORSEPOWER.		POWER.	Number of engines or motors.	HORSEPOWER.	
		Amount.	Per cent distribution.			Amount.	Per cent distribution.
Primary power, total	2,549	68,342	100.0	Primary power, total—Continued.			
Owned	387	40,963	59.9	Rented	2,162	27,379	40.1
Steam	373	40,698	59.6	Electric	2,162	27,376	4.01
Engines	334	24,310	35.6	Other	.....	3	.....
Turbines	39	16,388	24.0	Electric	5,507	53,693	100.0
Internal-combustion engines	14	265	0.3	Rented	2,162	27,376	51.0
				Generated by establishments reporting	3,345	26,317	49.0

TABLE 56.—FUEL CONSUMED, BY STATES: 1919.

STATE.	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	62,582	721,982	16,855	142,029	1,647	148,004
Illinois	10	15,223	.....	12	230	.....
Massachusetts	802	10,965	2,861	.....	43	3,167
New Jersey	45,472	265,140	195	76,647	205	22,951
New York	11,603	188,783	153	9,620	855	39,345
Ohio	958	46,864	.....	811	.....	7,268
Pennsylvania	3,597	52,925	305	23,379	114	17,962
Wisconsin	.....	35,267	10,409	743	.....	2,000
All other states	140	106,815	2,932	30,817	200	55,311

SPECIAL STATISTICS.

Materials and products.—The value of the products reported for this branch of the chemical industry, $135,482,161, is the value of all products reported by the 183 establishments engaged primarily in the manufacture of coal-tar products. In addition there was a considerable production by establishments classified under other industries. A detailed presentation of products has been given in the section on chemicals, Group VII, coal-tar chemicals.

GENERAL TABLE.

Detailed statement, by states.—Table 57 is a detailed statement, by states, for the census of 1919.

TABLE 57.—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.	16 and over.		Under 16.			Salaries and wages.	
					Male.	Female.	Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.		Male.	Female.	Male.	Female		Officials.	Clerks, etc.
United States	183	21,543	26	1,758	2,931	1,165	15,663	De 17,887	Ap 14,311	18,569	17,991	548	16	14	$174,091,835	$6,540,404	$5,292,665
Illinois	9	260	2	35	24	13	186	Au 206	Mh 169	212	205	7	.....	.....	1,535,599	163,273	45,544
Massachusetts	8	634	1	43	110	36	444	De 535	Mh 366	535	533	1	1	.....	3,718,616	279,755	162,005
New Jersey	48	8,659	1	820	872	471	6,495	De 7,276	Fe 5,589	7,339	7,334	56	2	7	59,092,719	2,796,262	1,848,202
New York	46	5,752	10	421	1,202	361	3,758	Fe 4,440	My 3,228	4,345	3,960	372	11	2	57,269,971	2,089,807	2,193,871
Ohio	15	944	2	62	23	23	834	Fe 924	Je 711	919	912	7	.....	.....	6,693,570	211,077	44,872
Pennsylvania	19	1,938	6	165	297	137	1,333	Ja 1,650	Ap 986	1,622	1,573	47	2	.....	20,225,455	340,449	374,155
Washington	3	36	1	8	.....	1	26	Au[1] 55	Ja 18	21	21	.....	.....	.....	235,088	16,441	5,475
Wisconsin	5	1,064	.....	44	165	28	827	De 1,399	Fe 408	1,399	1,399	.....	.....	.....	5,747,053	235,727	339,830
All other states[2]	30	2,256	3	160	238	95	1,760	.....	.....	2,117	2,054	58	.....	5	20,472,864	407,613	278,711

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.
										Owned.				
	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Rented.	
United States	$23,402,140	$896,830	$782,370	$4,659,741	$59,855,701	$4,141,033	$135,482,161	$71,485,427	68,342	24,310	16,388	265	27,379	26,317
Illinois	269,271	.....	15,456	79,547	991,398	55,741	2,075,368	1,028,229	637	205	.....	35	397	40
Massachusetts	572,177	1,282	12,757	140,836	2,355,083	116,443	3,956,975	1,485,449	1,019	191	.....	12	816	88
New Jersey	10,812,866	235,025	493,347	1,113,444	22,783,812	1,477,061	44,740,496	20,479,623	26,977	8,093	10,080	32	8,772	8,491
New York	4,765,306	627,033	136,359	1,562,711	13,314,115	1,069,220	45,792,118	31,408,783	18,349	9,126	4,275	156	4,792	12,040
Ohio	1,046,539	33,490	23,042	526,693	5,184,305	204,960	9,494,586	4,105,321	4,899	2,387	.....	30	2,482	1,606
Pennsylvania	2,384,077	.....	31,325	214,820	5,777,822	431,863	9,492,331	3,282,646	8,610	1,208	533	.....	6,869	250
Washington	28,373	.....	2,710	4,745	222,218	14,946	367,588	130,424	115	100	.....	.....	15	.....
Wisconsin	1,418,698	.....	5,419	85,058	2,042,606	203,575	4,983,214	2,737,033	3,094	723	1,500	.....	871	1,800
All other states[2]	2,104,833	.....	61,455	932,887	7,184,342	567,224	14,579,485	6,827,919	4,642	2,277	.....	.....	2,365	2,002

[1] Same number reported for one or more other months.
[2] All other states embrace: Alabama, 2 establishments; California, 1; Connecticut, 2; District of Columbia, 1; Georgia, 1; Indiana, 1; Michigan, 4; Minnesota, 2; Missouri, 5; Rhode Island, 2; Tennessee, 2; Utah, 1; Virginia, 3; West Virginia, 3.

COKE.

GENERAL STATISTICS.

General character of the industry.—This industry embraces the establishments engaged primarily in the carbonization of coal, subdivided into (1) the plants equipped with ovens other than retort or by-product ovens, known as beehive ovens, and (2) those using retort or by-product ovens—with a recovery of the products of distillation. The statistics refer to the industry as a whole, except as otherwise stated. It does not include the coke products of the manufactured gas industry, known as gas-house coke, which will be found in the report on manufactured gas.

Comparative summary.—Table 1 presents the statistics for the census years 1899 to 1919 inclusive, with percentages of increase for the census periods, and Table 2 the general statistics for the industry and the two groups, A and B, for the census of 1919.

Principal states, ranked by value of products.—Table 3 shows the number of establishments, wage earners, value of products, and value added by manufacture, by states, ranked according to the value of products in 1919.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 4 is an estimate obtained by the method described in the "Explanation of terms". Figures for states will be found in Table 15.

Wage earners, by months.—The statistics for wage earners, Table 5, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial condition existing during the year. The wage earners employed in the industry are essentially males. Only 8 females were reported.

Prevailing hours of labor.—The comparative statistics for 1919, 1914, and 1909 in Table 6 indicate a movement toward shorter hours of labor per week. In 1909, 64.3 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, 52.1 per cent, while in 1919 this proportion dropped to 45.8 per cent. On the other hand, in 1919, 32.8 per cent were reported for establishments where the prevailing hours of labor were 48 per week or less, compared with 7.5 per cent in 1914 and 6.8 per cent in 1909.

Size of establishments, by average number of wage earners.—The industry is one of relatively large units, the average number of wage earners per establishment being 106 in 1919 and 91 in 1914. In 1919, as shown in Table 7, 10 establishments each employed over 500 wage earners, 33.5 per cent of the total number of wage earners, as compared with 5 establishments which employed 23.8 per cent in 1914.

Size of establishments, by value of products.—The classification by value of products in Table 8 necessarily reflects the general increase in values. The average value of products per establishment increased from $304,000 in 1909 to $430,000 in 1914 and to $1,139,000 in 1919, but the increase in 1919 is due primarily to high prices, for on a quantity basis the production of coke in 1919 was but 28 per cent greater than in 1914 and the wage earners employed were but 39 per cent more than in 1914.

Table 9 shows the distribution of the establishments by value of products for the two industry groups, in 1919. The smaller value groups are confined to the beehive oven group. The average value of products per establishment for this group was $505,000 and for the by-product oven group $3,650,000.

Character of ownership.—Table 10 presents the statistics for establishments classified according to form of ownership. The "Corporations" group employed 97.8 per cent of the wage earners and accounted for the same proportion of the value of products, a slight increase over the percentages for 1914, and the latter were in like manner slightly greater than the percentages for 1909. The 20 individual establishments and the 7 "All others" are beehive oven plants.

Number and horsepower of types of prime movers.—Table 11 presents the power statistics for the establishments. Electric power is employed very extensively, either purchased from hydroelectric companies or from other sources of supply, or generated at the plants. Of the total primary power, 93 per cent was utilized in the form of electric power in 1919, this including electric motor equipment operated with purchased current, specified as rented, and secondary electric or that generated by the establishment. In 1914 the ratio of total electric power to primary power was 73.5 per cent, and in 1909 it was 65.6 per cent.

Fuel consumed.—Table 12 presents the statistics for fuel, by kinds and by states. The figures for bituminous coal include the coal charged into the ovens and used as material, as well as that otherwise used at the plants.

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	278	231	315	278	241	20.3	−26.7	13.3	15.4
Persons engaged	32,882	23,463	31,226	20,440	17,962	40.1	−24.9	52.8	13.8
Proprietors and firm members	41	36	101	73	48	.....	.....	.....	.....
Salaried employees	3,522	2,320	1,852	1,386	915	51.8	25.3	33.6	51.5
Wage earners (average number)	29,319	21,107	29,273	18,981	16,999	38.9	27.9	54.2	11.7
Primary horsepower	224,879	120,327	62,602	66,669	34,767	92.0	87.1	−6.1	91.8
Capital	$365,249,622	$161,561,449	$152,321,337	$90,712,877	$36,502,679	126.0	6.1	67.9	149.0
Salaries and wages	49,905,077	16,945,929	17,526,495	10,552,000	7,883,032	195.0	−3.3	66.1	33.7
Salaries	7,605,785	2,656,977	2,072,150	1,247,502	797,296	186.0	28.2	66.1	56.5
Wages	42,299,292	14,288,952	15,454,345	9,304,498	7,085,736	196.0	−7.5	66.1	31.3
Paid for contract work	81,127	.....	17,929	2,090	56,596	.....	.....	.....	.....
Rent and taxes	9,302,264	1,746,398	579,827	[2] 515,369	[2] 428,774	433.0	.....	.....	.....
Cost of materials	224,266,674	69,138,328	64,024,527	29,884,532	19,665,632	224.0	8.0	114.0	52.0
Value of products	316,515,838	99,275,020	95,696,622	51,728,647	35,585,445	219.0	3.7	85.0	45.4
Value added by manufacture [3]	92,249,164	30,136,692	31,672,095	21,844,115	15,919,913	206.0	−4.8	45.0	37.2

[1] A minus sign (−) denotes decrease. [2] Exclusive of internal revenue. [3] Value of products less cost of materials.

TABLE 2.—THE COKE INDUSTRY, BY INDUSTRY GROUPS: 1919.

	Total for the industry.	Group A—Ovens other than by-product ovens (beehive).	Group B—By-product ovens.	PER CENT OF TOTAL. A	B		Total for the industry.	Group A—Ovens other than by-product ovens (beehive).	Group B—By-product ovens.	PER CENT OF TOTAL. A	B
Number of establishments	278	222	56	79.8	20.2	Salaries and wages	$49,905,077	$19,010,501	$30,894,576	38.1	61.9
Persons engaged	32,882	15,140	17,742	46.0	54.0	Salaries	7,605,785	2,771,731	4,834,054	36.4	63.6
Proprietors and firm members	41	41	.....	100.0	.....	Wages	42,299,292	16,238,770	26,060,522	38.4	61.6
Salaried employees	3,522	1,333	2,189	37.8	62.2	Paid for contract work	81,127	6,918	74,209	8.5	91.5
Wage earners (av. number)	29,319	13,766	15,553	47.0	53.0	Rent and taxes	9,302,264	2,657,542	61,644,722	28.6	71.4
Primary horsepower	224,879	39,761	185,118	17.7	82.3	Cost of materials	224,266,674	78,155,895	146,110,779	34.8	65.2
Capital	$365,249,622	$137,906,875	$227,342,747	37.8	62.2	Value of products	316,515,838	112,023,466	204,492,372	35.4	66.6
						Value added by manufacture [1]	92,249,164	33,867,571	58,381,593	36.7	63.3

[1] Value of products less cost of materials.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	278	29,319	100.0	....	$316,516	100.0	....	$92,249	100.0	...
Pennsylvania	123	11,536	39.3	1	119,730	37.8	1	39,377	42.7	1
Ohio	13	3,407	11.6	3	46,514	14.7	2	13,342	14.5	2
Alabama	28	3,533	12.1	2	24,669	7.8	4	6,041	6.5	4
Illinois	4	1,396	4.8	5	16,837	5.3	5	4,209	4.6	5
West Virginia	57	1,283	4.4	6	8,369	2.6	8	2,331	2.5	7
New York	3	643	2.2	10	$7,213	2.3	10	$2,097	2.3	9
Minnesota	3	426	1.5	13	6,469	2.1	11	1,497	1.6	13
Virginia	13	849	2.9	7	5,524	1.7	13	1,589	1.7	12
Kentucky	4	568	1.9	12	4,453	1.4	15	974	1.1	14
Tennessee	6	272	0.9	15	2,017	0.6	17	553	0.6	17
All other states [1]	24	5,406	18.4	....	74,721	23.6	....	20,239	21.9	...

[1] Includes Indiana, rank 3, according to value of products; Wisconsin, rank 6; and New Jersey, rank 7.

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	32,882	32,460	422	98.7	1.3
	1914	23,463	23,254	209	99.1	0.9
	1909	31,226	31,112	114	99.6	0.4
roprietors and officials	1919	1,085	1,080	5	99.5	0.5
	1914	610	610	.....	100.0	100.0
	1909	814	807	7	99.1	0.9
Proprietors and firm members	1919	41	40	1	97.6	2.4
	1914	36	36	.....	100.0	.....
	1909	101	96	5	95.0	5.0
Salaried officers of corporations	1919	165	161	4	97.6	2.4
	1914	149	149	.....	100.0	.....
	1909	174	172	2	98.8	1.2
Superintendents and managers	1919	879	879	.....	100.0	.....
	1914	425	425	.....	100.0	.....
	1909	539	539	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	2,478	2,068	410	83.5	16.5
	1914	1,746	1,540	206	88.2	11.8
	1909	1,139	1,037	102	91.0	9.0
Wage earners (average number)	1919	29,319	29,311	8	.....	(1)
	1914	21,107	21,104	3	.....	(1)
	1909	29,273	29,268	5	.....	(1)
16 years of age and over	1919	28,909	28,901	8	.....	(1)
	1914	20,988	20,985	3	.....	(1)
	1909	29,187	29,182	5	.....	(1)
Under 16 years of age	1919	410	410	.....	100.0	.....
	1914	119	119	.....	100.0	.....
	1909	86	86	.....	100.0	.....

[1] Less than one-tenth of 1 per cent.

TABLE 5.—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. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	29,319	**34,557**	32,159	30,479	28,452	26,579	*26,434*	27,917	30,418	30,378	26,817	28,186	29,452	76.5
Other than by-product ovens	13,766	**16,686**	15,579	14,658	13,012	*11,778*	11,810	12,584	13,704	14,057	13,847	13,390	14,087	70.6
By-product ovens	15,553	**17,871**	16,580	15,821	15,440	14,801	14,624	15,333	16,714	16,321	*12,970*	14,796	15,365	72.5
1914	21,107	22,339	22,845	**24,205**	23,257	22,072	21,476	21,386	20,759	20,255	19,077	17,903	*17,710*	73.2
1909	29,273	27,668	27,121	27,003	*26,461*	27,022	28,301	29,106	29,475	30,852	32,390	32,789	**33,094**	80.0
Alabama	3,533	3,773	3,785	3,545	3,511	3,297	*3,000*	3,292	3,545	**3,876**	3,785	3,573	3,424	77.4
Illinois	1,396	**1,625**	1,467	1,345	1,338	1,382	1,480	1,508	1,554	1,388	*710*	1,354	1,601	43.7
Kentucky	568	667	591	552	*487*	547	580	547	537	562	591	591	564	73.0
Minnesota	426	469	429	428	412	416	367	401	*377*	425	450	455	**483**	78.1
New York	643	**898**	731	727	780	606	612	676	665	613	*447*	488	473	52.7
Ohio	3,407	4,257	3,838	3,647	3,575	3,242	3,474	3,533	3,555	3,416	*2,256*	2,961	3,130	53.0
Pennsylvania	11,536	**13,293**	12,367	10,947	10,888	10,120	*9,859*	10,828	12,374	12,077	11,243	11,314	12,122	76.1
Tennessee	272	362	359	338	265	*165*	242	250	275	294	309	170	235	45.6
Virginia	849	929	907	870	797	774	845	794	821	840	826	893	892	83.3
West Virginia	1,283	**2,073**	1,947	1,572	1,219	1,082	1,075	1,022	1,260	1,248	916	*906*	1,076	43.7

TABLE 6.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR STATES: 1919 AND 1914.

STATE.	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..	29,319	342	17	9,250	112	1,854	4,307	2,010	11,427
1914..	21,107	(2)	(2)	1,582	86	6,637	1,809	4,762	6,231
1909..	29,273	(2)	(2)	1,987	359	7,965	149	11,629	7,184
Alabama	3,533	.....	.....	181	.....	.....	277	1,122	1,953
Illinois	1,396	.....	.....	28	.....	.....	1,036	.....	332
Kentucky	568	55	.....	25	.....	94	394	.....	.....
Minnesota	426	.....	.....	.....	.....	.....	.....	.....	426
New York	643	.....	.....	.....	.....	.....	.....	.....	643
Ohio	3,407	.....	.....	.....	.....	.....	1,094	.....	2,313
Pennsylvania	11,536	232	15	5,816	109	1,157	95	370	3,742
Tennessee	272	.....	.....	53	.....	77	.....	35	107
Virginia	849	32	.....	700	.....	.....	46	50	15
West Virginia	1,283	23	2	568	3	211	.....	160	316

[1] Includes 48 and under for 1914 and 1909.

[2] Corresponding figures not available.

TABLE 7.—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.	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	278	29,319	2	48	145	64	818	56	1,906	35	2,574	44	6,965	19	7,076	5	3,017	5	6,818
1914	231	21,107	.....	15	76	52	603	75	2,417	39	2,689	29	4,666	16	5,640	4	2,483	1	2,533
Alabama	28	3,533	.....	3	5	6	94	8	239	5	398	2	368	3	1,352	.....	.....	1	1,077
Illinois	4	1,396	.....	.....	.....	.....	.....	1	28	.....	.....	1	179	1	332	1	857	.....	.....
Kentucky	4	568	.....	.....	.....	.....	.....	1	25	2	149	.....	.....	1	394	.....	.....	.....	.....
Minnesota	3	426	.....	.....	.....	.....	.....	.....	.....	1	91	2	335	.....	.....	.....	.....	.....	.....
New York	3	643	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	119	2	524	.....	.....	.....	.....
Ohio	13	3,407	.....	.....	.....	.....	.....	.....	.....	3	214	4	745	5	1,944	1	504	.....	.....
Pennsylvania	123	11,536	1	24	78	32	426	25	897	17	1,232	16	2,476	5	1,701	.....	.....	3	4,726
Tennessee	6	272	.....	.....	.....	2	17	2	71	1	77	1	107	.....	.....	.....	.....	.....	.....
Virginia	13	849	.....	1	2	1	13	6	210	2	145	3	479	.....	.....	.....	.....	.....	.....
West Virginia	57	1,283	.....	20	60	21	248	11	359	2	136	3	480	.....	.....	.....	.....	.....	.....

TABLE 8.—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	278	231	315	29,319	21,107	29,273	$316,515,838	$99,275,020	$95,696,622	$92,249,164	$30,136,692	$31,672,095
Less than $5,000	6	7	11	5	20	23	19,122	20,037	21,286	5,873	7,235	2,566
$5,000 to $20,000	31	18	40	93	129	530	387,294	238,346	1,262,249	129,838	89,853	393,912
$20,000 to $100,000	58	91	127	663	2,188	3,524	3,180,636	4,578,995	6,780,743	1,014,412	1,652,329	2,143,327
$100,000 to $500,000	80	70	120	2,545	8,045	13,460	19,048,517	16,074,023	36,845,746	5,288,741	9,119,321	10,901,357
$500,000 to $1,000,000	34	22		3,462			25,206,933	14,211,972		7,144,521		
$1,000,000 and over	69	23	17	22,551	10,725	11,736	268,673,336	64,151,647	50,789,598	78,665,779	19,267,954	18,230,932
	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
Less than $5,000	2.2	3.0	3.5	(1)	(1)	0.1	(1)	(1)	(1)	(1)	(1)	(1)
$5,000 to $20,000	11.2	7.8	12.7	0.3	0.6	1.8	0.1	0.2	1.3	0.1	0.3	1.2
$20,000 to $100,000	20.9	39.4	40.3	2.3	9.3	12.0	1.0	4.7	7.1	1.1	5.5	6.8
$100,000 to $500,000	28.8	30.3	38.1	8.7	34.3	46.0	6.0	16.2	38.5	5.7	30.3	34.4
$500,000 to $1,000,000	12.2	9.5		11.8			8.0	14.3		7.7		
$1,000,000 and over	24.8	10.0	5.4	76.9	45.7	40.1	84.9	64.6	53.1	85.3	63.9	57.6

[1] Less than one-tenth of 1 per cent.

TABLE 9.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS, BY INDUSTRY GROUPS: 1919.

INDUSTRY AND VALUE OF PRODUCT.	Number of establishments	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.	
		Average number.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.
The coke industry	278	29,319	100.0	$316,515,838	100.0	$92,249,164	100.0
Less than $5,000	6	5	(1)	19,122	(1)	5,873	(1)
$5,000 to $20,000	31	93	0.3	387,294	0.1	129,838	0.1
$20,000 to $100,000	58	663	2.3	3,180,636	1.0	1,014,412	1.1
$100,000 to $500,000	80	2,545	8.7	19,048,517	6.0	5,288,741	5.7
$500,000 to $1,000,000	34	3,462	11.8	25,206,933	8.0	7,144,521	7.7
$1,000,000 and over	69	22,551	76.9	268,673,336	84.9	78,665,779	85.3
Other than by-product ovens (beehive)	222	13,766	100.0	112,023,466	100.0	33,867,571	100.0
Less than $5,000	6	5	(1)	19,122	(1)	5,873	(1)
$5,000 to $20,000	31	93	0.7	387,294	0.3	129,838	0.4
$20,000 to $100,000	56	607	4.4	3,018,880	2.7	969,777	2.9
Other than by-product ovens (beehive)—Continued.							
$100,000 to $500,000	76	2,435	17.7	$18,081,640	16.1	$5,082,314	15.0
$500,000 to $1,000,000	30	3,087	22.4	22,253,566	19.9	6,321,243	18.7
$1,000,000 and over	23	7,539	54.8	68,262,964	60.9	21,358,526	63.1
By-product ovens	56	15,553	100.0	204,492,372	100.0	58,381,593	100.0
Less than $5,000	.....	.....	.....	.....	.....	.....	.....
$5,000 to $20,000	.....	.....	.....	.....	.....	.....	.....
$20,000 to $100,000	2	56	0.4	161,756	0.1	44,635	0.1
$100,000 to $500,000	4	110	0.7	986,877	0.5	206,427	0.4
$500,000 to $1,000,000	4	375	2.4	2,953,367	1.4	823,278	1.4
$1,000,000 and over	46	15,012	96.5	200,410,372	98.0	57,307,253	98.2

[1] Less than one-tenth of 1 per cent.

TABLE 10.—CHARACTER OF OWNERSHIP: 1919, 1914, AND 1909.

INDUSTRY AND STATE.	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.		
	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States:																	
1919	20	251	7	29,319	507	28,664	148	1.7	97.8	0.5	$316,515,838	$6,037,170	$309,441,015	$1,037,653	1.9	97.8	0.3
Other than by-product ovens (beehive)	20	195	7	13,766	507	13,111	148	3.7	95.2	1.1	112,023,466	6,037,170	104,948,643	1,037,653	5.4	93.7	0.9
By-product ovens	.....	56	.....	15,553	.....	15,553	.....	.....	100.0	.....	204,492,372	.....	204,492,372	.....	.....	100.0	.....
1914	19	205	7	21,107	503	20,433	171	2.4	96.8	0.8	99,275,000	2,998,000	95,659,000	618,000	3.0	96.4	0.6
1909	21	277	7	29,273	1,241	27,470	562	4.2	93.8	2.0	95,696,622	3,158,163	91,280,407	1,258,047	3.3	95.4	1.3
Pennsylvania	17	99	7	11,536	494	10,894	148	4.3	94.4	1.3	119,730,589	5,975,411	112,717,525	1,037,653	4.0	94.2	1.8
Other than by-product ovens (beehive)	17	88	7	7,969	494	7,327	148	6.2	91.9	1.9	70,169,342	5,975,411	63,156,278	1,037,653	8.5	9.0	1.5
By-product ovens	.....	11	.....	3,567	.....	3,567	.....	.....	100.0	.....	49,561,247	.....	49,561,247	.....	.....	10.0	.....
All other states	3	152	.....	17,783	13	17,770	.....	0.1	99.9	.....	196,785,249	61,759	196,723,490	.....	0.3	99.7	.....
Other than by-product ovens (beehive)	3	107	.....	5,797	13	5,784	.....	0.2	99.8	.....	41,854,124	61,759	41,792,365	.....	0.1	0.9	.....
By-product ovens	.....	45	.....	11,986	.....	11,986	.....	.....	100.0	.....	154,931,125	.....	154,931,125	.....	.....	100.0	.....

TABLE 11.—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	2,897	1,766	1,002	224,879	120,327	62,602	100.0	100.0	100.0
Owned	947	755	496	150,328	82,687	47,963	66.8	67.9	76.6
Steam[1]	941	743	486	148,478	80,567	44,591	66.0	66.1	71.2
Engines	786	(2)	(2)	75,256	(2)	(2)	33.5	.....	.....
Turbines	155	(2)	(2)	73,222	(2)	(2)	32.6	.....	.....
Internal-combustion engines	6	12	6	1,850	2,120	1,212	0.8	1.8	1.9
Water wheels, turbines, and motors	.....	.....	4	.....	.....	500	.....	.....	00.8
Rented, electric	1,950	1,011	506	74,551	37,640	[3] 14,639	33.2	32.1	23.4
Electric	5,919	2,735	1,538	209,163	88,409	41,064	100.0	100.0	100.0
Rented	1,950	1,011	506	74,551	37,640	13,754	35.6	42.6	33.5
Generated by establishments reporting	3,969	1,724	1,032	134,612	50,769	27,310	64.4	57.4	66.5

[1] Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.
[2] Not reported separately.
[3] Includes 885 of "Other" rented power.

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

STATE.	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	5,808	64,245,629	560,505	15,211	92,682	658,690
Ovens other than by-product ovens (beehive)	2,231	30,639,938	187,249	.....	89,349	6,175
By-product ovens	3,577	33,605,691	373,256	15,211	3,333	652,515
1914	.....	50,457,454	.....	.....	.....	.....
Alabama	.....	5,281,552	45,041	.....	.....	.....
Illinois	.....	2,457,626	.....	8,086	.....	.....
Kentucky	.....	876,773	.....	.....	.....	.....
Minnesota	.....	849,288	.....	.....	.....	2,288
New York	.....	1,046,991	456	408	.....	2,366
Ohio	.....	7,995,889	53	.....	.....	37,951
Pennsylvania	5,308	30,512,831	500,182	6,717	3,333	606,885
Tennessee	.....	447,003	.....	.....	.....	.....
Virginia	.....	1,482,814	.....	.....	.....	.....
West Virginia	.....	2,242,720	.....	.....	.....	.....
All other states	500	11,052,142	14,773	.....	89,337	9,200

SPECIAL STATISTICS.

Products.—Table 13 presents comparative statistics for products for 1919, 1914, and 1909, including figures for coking coal consumption. The products as compiled and reported by the Geological Survey represent total production inclusive of subsidiary coke and coke-oven by-products produced by establishments not engaged primarily in the manufacture of coke, and exceed in the aggregate the value of the products reported for the establishments constituting the classified industry, to the amount of $5,540,870 in 1919, $6,338,285 in 1914, and $2,381,761 in 1909.

TABLE 13.—PRODUCTS:[1] 1919, 1914, AND 1909.

[Ton, 2,000 pounds.]

	1919	1914	1909
COAL.			
Coal used for coking, all establishments, tons	65,587,918	51,623,750	59,354,937
PRODUCTS.			
The classified industry (establishments engaged primarily in the manufacture of coke), all products, value	$316,515,838	$99,275,020	$95,696,622
Coke and coking by-products, all establishments including subsidiary coke products of establishments in other industries, value [1]	$322,056,708	$105,863,305	$98,078,383
Coke:			
Tons	44,180,557	34,555,914	39,315,065
Value	$258,339,740	$88,334,217	$89,965,483
Made in—			
Beehive ovens—			
Tons	19,042,936	23,335,971	33,060,421
Value	$98,094,972	$50,254,050	$69,530,794
Retort or by-product ovens—			
Tons	25,137,621	11,219,943	6,254,644
Value	$160,244,768	$38,080,167	$20,434,689
PRODUCTS—continued.			
By-products from retort or by-product ovens:			
Gas—			
Production, M cubic feet	415,642,265	.....	.....
Sales—			
M cubic feet	193,073,979	61,364,375	15,791,220
Illuminating and household purposes	5,238,486	.....	.....
Industrial purposes	138,179,761	.....	.....
To public service corporations	49,655,732	.....	.....
Value	$16,685,007	$6,009,583	$2,609,211
Tar—			
Production, gallons	288,898,764	.....	.....
Sales—			
Gallons	217,980,143	109,901,315	60,126,006
Value	$6,919,265	$2,867,274	$1,408,611
Ammonia (sales)—			
Sulphate—			
Pounds	557,619,631	170,763,906	$3,675,771
Value	$21,075,718	$4,696,590	
Anhydrous or free ammonia [2]—			
Pounds	51,046,744	.....	
Value	$5,692,950	$2,958,634	
Benzol products (sales), value	$12,678,886	$997,007	$419,307
Other coking products, value	$665,142		

[1] From report of Geological Survey.

[2] Includes liquor and sulphate sold on pound basis NH_3.

GENERAL TABLES.

Comparative summary, by states.—Table 14 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.

Detailed statement, by states.—Table 15 is a detailed statement, by states, for the census of 1919.

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

STATE.	Census year.	Number of establishments	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
All industries	1919	278	29,319	224,879	$42,299	$224,267	$316,516
	1914	231	21,107	120,327	14,289	69,138	99,275
	1909	315	29,273	62,602	15,454	64,025	95,697
Alabama	1919	28	3,533	13,147	3,484	18,628	24,669
	1914	18	2,209	11,728	1,261	7,363	10,353
	1909	35	2,580	5,766	1,283	6,371	8,843
Illinois	1919	4	1,396	9,915	2,400	12,628	16,837
	1914	3	1,178	13,054	942	5,828	7,840
Kentucky	1919	4	568	3,308	760	3,479	4,453
	1914	5	472	3,366	269	820	1,255
Ohio	1919	13	3,407	43,119	6,559	33,172	46,514
	1914	5	489	2,325	352	1,607	2,157
	1909	4	246	1,250	120	640	851
Pennsylvania	1919	123	11,536	72,752	$15,554	$80,354	$119,730
	1914	108	9,871	36,213	6,635	29,820	42,996
	1909	146	15,331	26,091	8,436	33,762	51,816
Tennessee	1919	6	272	2,345	260	1,464	2,017
	1914	5	170	493	74	513	605
	1909	8	250	370	87	478	586
Virginia	1919	13	849	1,243	1,084	3,935	5,524
	1914	11	852	2,057	384	1,070	1,607
	1909	16	1,425	1,760	543	1,818	2,416
West Virginia	1919	57	1,283	9,493	1,420	6,037	8,369
	1914	54	1,392	2,920	692	1,893	2,978
	1909	71	4,426	5,307	1,664	5,012	7,563
All other states	1919	30	6,475	69,557	10,778	64,570	88,403
	1914	22	4,474	48,171	3,680	20,224	29,484
	1909	35	5,015	22,058	3,321	15,944	23,622

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.	EXPENSES.
	Total.	A	B	Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc.		Wage earners.			Total.	16 and over.		Under 16.		Salaries and wages.
							Male.	Female.	Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.		Male.	Female	Male.		Officials.
United States	278	222	56	32,882	41	1,044	2,068	410	29,319	Ja 34,557	Je 26,434	30,857	30,404	8	445	$365,249,622	$3,669,708
A—Other than by-product ovens (beehive)	222	222	.....	15,140	41	400	777	156	13,766	Ja 16,778	My 11,778	15,039	15,032	1	6	137,906,875	1,298,081
B—By-product ovens	56	.....	56	17,742	.....	644	1,291	254	15,553	Ja 17,871	Oc 12,970	15,818	15,372	7	439	227,342,747	2,371,627
Alabama	28	23	5	3,830	2	103	179	13	3,533	Se 3,876	Je 3,000	3,632	3,632	.....	.....	28,927,905	377,236
Illinois	4	.....	4	1,640	.....	89	119	36	1,396	Ja 1,625	Oc 710	1,558	1,558	.....	.....	25,931,172	237,125
Kentucky	4	3	1	627	.....	22	31	6	568	Ja 667	Ap 487	564	564	.....	.....	4,765,766	40,317
Minnesota	3	.....	3	510	.....	13	67	4	426	De 483	Je 367	483	481	2	.....	9,508,441	46,406
New York	3	.....	3	683	.....	21	17	2	643	Ja 898	Oc 447	473	473	.....	.....	11,573,436	59,534
Ohio	13	1	12	3,847	.....	109	268	63	3,407	Ja 4,257	Oc 2,256	3,154	2,713	2	439	48,242,369	425,411
Pennsylvania	123	112	11	13,050	38	366	935	175	11,536	Ja 13,293	Je 9,859	12,472	12,463	3	6	125,341,038	1,432,758
Tennessee	6	5	1	290	1	10	6	1	272	Ja 362	My 165	346	346	.....	.....	2,035,359	34,009
Virginia	13	13	.....	922	.....	31	38	4	849	Ja 929	My 774	902	902	.....	.....	5,152,665	76,892
West Virginia	57	53	4	1,437	.....	86	60	8	1,283	Ja 2,073	No 906	1,530	1,530	.....	.....	12,635,737	158,083
All other states[1]	24	12	12	6,046	.....	194	348	98	5,406	.....	.....	5,743	5,742	1	.....	91,135,734	774,937

STATE.	EXPENSES—continued.							Value of products.	Value added by manufacture.	POWER.					Electric horsepower generated in establishments reporting.
	Salaries and wages—Continued.		For contract work.	Rent and taxes.		For materials.				Primary horsepower.					
										Total.	Owned.			Rented electric.	
	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.				Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.		
United States	$3,936,077	$42,299,292	$81,127	$467,217	$8,835,047	$23,497,210	$200,769,464	$316,515,838	$92,249,164	224,879	75,256	73,222	1,850	74,551	134,612
A—Other than by-product ovens (beehive)	1,473,650	16,238,770	6,918	318,706	2,338,836	7,405,378	70,750,517	112,023,466	33,867,571	39,761	22,436	4,133	.....	13,192	19,254
B—By-product ovens	2,462,427	26,060,522	74,209	148,511	6,496,211	16,091,832	130,018,947	204,492,372	58,381,593	185,118	52,820	69,089	1,850	61,359	115,358
Alabama	264,031	3,483,825	.....	38,293	417,164	1,698,866	16,929,550	24,669,105	6,040,689	13,147	5,525	5,250	.....	2,372	3,951
Illinois	257,477	2,399,848	.....	3,567	1,195,591	854,561	11,773,154	16,837,024	4,209,309	9,915	4,815	5,100	.....	.....	13,901
Kentucky	74,116	759,681	.....	.....	24,175	441,909	3,037,337	4,453,285	974,039	3,308	2,650	458	.....	200	1,240
Minnesota	86,495	694,714	.....	.....	118,349	457,473	4,513,873	6,468,654	1,497,308	7,774	2,618	112	.....	5,044	420
New York	27,882	1,167,323	70,621	.....	258,840	529,455	4,586,226	7,212,747	2,097,066	8,475	2,341	2,379	980	2,775	1,533
Ohio	498,458	6,559,347	1,450	72	940,762	2,783,735	30,388,211	46,514,213	13,342,267	43,119	16,067	12,600	870	13,582	24,039
Pennsylvania	1,808,628	15,553,532	6,918	127,519	1,195,330	10,560,096	69,793,625	119,730,589	39,376,868	72,752	17,435	40,608	.....	14,709	53,942
Tennessee	8,639	259,529	.....	4,719	22,166	646,027	817,612	2,016,868	553,219	2,345	2,220	125	.....	.....	1,242
Virginia	66,302	1,084,572	.....	61,754	67,265	190,992	3,744,428	5,524,215	1,588,795	1,243	233	.....	.....	1,010	201
West Virginia	67,604	1,419,567	.....	6,969	152,776	547,551	5,489,687	8,368,698	2,331,460	9,493	3,829	.....	.....	5,664	620
All other states[1]	776,445	8,917,454	2,133	224,324	4,442,629	4,788,545	49,695,761	74,720,450	20,238,144	53,308	17,523	6,590	.....	29,195	33,433

[1] All other states embrace: Colorado, 3 (A, 2; B, 1) establishments; Georgia, 1 (A); Indiana, 5 (B); Maryland, 1(B); Massachusetts, 1 (A); Michigan, 2 (B); New Jersey, 2 (A, 1; B, 1); New Mexico, 2 (A); Oklahoma, 1 (B); Utah, 1 (A); Washington, 3 (A); and Wisconsin, 2 (A, 1; B, 1).

SALT.

GENERAL STATISTICS.

General character of the industry.—This industry embraces the establishments engaged primarily in the production of salt.

The major part of the salt industry pertains to manufacturing, although it is closely related to mining or the extraction of materials from the earth, which statistics of materials and products are collected annually by the Geological Survey. The production figures are as compiled by the Geological Survey and have been coordinated with the general statistics for the industry.

Comparative summary.—Table 1 presents the 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 the industry, number of establishments, average number of wage earners, value of products, and value added by manufacture, by 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 13.

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 6.5 per cent of the average number of wage earners employed in 1919.

Prevailing hours of labor.—The figures in Table 5 show a movement toward shortening of the hours of employment. In 1919, 20.1 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were 48 or less, whereas in 1914 but 6.7 per cent were in establishments of this character, and in 1909, 4.4 per cent. On the other hand, in 1909, 83.6 per cent of all wage earners were in establishments where the hours of labor were 60 or more per week, this percentage decreasing to 62.6 per cent in 1914, and to 33.1 per cent in 1919.

Size of establishments, by average number of wage earners.—In 1919 the average number of wage earners for all plants was 76 as compared with 52 in 1914. In 1919, as shown in Table 6, 22 establishments each employed over 100 wage earners, in the aggregate, 68.4 per cent of all wage earners, as compared with 15 establishments of the same class in 1914 with 56.9 per cent of all wage earners.

Size of establishments, by value of products.—The average value of products per establishment increased from $144,000 in 1914 to $436,000 in 1919, though this increase is largely due to enhanced values, and this condition accounts in the main for the changes from lower to higher groups shown in Table 7.

Character of ownership.—Table 8 presents statistics showing the character of ownership. Although a considerable number of establishments are owned by individuals or firms, yet the "Corporation" group controls the bulk of the industry. These establishments reported 97.6 per cent of the value of all products in 1919, 97 per cent in 1914, and 91.3 per cent in 1909.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power.

Fuel consumed.—Table 10 presents statistics for fuel, by kinds and by states. The figures for gas include both natural and manufactured gas, 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	86	98	124	146	159	200	268	.....	.....	.....	.....	.....	.....
Persons engaged	7,682	5,736	5,580	5,171	5,261	(2)	(2)	43.2	−3.8	7.9	−1.7	.....	.....
Proprietors and firm members	40	60	74	87	81	(2)	(2)	.....	.....	−14.9	7.4	.....	.....
Salaried employees	1,147	587	570	418	406	(2)	(2)	429.0	−61.9	36.4	3.0	.....	.....
Wage earners (average number)	6,495	5,089	4,936	4,666	4,774	4,255	4,289	27.6	3.1	5.8	−2.3	(2)	(2)
Primary horsepower	43,187	29,007	27,263	19,434	23,865	11,552	8,476	48.9	6.4	40.3	−18.6	106.6	36.3
Capital	$47,725,231	$33,151,134	$29,011,793	$25,586,282	$27,123,364	$13,437,749	$8,225,740	44.0	14.3	13.4	−5.7	101.8	63.4
Salaries and wages	9,909,506	4,009,703	3,250,176	2,553,824	2,410,888	11782,491	1,260,023	147.0	23.4	27.3	5.9	35.3	41.5
Salaries	2,556,086	968,409	718,730	487,425	499,748	(2)	(2)	167.0	34.7	47.5	−2.5	.....	.....
Wages	7,353,420	3,041,294	2,531,446	2,066,399	1,911,140	(2)	(2)	142.0	20.1	22.5	8.1	.....	.....
Paid for contract work	31,496	59,563	122,407	26,313	25,277	(2)	(2)	−47.1	−51.3	.....	.....	.....	.....
Rent and taxes	1,981,807	179,341	149,725	[3] 115,412	[3] 113,407	(2)	(2)	1,005.0	19.8	.....	.....	.....	.....
Cost of materials	16,027,791	6,273,030	5,203,354	4,166,137	3,335,922	1,826,770	2,074,049	155.6	20.6	24.9	24.9	82.6	−11.9
Value of products	37,513,821	14,070,333	11,327,834	9,437,662	7,966,897	5,484,618	4,829,566	167.0	24.2	20.0	18.5	45.3	13.6
Value added by manufacture [4]	21,486,030	7,797,303	6,124,480	5,271,525	4,630,975	3,657,848	2,755,517	176.0	27.3	16.2	13.8	26.6	32.7

[1] A minus sign (−) denotes decrease. [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	86	6,495	100.0	....	$37,514	100.0	....	$21,486	100.0	...
Michigan	12	2,063	31.8	1	14,054	37.5	1	7,715	35.9	1
New York	16	1,728	26.8	2	9,099	24.3	2	5,188	24.1	2
Kansas	12	1,072	16.5	3	6,193	16.5	3	3,986	18.6	3
Ohio	5	535	8.2	4	$2,668	7.1	4	$1,287	6.0	4
California	24	446	6.9	5	2,286	6.1	5	1,201	5.6	5
Texas	3	277	4.3	6	1,016	2.7	7	536	2.5	7
West Virginia	4	71	1.1	9	213	0.6	9	92	0.4	9
All other states	10	303	4.6	....	1,985	5.3	....	1,481	6.9	...

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.	
					Male.	Female.
All classes	1919	7,682	7,012	670	91.3	8.7
	1914	5,736	5,256	480	91.6	8.4
	1909	5,580	5,132	448	92.0	8.0
Proprietors and officials	1919	357	341	16	95.5	4.5
	1914	277	257	20	92.8	7.2
	1909	291	276	15	94.8	5.2
Proprietors and firm members	1919	40	30	10	75.0	25.0
	1914	60	42	18	70.0	30.0
	1909	74	59	15	79.7	20.3
Salaried officers of corporations	1919	109	104	5	95.4	4.6
	1914	88	86	2	97.7	2.3
	1909	94	94	.....	100.0	.....
Superintendents and managers	1919	208	207	1	99.5	0.5
	1914	129	129	.....	100.0	.....
	1909	123	123	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	830	595	235	71.7	28.3
	1914	370	266	104	71.9	28.1
	1909	353	276	77	78.2	21.8
Wage earners (average number)	1919	6,495	6,076	419	93.5	6.5
	1914	5,089	4,733	356	93.0	7.0
	1909	4,936	4,580	356	92.8	7.2
16 years of age and over	1919	6,470	6,060	410	93.7	6.3
	1914	5,076	4,720	356	93.0	7.0
	1909	4,929	4,575	354	92.8	7.2
Under 16 years of age	1919	25	16	9	64.0	36.0
	1914	13	13	.....	100.0	.....
	1909	7	5	2	71.4	2.6

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	6,495	6,433	6,220	6,179	6,161	*5,994*	6,114	6,443	6,900	6,771	**7,110**	6,826	6,789	84.3
Males	6,076	6,051	5,848	5,829	5,773	*5,628*	5,725	6,006	6,446	6,326	6,626	6,339	6,315	84.9
Females	419	382	372	*350*	388	366	389	437	454	445	484	487	474	71.9
1914	5,089	4,731	*4,654*	4,875	5,096	5,126	5,128	5,167	5,221	5,448	**5,492**	5,159	4,971	84.7
1909	4,936	*4,340*	4,462	4,846	4,977	4,984	5,132	5,229	5,198	5,192	5,158	5,070	4,636	83.0
California	446	*407*	412	424	423	436	418	464	507	519	522	515	473	78.0
Kansas	1,072	1,051	1,081	1,079	1,068	1,044	1,048	1,021	1,127	1,123	**1,154**	1,082	*986*	85.4
Michigan	2,063	2,017	1,964	*1,928*	1,981	1,925	2,016	2,060	2,178	2,125	2,143	2,169	**2,755**	69.8
New York	1,728	1,630	*1,598*	1,668	1,608	1,615	1,617	1,811	1,917	1,866	1,793	1,799	1,814	83.4
Ohio	535	575	521	484	*450*	459	508	530	564	551	604	**604**	570	74.5
Texas	277	289	260	253	252	268	265	294	330	336	331	*222*	224	66.1
West Virginia	71	84	*39*	43	64	71	75	88	96	94	90	50	58	40.6

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

STATE.	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	6,495	2	12	1,291	547	1,021	1,470	1,416	736
1914	5,089	(2)	(2)	340	.....	772	792	2,538	647
1909	4,936	(2)	(2)	214	.....	459	135	2,991	1,137
California	446	2	10	157	.....	185	.....	92	.....
Kansas	1,072	.....	.....	.....	.....	.....	284	503	285
Michigan	2,063	.....	2	541	.....	411	587	428	94
New York	1,728	.....	.....	276	169	395	446	206	236
Ohio	535	.....	.....	.....	378	.....	66	.....	91
Texas	277	.....	.....	227	.....	.....	50	.....	.....
West Virginia	71	.....	.....	4	.....	30	37	.....	.....

[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 SELECTED 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.		Over 250 wage earners.	
			Establishments.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States 1919	86	6,495	6	15	35	10	103	13	438	20	1,479	16	2,423	6	2,017
1914	98	5,089	7	22	60	15	192	24	853	15	1,090	13	2,247	2	647
California	24	446	3	7	15	7	73	4	130	3	228	.....	.....	.....	.....
Kansas	12	1,072	.....	.....	.....	1	11	2	68	5	314	3	405	1	274
Michigan	12	2,063	.....	1	3	.....	.....	.....	.....	4	326	4	662	3	1,072
New York	16	1,728	.....	3	10	1	8	2	55	4	292	4	692	2	671
Ohio	5	535	.....	.....	.....	.....	.....	1	49	2	157	2	329	.....	.....
Texas	3	277	.....	.....	.....	.....	.....	1	50	.....	.....	2	227	.....	.....
West Virginia	4	71	.....	1	4	1	11	2	56	.....	.....	.....	.....	.....	.....

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

VALUE OF PRODUCT.	NUMBER OF ESTABLISHMENTS		AVERAGE NUMBER OF WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.	
	1919	1914	1919	1914	1919	1914	1919	1914
All classes	86	98	6,495	5,089	$37,513,821	$14,070,333	$21,486,030	$7,797,303
Less than $5,000	12	22	8	44	26,520	55,168	22,721	46,497
$5,000 to $20,000	9	18	34	166	105,077	220,818	53,510	140,634
$20,000 to $100,000	15	20	249	553	819,554	1,167,780	493,831	673,957
$100,000 to $500,000	29	35	2,016	4,326	8,363,886	12,626,567	4,442,790	6,936,215
$500,000 to $1,000,000	10	2	1,139		6,822,518		4,226,187	
$1,000,000 and over	11	1	3,049		21,376,266		12,246,991	
	PER CENT DISTRIBUTION.							
All classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $5,000	14.0	22.4	0.1	0.9	0.1	0.4	0.1	0.6
$5,000 to $20,000	10.5	18.4	0.5	3.3	0.3	1.6	0.2	1.8
$20,000 to $100,000	17.4	20.4	3.8	10.9	2.2	8.3	2.3	8.6
$100,000 to $500,000	33.7	34.8	31.0	85.0	22.3	89.7	20.7	89.0
$500,000 to $1,000,000	11.6	2.6	17.5		18.2		19.7	
$1,000,000 and over	12.8	1.0	47.0		57.0		57.0	

TABLE 8.—CHARACTER OF OWNERSHIP: 1919, 1914, AND 1909.

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
All classes	1919	86	6,495	$37,513,821
	1914	98	5,089	14,070,333
	1909	124	4,936	11,327,834
Individual	1919	9	50	109,171
	1914	13	98	160,000
	1909	25	(1)	637,438
Corporation	1919	67	6,180	36,604,513
	1914	70	4,860	13,655,000
	1909	84	(1)	10,345,414
All other	1919	10	265	800,137
	1914	15	131	255,000
	1909	15	(1)	344,982

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
Per cent distribution:				
Individual	1919	10.5	0.8	0.3
	1914	13.3	1.9	1.1
	1909	20.1	.....	5.6
Corporation	1919	77.9	95.2	97.6
	1914	71.4	95.5	97.0
	1909	67.8	.....	91.3
All other	1919	11.6	4.1	2.1
	1914	15.3	2.6	1.8
	1909	12.1	.....	3.0

[1] Figures not available.

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	807	549	478	43,187	29,007	27,263	100.0	100.0	100.0
Owned	426	354	397	35,345	25,757	26,008	81.8	88.8	95.4
Steam [1]	370	309	345	34,309	24,900	25,118	79.4	85.8	92.1
Engines	320	309	345	29,399	24,900	25,118	68.1	85.8	92.1
Turbines	50	.....	.....	4,910	.....	(2)	11.4	.....	.....
Internal-combustion engines	49	42	51	981	779	782	2.3	2.7	2.9
Water wheels, turbines, and motors	7	3	1	55	78	108	0.1	0.3	0.4
Rented	381	195	81	7,842	3,250	1,255	18.2	11.2	4.6
Electric	381	195	81	6,706	3,250	1,241	15.5	11.2	4.5
Other	.....	.....	.....	1,136	.....	14	2.6	.....	0.1
Electric	1,126	553	239	2,842	7,742	3,425	100.0	100.0	100.0
Rented	381	195	81	6,706	3,250	1,241	85.5	42.0	36.2
Generated by establishments reporting	745	358	158	1,136	4,492	2,184	14.5	58.0	63.8

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

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

	COAL.		Coke (tons, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).		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).						Anthracite (tons, 2,240 pounds).	Bituminous (tons, 2,000 pounds).				
United States 1919	81,251	957,447	6,920	126,581	17,046	45,085	New York	81,251	153,640	16	3	44	.....
1914	85,894	714,402	535	55,443	(1)	869,339	Ohio	.....	119,210	1,800	2	2	900
California	.....	162	.....	35,038	947	100	Texas	.....	63,436	4,571	60,000	5	.....
Kansas	.....	128,035	533	31,538	.....	35,927	West Virginia	.....	15,970	.....	.....	.....	8,158
Michigan	.....	471,462	.....	.....	.....	.....	All other states	.....	5,532	.....	.....	16,048	.....

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 11 presents comparative statistics of products for 1919, 1914, and 1909.

TABLE 11.—PRODUCTS: 1919, 1914, AND 1909.

	1919	1914	1909		1919	1914	1909
Number of establishments	86	98	124	Bromine:			
				Pounds	1,854,971	576,991	569,725
Products, total value	$37,513,821	$14,070,333	$11,327,834	Value	$1,234,969	$203,094	$57,600
				Average value, pound	$0.67	$0.35	$0.10
Salt:				Calcium chloride: [2]			
Tons (2,000 pounds)	6,882,902	[1] 4,872,656	4,195,628	Tons (2,000 pounds)	26,123	19,403	12,853
Value	$27,074,694	$10,271,358	$8,311,729	Value	$321,596	$121,766	$63,198
Average value, ton	$3.93	$2.11	$1.89	Average value, ton	$12.31	$6.28	$4.92
				All other products, value	$8,882,562	$3,474,115	$2,895,307

[1] Includes solar salt, Porto Rico.
[2] Calcium-magnesium chloride marketed in the United States, production from natural brine; not including that obtained in the manufacture of soda.

GENERAL TABLES.

Comparative summary, by states.—Table 12 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.

Detailed statement, by states.—Table 13 is a detailed statement, by states, for the year 1919.

TABLE 12.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	86	6,495	43,187	$7,353	$16,028	$37,514
	1914	98	5,089	29,007	3,041	6,273	14,070
	1909	124	4,936	27,263	2,531	5,203	11,328
California	1919	24	446	2,976	537	1,084	2,286
	1914	22	347	2,079	262	397	1,215
	1909	19	402	1,228	212	242	746
Kansas	1919	12	1,072	8,719	1,145	2,207	6,193
	1914	9	467	4,791	274	661	1,334
	1909	10	451	3,387	188	519	1,106
Michigan	1919	12	2,063	10,321	2,530	6,339	14,054
	1914	15	1,434	8,316	991	2,067	4,421
	1909	27	1,363	6,628	745	1,643	3,653
New York	1919	16	1,728	7,219	1,784	3,911	9,099
	1914	26	1,510	6,540	816	1,365	3,554
	1909	33	1,525	9,923	765	1,195	2,897
Ohio	1919	5	535	8,259	$675	$1,380	$2,668
	1914	8	813	4,037	441	1,204	2,197
	1909	8	648	4,034	361	1,090	1,807
Texas	1919	3	277	1,656	307	480	1,016
	1914	3	140	809	75	227	425
	1909	6	162	447	82	216	407
West Virginia	1919	4	71	1,092	66	121	213
	1914	3	117	515	51	94	169
	1909	3	110	335	46	69	131
All other states	1919	10	303	2,945	300	506	1,085
	1914	12	261	1,020	131	258	755
	1909	18	275	1,281	132	229	581

TABLE 13.—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.	16 and over.		Under 16.			Salaries and wages.	
					Male.	Female.	Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.		Male.	Female.	Male.	Female.		Officials.	Clerks, etc.
United States	86	7,682	40	317	595	235	6,495	Oc 7,110	My 5,994	7,023	6,514	481	17	11	$47,725,231	$1,344,648	$1,211,438
California	24	540	20	37	25	12	446	No 509	Je 393	482	434	43	2	3	4,068,367	94,605	38,395
Kansas	12	1,331	1	60	142	56	1,072	Oc 1,154	De 986	994	939	55	.....	.....	5,807,406	238,071	255,114
Michigan	12	2,513	.....	95	257	98	2,063	De 2,255	Mh 1,923	2,274	2,110	154	10	.....	12,804,398	413,813	490,017
New York	16	1,851	5	56	118	44	1,728	Au 1,917	Fe 1,598	1,851	1,739	109	.....	3	15,367,068	338,291	320,623
Ohio	5	591	.....	26	16	14	535	Oc[1] 604	Ap 450	570	505	65	.....	.....	4,525,920	139,147	46,275
Texas	3	308	5	13	12	1	277	Se 336	No 222	333	298	35	.....	.....	1,046,991	32,590	17,742
West Virginia	4	92	.....	12	4	5	71	Au 96	Fe 39	98	98	.....	.....	.....	847,944	28,770	8,196
All other states[2]	10	356	9	18	21	5	303	.....	.....	421	391	20	5	5	3,257,137	59,361	35,076

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 horsepower generated in establishments reporting.
										Owned.				Rented.[4]	
	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.[3]		
United States	$7,353,420	$31,496	$171,416	$1,810,391	$11,339,924	$4,687,867	$37,513,821	$21,486,030	43,187	29,399	4,910	981	55	7,842	8,065
California	537,358	4,771	38,995	53,715	959,415	125,045	2,285,927	1,201,467	2,976	755	240	783	5	1,193	410
Kansas	1,144,736	24,000	610	506,067	1,540,197	666,322	6,192,693	3,986,174	8,719	6,533	744	.....	.....	1,442	845
Michigan	2,539,083	.....	1,350	511,348	4,207,499	2,131,420	14,053,799	7,714,880	10,321	5,538	1,743	2	.....	3,038	1,582
New York	1,784,269	.....	5,690	466,575	2,877,244	1,033,258	9,098,775	5,188,273	7,219	6,298	650	66	50	155	2,551
Ohio	675,207	.....	.....	109,421	932,947	447,442	2,667,780	1,287,391	8,259	6,930	950	5	.....	374	2,039
Texas	307,094	500	4,019	28,732	310,544	169,915	1,016,031	535,572	1,656	990	433	33	.....	200	308
West Virginia	65,802	.....	.....	3,364	68,538	52,583	212,832	91,711	1,092	875	150	67	.....	.....	35
All other states[2]	299,871	2,225	120,752	131,169	443,540	61,882	1,985,984	1,480,562	2,945	1,480	.....	25	.....	1,440	295

[1] Same number reported for one or more other months.
[2] All other states embrace: Louisiana, 2 establishments; Nevada, 1; New Mexico, 1; and Utah, 6.
[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).

DRUGGISTS' PREPARATIONS, PATENT MEDICINES AND COMPOUNDS, AND PERFUMERY AND COSMETICS.

GENERAL STATISTICS.

General character of the industries.—Separate statistics have been compiled for these three allied industries. Druggists' preparations include, in the main, articles of manufacture for use by druggists in compounding medicines to be dispensed upon physicians' prescriptions. Patent medicines and compounds are those sold under the protection of a patent, copyright or trade-mark, or prepared according to secret formula, including those of a proprietary character though not necessarily patented. Perfumery and cosmetics embrace toilet preparations, toilet waters, cold cream, etc., and perfumes. Each establishment is classed according to its principal products in one of these industries, but in many cases an establishment manufactures products pertaining to more than one branch, and there is also a large production of these commodities by establishments that fall under other classified industries. With respect to a specific product, the report aims to give the total production irrespective of the classification of the establishment.

Drug grinding is a closely allied industry and the statistics pertaining to establishments engaged primarily in the grinding of drugs are given at the end of the report.

Comparison with earlier censuses.—Table 1 presents the comparative statistics for the industrial group, and for the three industries constituting the industrial group, for the census years 1899 to 1919, inclusive, with percentages of increase for the census periods.

Principal states, ranked by value of products.—Table 2 presents the statistics relating to number of establishments, wage earners, value of products, and value added by manufacture for the industrial group, by states, ranked according to value of products. The only change in rank among the leading 10 states since 1914 is with respect to Illinois, now second, which ranked third in 1914, Michigan then being second.

Persons engaged in the industry.—The age classification of the average number of wage earners, as given in Table 3, is an estimate obtained by the method described in the "Explanation of terms." The table presents the statistics for the industrial group and for the component industries. Statistics for states will be found in Table 16.

Wage earners, by months.—Table 4 gives the total number of wage earners, by months, for the industrial group for 1919, 1914, and 1909, and for the component industries for 1919 and 1914. These industries give employment to a large number of females and the statistics are given, by states, for the combined industries for all wage earners and for females. The figures reflect the steadiness of employment, or the reverse, during the census year. The fluctuation in employment during 1919 did not differ materially from 1914 and 1909. The proportion of females employed in 1919 ranged from 44.2 per cent of the total state number in Iowa to a maximum of 64.3 per cent in Maryland.

Prevailing hours of labor.—Table 5 shows that in 1909 only 20.8 per cent of the wage earners were employed in establishments where the prevailing hours of labor were 48 per week or fewer. In 1914 the proportion was 25 per cent, and in 1919 it increased to 60.1 per cent, with 16 per cent in the "44 and under" group. On the other hand, 7.6 per cent of all wage earners in 1909 were in establishments where the prevailing hours of labor per week were 60 or more. This dropped to 5.4 per cent in 1914, with a still further reduction to 1.4 per cent in 1919.

Size of establishments, by average number of wage earners.—Table 6 shows that in 1919, 75.7 per cent of the establishments employed not exceeding 5 wage earners, inclusive of those where the work is done by the proprietor or proprietors. In 1914 the corresponding proportion was 82.6 per cent, and in 1909, 83.6 per cent. The preponderance of small establishments is most pronounced in the "Perfumery and cosmetics" industry, where the groups of "No wage earners," and "1 to 5 wage earners" comprised 80.1 per cent of the establishments in 1919. In the "Patent medicines and compounds" industry, 72.2 per cent were of this character; and in "Druggists' preparations," 58.8 per cent. In 1919 there were 21 establishments which employed over 250 wage earners, these establishments reporting 33.4 per cent of all wage earners. In 1914 there were 12 establishments of like character with 24.5 per cent of the wage earners; and in 1909, 9 establishments with 22.7 per cent. Considering the group

as a unit, the establishments averaged 11 wage earners per establishment in 1919, 7 in 1914, and 6 in 1909. The reports from this industry include a large number of establishments owned by individuals or by firms, and this condition is reflected in the relatively large number of establishments that employ few or no wage earners.

Size of establishments, by value of products.—The grouping by value of products in Table 7 reflects the general increase in values. The average value of products per establishment for the industrial group increased from $38,970 in 1909 to $43,872 in 1914, and to $108,531 in 1919, the 1919 increase being essentially due to the advance in prices, which accounts for the changes from lower to higher groups. The establishments engaged primarily in the manufacture of druggists' preparations show the highest average values per establishment, namely, $218,690 in 1919, $115,408 in 1914, and $117,223 in 1909. Next comes the perfumery and cosmetics industry with an average value of $104,769 in 1919, $34,071 in 1914, and $33,128 in 1909; and then patent medicines and compounds with $86,000 in 1919, $35,296 in 1914, and $29,518 in 1909.

Character of ownership.—Table 8 shows the classification of the establishments according to ownership. The industry includes a large number of individual establishments, and likewise those classed as "All other," chiefly firms. The decrease in the total number of establishments in 1919 as compared with 1914 is mainly in these two groups, the decrease of 255 establishments consisting of 140 owned by individuals, 109 of the "All other" class, and 6 by corporations. The "Corporation" group, however, employed 86.5 per cent of the wage earners in 1919 as compared with 82.3 per cent in 1914 and 79.4 per cent in 1909; and reported 87.4 per cent of the products in 1919, 83.2 per cent in 1914, and 78.5 per cent in 1909.

Number and horsepower of types of prime movers.—Table 9 presents the power statistics for the industrial group for 1919, 1914, and 1909, and for the three component industries for 1919 and 1914. Electric power is a growing factor, and of the total primary power, 72.4 per cent was utilized in the form of electric power in 1919, this including electric motor equipment operated with purchased current, specified as rented, and secondary electric or that generated by the establishment, as compared with 62.1 per cent in 1914 and 43.6 per cent in 1909.

Fuel consumed.—Table 10 shows the consumption of fuel, by kinds, for the industrial group and for the component industries in 1919 and 1914, and by states for the group for 1919. Figures for gas include both natural and manufactured.

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

	1919	1914	1909	1904	1899	1889	PER CENT OF INCREASE.[1] 1914–1919	1909–1914	1904–1909	1899–1904	1889–1899
THE INDUSTRIAL GROUP.											
Number of establishments	3,560	3,815	3,642	2,777	2,154	3,089	−6.7	4.8	31.1	28.9	−30.3
Persons engaged	63,985	45,856	41,101	32,248	(2)	(2)	39.5	11.6	27.5	.....	.....
Proprietors and firm members	2,304	2,725	2,802	2,293	(2)	(2)	−15.4	−2.7	22.2	.....	.....
Salaried employees	23,264	17,629	15,404	9,483	8,094	4,600	32.0	14.4	62.4	17.2	76.0
Wage earners (average number)	38,417	25,502	22,895	20,472	19,028	10,485	50.6	11.4	11.8	7.6	(3)
Primary horsepower	40,571	28,872	25,659	17,008	12,707	3,439	40.5	12.5	50.9	33.8	269.5
Capital	$278,294,501	$127,721,551	$99,942,150	$75,607,029	$56,172,646	$25,460,538	117.9	27.8	32.2	34.6	120.6
Salaries and wages	74,378,463	35,587,443	26,904,013	17,888,264	15,175,024	7,910,581	109.0	32.3	50.4	17.9	91.8
Salaries	44,484,709	22,877,868	17,007,339	9,974,946	8,265,413	3,613,092	94.4	34.5	70.5	20.7	128.7
Wages	29,893,754	12,709,575	9,896,674	7,913,318	6,909,611	4,296,589	135.0	28.4	25.1	14.5	60.8
Paid for contract work	1,107,217	222,925	364,723	254,171	(2)	(2)	396.7	−38.9	43.5	.....	.....
Rent and taxes	23,976,047	3,109,070	2,050,454	[4] 1,442,351	(2)	(2)	671.2	51.6	42.2	.....	.....
Cost of materials	170,104,918	66,339,943	50,375,665	39,494,289	31,949,890	15,571,187	156.4	31.7	27.6	23.6	105.1
Value of products	380,369,132	167,372,129	141,941,602	117,435,874	88,790,774	43,910,120	130.8	17.9	20.9	32.3	102.0
Value added by manufacture [5]	216,264,214	101,032,186	91,565,937	77,941,585	56,840,884	28,338,933	114.1	10.3	17.5	37.1	100.6
DRUGGISTS' PREPARATIONS.											
Number of establishments	524	416	375	240	173	[6] 1,805	26.0	10.9	56.2	38.7	−90.4
Persons engaged	22,569	14,508	14,408	10,304	(2)	(2)	55.6	0.7	39.8	.....	.....
Proprietors and firm members	283	229	225	155	(2)	(2)	23.6	1.8	45.2	.....	.....
Salaried employees	6,718	5,002	4,693	2,739	1,982	1,909	34.3	6.6	71.3	38.2	3.8
Wage earners (average number)	15,568	9,277	9,490	7,410	5,658	2,031	67.8	−2.2	28.1	31.0	178.6
Primary horsepower	12,698	8,417	9,580	6,102	3,813	51	50.9	−12.1	57.0	60.0	7,376.5
Capital	$102,129,257	$46,638,098	$37,767,112	$25,152,363	$16,004,640	$4,624,814	119.0	23.5	50.2	57.2	246.1
Salaries and wages	25,480,411	11,799,490	10,028,713	5,967,095	4,229,124	1,938,700	115.9	17.7	68.1	41.1	118.1
Salaries	13,318,486	7,044,982	5,870,281	3,174,181	2,222,584	1,099,014	89.0	20.0	84.9	42.8	102.2
Wages	12,161,925	4,754,508	4,158,432	2,792,914	2,006,540	839,686	155.8	14.3	48.9	39.2	139.0
Paid for contract work	78,918	27,901	66,575	5,321	(2)	(2)	182.9	−58.1	1,151.2	.....	.....
Rent and taxes	5,796,899	739,139	487,876	[4] 352,065	(2)	(2)	684.3	51.5	38.6	.....	.....
Cost of materials	55,138,475	22,934,723	17,847,006	13,419,635	10,814,432	2,411,851	140.4	28.5	33.0	24.1	348.4
Value of products	114,593,486	48,009,654	43,958,479	31,782,250	22,714,889	6,659,797	138.7	9.2	38.3	39.9	241.1
Value added by manufacture [5]	59,455,011	25,074,931	26,111,473	18,362,615	11,900,457	4,247,946	137.1	−4.0	42.2	54.3	180.1
PATENT MEDICINES AND COMPOUNDS.											
Number of establishments	2,467	2,903	2,838	2,245	1,719	1,127	−15.0	2.3	26.4	30.6	52.5
Persons engaged	31,970	25,927	22,476	18,770	(2)	(2)	23.3	15.4	19.7	.....	.....
Proprietors and firm members	1,648	2,112	2,219	1,862	(2)	(2)	−22.0	−4.8	19.2	.....	.....
Salaried employees	12,878	10,487	9,227	5,928	5,304	2,332	22.8	13.7	55.7	11.8	127.4
Wage earners (average number)	17,444	13,328	11,030	10,980	11,606	7,058	30.9	20.8	0.5	−5.4	(3)
Primary horsepower	25,677	18,542	14,704	10,092	8,223	2,928	38.5	26.1	45.7	22.7	180.8
Capital	$143,498,611	$71,436,840	$55,386,674	$45,611,640	$36,677,833	$18,596,823	100.9	29.0	21.4	24.4	97.2
Salaries and wages	38,485,025	20,039,539	14,233,422	10,275,541	9,619,559	5,094,202	92.0	40.8	38.5	6.8	88.8
Salaries	24,736,212	13,364,371	9,489,401	5,923,674	5,285,134	2,138,819	85.1	40.8	60.2	12.1	147.1
Wages	13,748,813	6,675,168	4,744,021	4,351,867	4,334,425	2,955,383	106.0	40.7	9.0	0.4	46.7
Paid for contract work	803,210	175,617	274,978	244,820	(2)	(2)	357.4	−36.1	12.3	.....	.....
Rent and taxes	15,574,708	1,867,077	1,245,011	[4] 905,908	(2)	(2)	734.2	50.0	37.4	.....	.....
Cost of materials	88,819,417	35,940,434	26,894,628	21,293,051	18,000,441	11,030,916	147.1	33.6	26.3	18.3	63.2
Value of products	212,162,255	102,463,374	83,771,154	74,520,765	58,988,181	32,620,182	107.1	22.3	12.4	26.3	80.8
Value added by manufacture [5]	123,342,838	66,522,940	56,876,526	53,227,714	40,987,740	21,589,266	85.4	17.0	6.9	29.9	89.9
PERFUMERY AND COSMETICS.											
Number of establishments	569	496	429	292	262	157	14.7	15.6	46.9	11.5	66.9
Persons engaged	9,446	5,421	4,217	3,174	(2)	(2)	74.2	28.6	32.9	.....	.....
Proprietors and firm members	373	384	358	276	(2)	(2)	−2.9	7.3	29.7	.....	.....
Salaried employees	3,668	2,140	1,484	816	808	359	71.4	44.2	81.9	1.0	125.0
Wage earners (average number)	5,405	2,897	2,375	2,082	1,764	1,396	86.6	22.0	14.1	18.0	(3)
Primary horsepower	2,196	1,913	1,375	814	671	460	14.8	39.1	68.9	21.3	45.9
Capital	$32,666,633	$9,646,613	$6,788,364	$4,843,026	$3,490,173	$2,238,901	238.6	42.1	40.2	38.8	55.9
Salaries and wages	10,413,027	3,748,414	2,641,878	1,645,628	1,326,341	877,679	177.8	41.9	60.5	24.1	51.1
Salaries	6,430,011	2,468,515	1,647,657	877,091	757,695	376,159	160.5	49.8	87.9	15.8	101.4
Wages	3,983,016	1,279,899	994,221	768,537	568,646	501,520	211.2	28.7	29.4	35.2	13.4
Paid for contract work	225,089	19,407	23,170	4,030	(2)	(2)	1,059.8	−16.2	474.9	.....	.....
Rent and taxes	2,604,440	502,854	317,567	[4] 184,378	(2)	(2)	417.9	58.3	72.2	.....	.....
Cost of materials	26,147,026	7,464,786	5,634,031	4,781,603	3,135,017	2,128,420	250.3	32.5	17.8	52.5	47.3
Value of products	59,613,391	16,899,101	14,211,969	11,132,859	7,087,704	4,630,141	252.8	18.9	27.7	57.1	53.1
Value added by manufacture [5]	33,466,365	9,434,315	8,577,938	6,351,256	3,952,687	2,501,721	254.7	10.0	35.1	60.7	58.0

[1] A minus sign (−) denotes decrease.
[2] Figures not available.
[3] Figures not strictly comparable.
[4] Exclusive of internal revenue.
[5] Value of products less cost of materials.
[6] Includes custom and neighborhood shops.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	3,560	38,417	100.0	...	$386,369	100.0	...	$216,264	100.0	...
New York	680	9,218	24.0	1	101,457	26.3	1	56,021	25.9	1
Illinois	314	2,812	7.3	4	39,030	10.1	2	22,270	10.3	2
Michigan	107	4,751	12.4	2	34,945	9.0	3	20,255	9.4	3
Pennsylvania	332	3,399	8.9	3	26,374	6.8	4	15,123	7.0	4
Missouri	201	1,786	4.6	8	21,325	5.5	5	12,948	6.0	5
Massachusetts	139	2,390	6.2	6	20,327	5.3	6	11,716	5.4	6
Ohio	237	1,695	4.4	9	18,922	4.9	7	11,507	5.3	7
New Jersey	112	2,420	6.3	5	18,715	4.8	8	8,274	3.8	8
Maryland	76	1,461	3.8	10	15,806	4.1	9	7,377	3.4	10
Indiana	118	1,877	4.9	7	14,035	3.6	10	7,841	3.6	9
Tennessee	93	1,004	2.6	11	11,092	2.9	11	6,199	2.9	11
Iowa	114	746	1.9	12	$10,659	2.8	12	$6,003	2.8	12
Minnesota	75	646	1.7	13	7,270	1.9	13	4,112	1.9	13
North Carolina	31	213	0.6	23	4,892	1.3	14	3,294	1.5	14
Connecticut	38	431	1.1	15	4,775	1.2	15	3,210	1.5	15
California	137	577	1.5	14	4,152	1.1	17	2,205	1.0	17
Georgia	54	244	0.6	19	3,681	1.0	18	2,613	1.2	16
Wisconsin	61	232	0.6	22	2,643	0.7	19	1,538	0.7	20
Texas	68	301	0.8	17	2,505	0.6	20	1,509	0.7	21
Kentucky	38	256	0.7	18	2,327	0.6	22	1,578	0.7	18
Louisiana	25	171	0.4	24	1,006	0.3	29	584	0.3	27
Washington	30	47	0.1	33	510	0.1	32	289	0.1	32
Rhode Island	27	40	0.1	36	351	0.1	35	204	0.1	35
All other states	423	1,700	4.4	...	19,540	5.1	...	9,594	4.4	...

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
THE INDUSTRIAL GROUP	1919	63,985	34,546	29,439	54.0	46.0
	1914	45,856	27,561	18,295	60.1	39.9
	1909	41,101	23,676	17,425	57.6	42.4
Proprietors and officials	1919	7,460	6,684	776	89.6	10.4
	1914	5,969	5,470	499	91.6	8.4
	1909	5,647	5,187	460	91.9	8.1
Proprietors and firm members	1919	2,304	2,041	263	88.6	11.4
	1914	2,725	2,428	297	89.1	10.9
	1909	2,802	2,489	313	88.8	11.2
Salaried officers of corporations	1919	2,298	2,072	226	90.2	9.8
	1914	1,679	1,563	116	93.1	6.9
	1909	1,427	1,362	65	95.4	4.6
Superintendents and managers	1919	2,858	2,571	287	90.0	10.0
	1914	1,565	1,479	86	94.5	5.5
	1909	1,418	1,336	82	94.2	5.8
Clerks and other subordinate salaried employees.	1919	18,108	10,141	7,967	56.0	44.0
	1914	14,385	9,093	5,292	63.2	36.8
	1909	12,559	7,631	4,928	60.8	39.2
Wage earners (average number)	1919	38,417	17,721	20,696	46.1	53.9
	1914	25,502	12,998	12,504	51.0	49.0
	1909	22,895	10,858	12,037	47.4	52.6
16 years of age and over	1919	37,724	17,455	20,269	46.3	53.7
	1914	25,096	12,825	12,271	51.1	48.9
	1909	22,425	10,681	11,744	47.6	52.4
Under 16 years of age	1919	693	266	427	38.4	61.6
	1914	406	173	233	42.6	57.4
	1909	470	177	293	37.7	62.3
DRUGGISTS' PREPARATIONS	1919	22,569	12,108	10,461	53.6	46.4
	1914	14,508	8,636	5,872	59.5	40.5
	1909	14,408	8,044	6,364	55.8	44.2
Proprietors and officials	1919	1,654	1,538	116	93.0	7.0
	1914	864	834	30	96.5	3.5
	1909	903	877	26	97.1	2.9
Proprietors and firm members	1919	283	261	22	92.2	7.8
	1914	229	225	4	98.3	1.7
	1909	225	214	11	95.1	4.9
Salaried officers of corporations	1919	439	406	33	92.5	7.5
	1914	268	258	10	96.3	3.7
	1909	290	282	8	97.2	2.8
Superintendents and managers	1919	932	871	61	93.5	6.5
	1914	367	351	16	95.6	4.4
	1909	388	381	7	98.2	1.8
Clerks and other subordinate salaried employees.	1919	5,347	3,032	2,315	56.7	43.3
	1914	4,367	3,067	1,300	70.2	29.8
	1909	4,015	2,640	1,375	65.8	34.2
Wage earners (average number)	1919	15,568	7,538	8,030	48.4	51.6
	1914	9,277	4,735	4,542	51.0	49.0
	1909	9,490	4,527	4,963	47.7	52.3
16 years of age and over	1919	15,342	7,440	7,902	48.5	51.5
	1914	9,164	4,688	4,476	51.2	48.8
	1909	9,320	4,455	4,865	47.8	52.2
Under 16 years of age	1919	226	98	128	43.4	56.6
	1914	113	47	66	41.6	58.4
	1909	170	72	98	42.4	57.6
PATENT MEDICINES AND COMPOUNDS.	1919	31,970	18,641	13,329	58.3	41.7
	1914	25,927	16,376	9,551	63.2	36.8
	1909	22,476	13,624	8,852	60.6	39.4
Proprietors and officials	1919	4,673	4,197	476	89.8	10.2
	1914	4,333	3,979	354	91.8	8.2
	1909	4,077	3,738	339	91.7	8.2
Proprietors and firm members	1919	1,648	1,473	175	89.4	10.3
	1914	2,112	1,897	215	89.8	10.6
	1909	2,219	1,976	243	89.0	11.2
Salaried officers of corporations	1919	1,465	1,321	144	90.2	9..
	1914	1,201	1,121	80	93.3	6.8
	1909	972	935	37	96.2	3.7
Superintendents and managers	1919	1,560	1,403	157	89.9	10.8
	1914	1,020	961	59	94.2	5.1
	1909	886	827	59	93.3	6.8
Clerks and other subordinate salaried employees.	1919	9,853	5,915	3,938	60.0	40.0
	1914	8,266	5,151	3,115	62.3	37.7
	1909	7,369	4,400	2,969	59.7	40.3
Wage earners (average number)	1919	17,444	8,529	8,915	48.9	51.1
	1914	13,328	7,246	6,082	54.4	45.6
	1909	11,030	5,486	5,544	49.7	50.3
16 years of age and over	1919	17,096	8,401	8,695	49.1	50.9
	1914	13,089	7,137	5,952	54.5	45.5
	1909	10,776	5,405	5,371	50.2	49.8
Under 16 years of age	1919	348	128	220	36.8	63.2
	1914	239	109	130	45.6	54.4
	1909	254	81	173	31.9	68.1
PERFUMERY AND COSMETICS	1919	9,446	3,797	5,649	40.2	59.8
	1914	5,421	2,549	2,872	47.0	53.0
	1909	4,217	2,008	2,209	47.6	52.4
Proprietors and officials	1919	1,133	949	184	83.8	16.2
	1914	772	657	115	85.1	14.9
	1909	667	572	95	85.8	14.2
Proprietors and firm members	1919	373	307	66	82.3	17.7
	1914	384	306	78	79.7	20.3
	1909	358	299	59	83.5	16.5
Salaried officers of corporations	1919	394	345	49	87.6	12.4
	1914	210	184	26	87.6	12.4
	1909	165	145	20	87.9	12.1
Superintendents and managers	1919	366	297	69	81.1	18.9
	1914	178	167	11	93.8	6.2
	1909	144	128	16	88.9	11.1
Clerks and other subordinate salaried employees.	1919	2,908	1,194	1,714	41.1	58.9
	1914	1,752	875	877	49.9	50.1
	1909	1,175	591	584	50.3	49.7
Wage earners (average number)	1919	5,405	1,654	3,751	30.6	69.4
	1914	2,897	1,017	1,880	35.1	64.9
	1909	2,375	845	1,530	35.6	64.4
16 years of age and over	1919	5,286	1,614	3,672	30.5	69.5
	1914	2,843	1,000	1,843	35.2	64.8
	1909	2,329	821	1,508	35.3	64.7
Under 16 years of age	1919	119	40	79	33.6	66.4
	1914	54	17	37	31.5	68.5
	1909	46	24	22	52.2	47.8

TABLE 4.—WAGE EARNERS, BY MONTHS, FOR SELECTED 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:														
The industrial group—														
1919	38,417	38,913	39,347	39,102	37,995	37,457	*36,784*	37,059	37,311	38,027	39,095	40,036	39,878	91.9
Males	17,721	17,516	17,680	17,724	17,507	17,435	*17,237*	17,549	17,571	17,768	17,964	18,334	18,367	93.8
Females	20,696	21,397	21,667	21,378	20,488	20,022	19,547	*19,510*	19,740	20,259	21,131	21,702	21,511	89.9
1914	25,502	26,073	26,453	26,674	26,363	25,808	24,804	24,626	*24,184*	25,111	25,446	25,329	25,153	90.7
1909	22,895	22,526	22,898	23,337	23,138	22,672	21,942	*21,406*	21,540	22,829	23,865	24,363	24,202	89.9
Druggists' preparations:														
1919	15,568	16,275	16,359	16,159	15,484	15,219	*14,941*	15,138	14,961	15,221	15,547	15,709	15,803	91.3
Males	7,538	7,534	7,448	7,487	7,344	7,358	*7,339*	7,584	7,595	7,719	7,682	7,676	7,690	95.1
Females	8,030	8,741	8,911	8,672	8,140	7,861	7,602	7,554	7,366	*7,502*	7,865	8,033	8,113	84.2
1914	9,277	9,549	9,558	9,540	9,423	9,311	9,146	8,976	*8,855*	9,301	9,351	9,247	9,067	92.6
Patent medicines and compounds:														
1919	17,444	17,917	18,112	17,938	17,415	17,002	16,629	*16,607*	16,756	17,086	17,600	18,165	18,101	91.4
Males	8,529	8,507	8,710	8,701	8,607	8,467	8,289	8,316	*8,228*	8,305	8,490	8,846	8,822	93.7
Females	8,915	9,410	9,402	9,237	8,808	8,535	8,340	*8,291*	8,468	8,781	9,110	9,319	9,279	88.1
1914	13,328	13,878	14,143	14,235	14,000	13,569	12,753	12,804	*12,543*	12,862	12,945	13,082	13,122	88.1
Perfumery and cosmetics:														
1919	5,405	*4,721*	4,876	5,005	5,096	5,236	5,214	5,314	5,594	5,720	5,948	6,162	5,974	76.6
Males	1,654	*1,475*	1,522	1,536	1,556	1,610	1,609	1,649	1,688	1,744	1,792	1,812	1,855	79.5
Females	3,751	*3,246*	3,354	3,469	3,540	3,626	3,605	3,665	3,906	3,976	4,156	4,350	4,119	74.6
1914	2,897	*2,646*	2,752	2,899	2,940	2,928	2,905	2,846	2,786	2,948	3,150	3,000	2,964	84.0
California	577	615	615	582	589	574	563	548	*543*	548	553	581	613	88.3
Illinois	2,812	2,795	2,831	2,838	2,739	2,757	*2,690*	2,717	2,781	2,821	2,885	2,906	2,984	90.1
Indiana	1,877	2,048	2,031	1,953	1,811	1,799	*1,772*	1,805	1,772	1,880	1,901	1,874	1,878	86.5
Iowa	746	*695*	677	713	729	743	759	772	780	781	786	746	751	88.4
Maryland	1,461	1,418	1,430	1,464	1,472	1,440	*1,393*	1,422	1,394	1,428	1,559	1,561	1,551	89.2
Massachusetts	2,390	2,722	2,790	2,547	2,289	2,191	*2,071*	2,158	2,084	2,240	2,418	2,577	2,593	74.2
Michigan	4,751	4,732	4,781	4,788	4,661	4,608	*4,554*	4,646	4,725	4,800	4,803	4,984	4,930	91.4
Minnesota	646	*556*	585	599	613	642	702	738	714	666	674	642	621	75.3
Missouri	1,786	1,755	1,787	1,800	1,766	1,753	1,713	*1,677*	1,730	1,810	1,884	1,885	1,872	89.0
New Jersey	2,420	2,616	2,549	2,561	2,414	2,258	*2,225*	2,259	2,315	2,351	2,465	2,533	2,494	85.1
New York	9,218	9,466	9,604	9,404	9,270	9,063	8,824	*8,687*	8,867	8,969	9,313	9,669	9,480	89.8
Ohio	1,695	1,610	1,657	1,750	1,669	1,605	*1,586*	1,601	1,680	1,691	1,778	1,840	1,873	84.7
Pennsylvania	3,399	3,440	3,482	3,412	3,277	3,240	*3,169*	3,332	3,336	3,464	3,567	3,532	3,537	88.8
Tennessee	1,004	*919*	924	984	981	1,031	1,060	990	991	993	1,036	1,056	1,083	84.9
States showing large proportion of females.														Per ct. av. is of state.
California	328	370	352	327	340	330	323	309	*303*	307	313	328	334	56.8
Illinois	1,526	1,557	1,585	1,591	1,499	1,496	1,456	*1,453*	1,507	1,498	1,530	1,548	1,592	54.3
Indiana	1,085	1,304	1,246	1,171	1,052	1,030	980	1,005	*995*	1,028	1,077	1,073	1,089	57.8
Iowa	330	338	320	323	313	303	318	327	320	339	353	347	353	44.2
Maryland	940	925	932	959	956	924	900	913	*881*	902	1,010	991	987	64.3
Massachusetts	1,142	1,207	1,451	1,301	1,055	1,015	980	1,020	*944*	1,038	1,140	1,272	1,281	47.8
Michigan	2,653	2,721	2,684	2,676	2,598	2,579	*2,559*	2,600	2,593	2,676	2,647	2,746	2,757	55.8
Minnesota	367	*301*	323	337	341	360	401	434	415	374	393	368	357	56.8
Missouri	984	990	1,013	1,009	975	962	922	*890*	932	989	1,046	1,039	1,041	55.1
New Jersey	1,129	1,285	1,264	1,263	1,170	1,042	*986*	999	1,044	1,037	1,118	1,186	1,154	46.7
New York	5,312	5,547	5,609	5,443	5,394	5,189	5,014	*4,889*	5,084	5,144	5,400	5,638	5,393	57.6
Ohio	948	901	914	982	926	888	*874*	889	936	950	1,006	1,052	1,058	55.9
Pennsylvania	1,690	1,791	1,814	1,769	1,670	1,651	1,588	*1,580*	1,584	1,662	1,731	1,723	1,717	49.7
Tennessee	581	551	*534*	589	580	612	618	569	566	565	580	601	619	58.0

TABLE 5.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED 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:										
The industrial group	1919	38,417	6,123	6,742	10,242	10,898	2,868	1,018	503	23
	1914	25,502	(2)	(2)	6,373	9,894	5,172	2,690	1,307	60
	1909	22,895	(2)	(2)	4,763	6,517	6,574	3,308	1,665	68
Druggists' preparations	1919	15,568	1,421	4,207	2,920	5,173	1,343	208	296	.....
	1914	9,277	(2)	(2)	1,264	4,394	2,460	869	264	26
Patent medicines and compounds	1919	17,444	3,075	1,664	5,860	4,581	1,262	779	200	23
	1914	13,328	(2)	(2)	4,223	4,251	2,241	1,565	1,008	40
Perfumery and cosmetics	1919	5,405	1,627	871	1,462	1,144	263	31	7	.....
	1914	2,897	(2)	(2)	886	1,249	471	256	35	.....
California [3]	1919	577	179	101	283	.....	2	.....	12	.....
Illinois	1919	2,812	648	425	795	636	240	5	63	.....
	1914	1,844	(2)	(2)	472	518	562	227	65	.....
Indiana	1919	1,877	217	6	115	1,230	169	66	74	.....
	1914	804	(2)	(2)	86	506	173	57	27	15
Iowa [3]	1919	746	99	134	269	98	40	18	88	.....
Maryland	1919	1,461	46	27	78	1,290	15	1	4	.....
	1914	1,053	(2)	(2)	376	608	40	18	11	.....
Massachusetts	1919	2,390	133	106	1,969	173	7	.....	2	.....
	1914	1,381	(2)	(2)	477	693	85	105	21	.....
Michigan	1919	4,751	76	2,928	912	618	112	60	45	.....
	1914	3,369	(2)	(2)	77	2,761	380	132	19	.....
Minnesota	1919	646	31	102	237	81	175	15	5	.....
	1914	613	(2)	(2)	98	98	181	215	21	.....
Missouri	1919	1,786	313	180	451	334	455	35	15	3
	1914	1,090	(2)	(2)	224	584	204	16	45	17
New Jersey	1919	2,420	526	498	119	1,237	26	9	1	4
	1914	1,271	(2)	(2)	105	160	508	463	35	.....
New York	1919	9,218	2,361	1,065	3,229	1,809	631	109	12	2
	1914	5,699	(2)	(2)	1,979	2,268	708	696	39	9
Ohio	1919	1,695	334	271	276	706	41	43	17	7
	1914	1,032	(2)	(2)	205	234	157	354	82	.....
Pennsylvania	1919	3,399	639	313	340	1,677	375	40	13	2
	1914	2,833	(2)	(2)	576	693	1,501	14	49	.....
Tennessee	1919	1,004	46	119	179	412	176	58	12	2
	1914	648	(2)	(2)	65	227	171	71	106	8

[1] Includes 48 and under for 1914 and 1909. [2] Corresponding figures not available. [3] Included in "All other states" in 1914.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED 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.	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:																				
The industrial group—1919	3,560	38,417	951	1,744	3,516	565	6,067	179	5,801	66	4,584	34	5,623	14	4,736	4	2,975	3	5,115	
Druggists' preparations	524	15,568	96	212	494	127	1,353	46	1,509	22	1,569	8	1,308	8	2,951	2	1,269	3	5,115	
Patent medicines and compounds	2,467	17,444	721	1,255	2,401	327	3,439	109	3,501	29	2,020	21	3,387	3	990	2	1,706	.....	.....	
Perfumery and cosmetics	569	5,405	134	277	621	111	1,275	24	791	15	995	5	928	3	795	.....	.....	.....	.....	
1914	3,815	25,502	1,179	1,973	3,936	456	4,956	131	4,190	46	3,341	18	2,841	9	3,209	2	1,335	1	1,694	
1909	3,642	22,895	1,051	1,993	3,942	403	4,251	125	3,868	40	2,889	21	2,743	6	2,228	2	1,185	1	1,789	
California	137	577	50	64	112	16	150	4	99	3	216	.....	.....	.....	.....	.....	.....	.....	.....	
Illinois	314	2,812	77	155	379	54	566	16	481	7	404	4	724	1	258	.....	.....	.....	.....	
Indiana	118	1,877	29	61	115	17	159	7	233	3	240	.....	.....	.....	.....	.....	.....	1	1,130	
Iowa	114	746	24	67	144	13	142	6	160	3	198	1	102	.....	.....	.....	.....	.....	.....	
Maryland	76	1,461	19	36	64	12	129	4	140	2	124	1	143	1	281	1	580	.....	.....	
Massachusetts	139	2,390	39	60	120	29	337	6	206	3	193	1	180	.....	.....	.....	.....	1	1,354	
Michigan	107	4,751	30	43	92	21	237	3	71	5	310	2	341	1	286	1	783	1	2,631	
Minnesota	75	646	13	38	65	17	164	5	169	1	75	1	173	.....	.....	.....	.....	.....	.....	
Missouri	201	1,786	50	94	202	39	374	11	378	5	390	1	127	1	315	.....	.....	.....	.....	
New Jersey	112	2,420	24	51	98	20	218	10	345	2	174	2	386	3	1,199	.....	.....	.....	.....	
New York	680	9,218	160	304	638	136	1,569	46	1,593	20	1,411	8	1,389	5	1,695	1	923	.....	.....	
Ohio	267	1,695	92	127	247	33	362	10	347	1	80	4	659	.....	.....	.....	.....	.....	.....	
Pennsylvania	332	3,399	99	165	328	40	394	18	544	4	310	3	432	2	702	1	689	.....	.....	
Tennessee	93	1,004	11	52	90	17	187	8	244	3	173	2	310	.....	.....	.....	.....	.....	.....	

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
THE INDUSTRIAL GROUP.												
All classes	3,560	3,815	3,642	38,417	25,502	22,895	$386,369,132	$167,372,129	$141,941,602	$216,264,214	$101,032,186	$91,565,937
Less than $5,000	1,225	1,851	1,741	430	919	997	2,595,863	3,622,268	3,438,580	1,551,108	2,338,869	2,375,162
$5,000 to $20,000	901	1,004	1,016	1,547	2,361	2,232	9,437,917	10,475,453	10,163,891	5,425,869	6,448,308	6,636,614
$20,000 to $100,000	853	641	619	4,836	4,741	4,711	39,793,188	29,150,874	28,184,453	22,620,857	17,293,181	17,634,400
$100,000 to $500,000	428	260	247	8,414	9,787	9,026	95,754,065	55,235,230	66,522,117	52,163,733	49,098,132	44,105,836
$500,000 to $1,000,000	79	34		4,549			54,727,620	22,668,135		31,229,129		
$1,000,000 and over	74	25	19	18,641	7,694	5,929	184,060,479	46,220,169	33,632,561	103,273,518	25,853,696	20,813,925
DRUGGISTS' PREPARATIONS.												
All classes	524	416	375	15,568	9,277	9,490	114,593,486	48,009,654	43,958,479	59,455,011	25,074,931	26,111,473
Less than $5,000	124	112	(1)	38	99	(1)	235,042	261,826	(1)	142,531	165,394	(1)
$5,000 to $20,000	117	103	.....	257	292	.....	1,307,771	1,122,106	.....	720,752	596,423	.....
$20,000 to $100,000	144	125	.....	1,051	1,241	.....	7,175,183	5,825,328	.....	3,745,196	2,981,821	.....
$100,000 to $500,000	97	59	.....	2,342	2,837	.....	22,693,187	11,647,596	.....	11,186,444	8,744,058	.....
$500,000 to $1,000,000	23	7	.....	1,850			15,351,495	4,594,273	.....	6,847,628		
$1,000,000 and over	19	10	.....	10,030	4,808	.....	67,830,808	24,558,525	.....	36,812,460	12,587,235	.....
PATENT MEDICINES AND COMPOUNDS.												
All classes	2,467	2,903	2,838	17,444	13,328	11,030	212,162,255	102,463,374	83,771,154	123,342,838	66,522,940	56,876,526
Less than $5,000	942	1,519	(1)	330	704	(1)	1,978,248	2,911,607	(1)	1,196,606	1,904,501	(1)
$5,000 to $20,000	630	749	.....	1,047	1,594	.....	6,493,742	7,707,045	.....	3,839,459	4,913,784	.....
$20,000 to $100,000	551	436	.....	2,854	2,749	.....	25,474,880	19,745,307	.....	15,191,432	12,445,537	.....
$100,000 to $500,000	258	160	.....	4,503	5,521	.....	57,084,474	34,697,995	.....	32,321,835	34,611,806	.....
$500,000 to $1,000,000	44	25	.....	2,067			30,735,031	16,775,394	.....	18,690,974		
$1,000,000 and over	42	14	.....	6,643	2,760	.....	90,390,880	20,626,026	.....	52,102,632	12,647,312	.....
PERFUMERY AND COSMETICS.												
All classes	569	496	429	5,405	2,897	2,375	59,613,391	16,899,101	14,211,969	33,466,365	9,434,315	8,577,938
Less than $5,000	159	220	(1)	62	116	(1)	382,573	448,835	(1)	211,971	268,974	(1)
$5,000 to $20,000	154	152	.....	243	475	.....	1,631,404	1,646,302	.....	865,658	938,101	.....
$20,000 to $100,000	158	80	.....	931	751	.....	7,143,125	3,580,239	.....	3,684,229	1,865,823	.....
$100,000 to $500,000	73	41	.....	1,569	1,555	.....	15,976,404	11,223,725	.....	8,655,454	6,361,417	.....
$500,000 to $1,000,000	12	2	.....	632			8,641,094			5,690,527		
$1,000,000 and over	13	1	.....	1,968			25,838,791			14,358,526		
	PER CENT DISTRIBUTION.											
THE INDUSTRIAL GROUP.												
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	34.4	48.5	47.8	1.1	3.6	4.4	0.7	2.2	2.4	0.7	2.3	2.6
$5,000 to $20,000	25.3	26.3	27.9	4.0	9.3	9.7	2.4	6.3	7.2	2.5	6.4	7.2
$20,000 to $100,000	24.0	16.8	17.0	12.6	18.6	20.6	10.3	17.4	19.9	10.5	17.1	19.3
$100,000 to $500,000	12.0	6.8	6.8	21.9	38.4	39.4	24.8	33.0	46.9	24.1	48.6	48.2
$500,000 to $1,000,000	2.2	0.9		11.8			14.2	13.5		14.4		
$1,000,000 and over	2.1	0.7	0.5	48.5	36.2	25.9	47.6	27.6	23.7	47.8	25.6	22.7
DRUGGISTS' PREPARATIONS.												
All classes	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)
Less than $5,000	23.7	26.9	.....	0.2	1.1	.....	0.2	0.5	.....	0.2	0.7	.....
$5,000 to $20,000	22.3	24.8	.....	1.7	3.1	.....	1.1	2.3	.....	1.2	2.4	.....
$20,000 to $100,000	27.5	30.0	.....	6.8	13.4	.....	6.3	12.1	.....	6.3	11.9	.....
$100,000 to $500,000	18.5	14.2	.....	15.0	30.6	.....	19.8	24.3	.....	18.8	34.9	.....
$500,000 to $1,000,000	4.4	1.7	.....	11.9			13.4	9.6	.....	11.5		
$1,000,000 and over	3.6	2.4	.....	64.4	51.8	.....	59.2	51.2	.....	61.9	50.2	.....
PATENT MEDICINES AND COMPOUNDS.												
All classes	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)
Less than $5,000	38.2	52.3	.....	1.9	5.3	.....	0.9	2.8	.....	1.0	2.9	.....
$5,000 to $20,000	25.5	25.8	.....	6.0	12.0	.....	3.1	7.5	.....	3.1	7.4	.....
$20,000 to $100,000	22.3	15.0	.....	16.4	20.6	.....	12.0	19.3	.....	12.3	18.7	.....
$100,000 to $500,000	10.5	5.5	.....	25.8	41.4	.....	26.9	33.9	.....	26.2	52.0	.....
$500,000 to $1,000,000	1.8	0.9	.....	11.8			14.5	16.4	.....	15.2		
$1,000,000 and over	1.7	0.5	.....	38.1	20.7	.....	42.6	20.1	.....	42.2	19.0	.....
PERFUMERY AND COSMETICS.												
All classes	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)	100.0	100.0	(1)
Less than $5,000	27.9	44.4	.....	1.1	4.0	.....	0.6	2.7	.....	0.6	2.9	.....
$5,000 to $20,000	27.1	30.6	.....	4.5	16.4	.....	2.7	9.7	.....	2.6	9.9	.....
$20,000 to $100,000	27.8	16.1	.....	17.2	25.9	.....	12.0	21.2	.....	11.0	19.8	.....
$100,000 to $500,000	12.8	8.3	.....	29.0	53.7	.....	26.8	66.4	.....	25.9	67.4	.....
$500,000 to $1,000,000	2.1	0.4	.....	11.7			14.5			17.0		
$1,000,000 and over	2.3	0.2	.....	36.4	.....	.....	43.3	.....	.....	42.9	.....	.....

[1] Figures not available.

TABLE 8.—CHARACTER OF OWNERSHIP: 1919, 1914, AND 1909.

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
All classes	1919	3,560	38,417	$386,369,132	$216,264,214
	1914	3,815	25,502	167,372,129	101,032,186
	1909	3,642	22,895	141,941,602	91,565,937
Individual	1919	1,358	3,417	30,749,346	17,642,335
	1914	1,498	2,735	15,272,953	9,688,004
	1909	1,520	2,624	16,571,003	10,868,714
Corporation	1919	1,818	33,226	337,017,858	188,356,445
	1914	1,824	20,988	139,303,775	83,300,188
	1909	1,610	18,176	111,493,887	72,081,395
All other	1919	384	1,774	18,001,028	10,265,434
	1914	493	1,779	12,795,401	8,043,994
	1909	512	2,095	13,876,712	8,615,828
Per cent distribution:					
Individual	1919	38.1	8.9	7.9	8.1
	1914	39.3	10.7	9.1	9.6
	1909	41.7	11.5	11.7	11.9
Corporation	1919	51.1	86.5	87.4	87.1
	1914	47.8	82.3	83.2	82.4
	1909	44.2	79.4	78.5	78.7
All other	1919	10.8	4.6	4.7	4.8
	1914	12.9	7.0	7.6	8.0
	1909	14.1	9.2	9.8	9.4

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
THE INDUSTRIAL GROUP.									
Primary power, total	5,128	3,069	2,020	40,571	28,872	25,659	100.0	100.0	100.0
Owned	339	461	507	19,719	18,087	18,035	48.6	62.6	70.3
Steam[1]	232	280	333	18,713	15,908	16,059	46.1	55.1	62.6
Engines	229	(2)	(2)	18,182	(2)	(2)	44.8	(2)	(2)
Turbines	3			531			1.3		
Internal-combustion engines	96	170	161	951	2,000	1,712	2.3	6.9	6.7
Water wheels, turbines, and motors	11	11	13	55	179	264	0.1	0.6	1.0
Rented	4,789	2,608	1,513	20,852	10,785	7,624	51.4	37.4	29.7
Electric	4,789	2,608	1,513	20,556	10,422	6,882	50.7	36.1	26.8
Other	.....	.....	.....	296	363	742	0.7	1.3	2.9
Electric	7,142	4,253	2,354	29,364	17,924	11,175	100.0	100.0	100.0
Rented	4,789	2,608	1,513	20,556	10,422	6,882	70.0	58.1	61.6
Generated by establishments reporting	2,353	1,645	841	8,808	7,502	4,293	30.0	41.9	38.4
DRUGGISTS' PREPARATIONS.									
Primary power, total	1,344	634	(3)	12,698	8,417	(3)	100.0	100.0	(3)
Owned	115	89	.....	8,406	6,285	.....	66.2	74.7	.....
Rented	1,229	545	.....	4,292	2,132	.....	33.8	25.3	.....
Electric	2,724	1,574	.....	8,432	6,130	.....	100.0	100.0	.....
Rented	1,229	545	.....	4,264	2,083	.....	50.7	34.0	.....
Generated by establishment reporting	1,495	1,029	.....	4,168	4,047	.....	49.3	66.0	.....
PATENT MEDICINES AND COMPOUNDS.									
Primary power, total	2,994	2,081	(3)	25,677	18,542	(3)	100.0	100.0	(3)
Owned	210	340	.....	10,984	11,093	.....	42.8	59.8	.....
Rented	2,784	1,741	.....	14,693	7,449	.....	57.2	40.2	.....
Electric	3,635	2,310	.....	19,046	10,468	.....	100.0	100.0	.....
Rented	2,784	1,741	.....	14,425	7,233	.....	76.1	69.1	.....
Generated by establishment reporting	851	569	.....	4,621	3,235	.....	23.9	30.9	.....
PERFUMERY AND COSMETICS.									
Primary power, total	790	354	(3)	2,196	1,913	(3)	100.0	100.0	(3)
Owned	14	32	.....	329	709	.....	15.0	37.1	.....
Rented	776	322	.....	1,867	1,204	.....	85.0	62.9	.....
Electric	783	369	.....	1,886	1,326	.....	100.0	100.0	.....
Rented	776	322	.....	1,867	1,106	.....	99.0	83.4	.....
Generated by establishment reporting	7	47	.....	19	220	.....	1.0	16.6	.....

[1] Figures for horsepower include for 1909 the amount reported under the head "Other" owned power. [2] Not reported separately. [3] Figures not available.

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

STATE.	COAL. Anthracite[1] (tons, 2,240 lbs.).	COAL. Bituminous (tons, 2,000 lbs.).	Coke (tons, 2,000 lbs.).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
United States:						
The industrial group—						
1919	60,251	190,375	817	16,079	1,489	166,987
1914	60,504	142,656	459	5,640	(2)	512,736
Druggists' preparations—						
1919	15,486	78,976	29	171	414	46,340
1914	18,969	52,523	71	301	(2)	74,200
Patent medicines and compounds—						
1919	43,033	106,045	775	10,806	1,038	102,410
1914	39,158	87,366	378	5,333	(2)	425,142
Perfumery and cosmetics—						
1919	1,732	5,354	13	5,102	37	18,237
1914	2,377	2,767	10	6	(2)	13,394
California	.....	56	2	4,358	94	7,424
Connecticut	442	1,468	.....	.....	36	698
District of Columbia	20	42	.....	.....	.....	.....
Georgia	3	546	.....	3	.....	1,323
Illinois	519	16,702	553	575	8	5,179
Indiana	130	14,032	8	1	101	6,634
Iowa	577	3,585	1	8	167	1,040
Kansas	8	863	.....	24	20	4,043
Kentucky	1	12,249	.....	.....	.....	922
Louisiana	.....	7	4	.....	.....	134
Maine	126	25	.....	.....	.....	428
Maryland	264	4,307	.....	.....	20	2,259
Massachusetts	1,449	6,060	.....	229	.....	3,909
Michigan	86	34,577	12	4	158	1,349
Minnesota	552	3,102	10	.....	3	1,351
Missouri	148	9,604	68	363	63	5,008
Nebraska	.....	691	30	18	80	200
New Jersey	19,591	32,515	.....	5,352	13	3,058
New York	27,318	16,756	25	279	47	26,961
North Carolina	.....	214	5	.....	1	.....
Ohio	243	7,457	21	331	26	25,524
Pennsylvania	8,304	6,888	22	4	314	44,157
Rhode Island	39	.....	12	50	120	353
Tennessee	22	2,368	.....	.....	10	410
Texas	.....	94	.....	.....	91	686
Virginia	83	8,618	.....	2	.....	70
Washington	.....	198	22	601	10	132
Wisconsin	116	1,131	20	.....	13	16,405
All other states	210	6,220	2	3,877	94	6,330

[1] Includes some semianthracite.

[2] Included in figures for fuel oils.

SPECIAL STATISTICS.

Consumption of alkaloids and alcohol.—The establishments within these industries reported the consumption of alkaloids, alkaloid materials, and the alcohols, and this information is given in Table 11.

TABLE 11.—MATERIALS—CONSUMPTION OF ALKALOIDS AND ALCOHOL: 1919.

KIND.	Number of establishments.	Quantity.	Cost.
		Pounds.	
Alkaloids and alkaloid materials	.....	.....	[1]$9,759,061
Cinchona bark	100	2,363,000	1,592,926
Coca leaves	16	735,000	368,561
Opium	282	328,900	3,097,886
Alkaloids and salts thereof—			
Arecoline	6	7	6,764
Atropine	22	24	8,257
Berberine	8	15	591
Caffeine	253	39,414	312,285
Cinchonine	20	2,472	22,046
Cinchonidine	20	819	11,426
Cocaine	112	516	90,454
Codein	181	2,313	296,392
Colchicine	9	5	5,087
Emetine	6	30	10,283
Heroin	178	702	178,545
Hydrastine	11	8	2,785
Morphine	217	3,984	635,912
Nicotine	8	4,327	6,717
Pilocarpine	7	12	2,260
Quinine	439	183,517	2,718,238
Sparteine	6	11	1,786
Strychnine	282	16,419	372,304
Miscellaneous and unclassified	.....	125	17,556
Alcohol:		*Gallons.*	
Grain (ethyl)	1,434	2,962,842	14,379,871
Denatured	277	796,871	524,049
Wood (methyl)	105	73,208	106,147

[1] Includes cinchona bark, coca leaves, and opium to the amount of $3,359,990, consumed by establishments manufacturing alkaloids as subsidiary products.

This table shows the number of establishments reporting the purchase of the respective materials, and quantities and costs; but establishments in other industries manufacturing the distinctive products of these industries did not report the consumption of these materials, and the products of the outside establishments constitute a very considerable part of the total production of many of the alkaloids; hence the figures for these materials are not to be taken as representing the total consumption.

Production of alkaloids and derivatives.—Table 12 presents the statistics for the principal alkaloids in 1919. The figures give total production. The production of cocaine as reported by all establishments was 6,781 pounds, of which 5,377 pounds, or 80 per cent, were by establishments within the classified industry. The principal alkaloids derived from opium are morphine, codein, and heroin, and the production, as reported by all establishments, was 3,295 pounds of codein, 6,933 pounds of heroin, and 38,122 pounds of morphine, a total of 48,350 pounds of opium alkaloids.

TABLE 12.—PRODUCTS—ALKALOIDS AND DERIVATIVES: 1919.

KIND.	Production, pounds.	Made and consumed in same establishments, pounds.	PRODUCED FOR SALE. Pounds.	PRODUCED FOR SALE. Value.
Total	481,059	23,161	457,898	$15,416,028
Quinine	238,132	188	237,944	3,929,606
Opium products—				
Morphine	38,122	1,075	37,047	5,906,201
Heroin (diacetyl morphine)	6,933	.....	6,933	1,310,883
Codein	3,295	.....	3,295	473,322
Cocaine	6,781	.....	6,781	1,021,423
Caffeine	40,537	21,795	18,742	379,528
Strychnine	26,031	2	26,029	986,702
Other alkaloids and alkaloids not itemized	121,228	101	121,127	1,408,363

Products—Comparative summary and by states.—Table 13 gives comparative statistics for products, 1919 and 1914, classified according to industries and the character of products. Table 14 presents the statistics of products, by principal states, for 1919 and 1914.

TABLE 13.—PRODUCTS—COMPARATIVE SUMMARY: 1919 AND 1914.

	1919	1914
Number of establishments, total	3,839	4,092
The classified industries, establishments engaged primarily in the manufacture of:		
Druggists' preparations	524	416
Patent medicines and compounds	2,467	2,903
Perfumery and cosmetics	569	496
Other industries, establishments reporting as subsidiary products:		
Druggists' preparations	67	277
Patent medicines and compounds	151	
Perfumery and cosmetics	61	
Products, total value	$418,221,150	$176,747,080
The classified industries:		
Druggists' preparations	$114,593,486	$48,009,654
Patent medicines and compounds	$212,162,255	$102,463,374
Perfumery and cosmetics	$59,613,391	$16,899,101
Subsidiary products of other industries:		
Druggists' preparations	$21,839,202	$5,353,646
Patent medicines and compounds	$6,878,102	$3,202,057
Perfumery and cosmetics[1]	$3,134,714	$819,248
Alkaloids and derivatives	$15,416,028	$16,231,508
Synthetic preparations, including coal-tar medicinals	$8,899,533	[2] $1,384,996
Biological products (serums, vaccines, toxins, etc.):		
Number of establishments	[3] 94	98
Value	$15,876,358	$6,223,475
Other druggists' preparations (not patent or proprietary):		
Tinctures, fluid extracts, medicinal sirups, and other liquid preparations, not otherwise accounted for	$38,679,454	$13,900,402
Pills, tablets, powders, etc., not otherwise accounted for	$37,803,903	$10,903,056
Pharmaceutical metals and their salts	$420,952	$732,307
Patent and proprietary medicines:		
For sale in unbroken unit packages to the general public	$132,978,871	$83,455,264
Ethical pharmaceutical specialties	$29,494,936	
Patent and proprietary compounds	$46,351,234	$16,514,352
Perfumery, cosmetics, and toilet preparations[1]	$69,449,056	$19,160,407
Flavoring essences and extracts	$5,222,192	$8,241,318
All other products	$17,628,633	

[1] Not including "Perfumery and cosmetics" reported by soap manufacturers—$12,635,206 in 1919 and $6,804,508 in 1914.
[2] Synthetic preparations.
[3] Distributed as follows: Missouri, 14 establishments; Kansas, 14; Indiana, 10; Nebraska, 9; Iowa, 7; Illinois, 5; New York, 5; Pennsylvania, 5; Michigan, 4; Tennessee, 3; Texas, 3; 2 each in California, Colorado, New Jersey, and Oklahoma; and 1 each in District of Columbia, Kentucky, Minnesota, Ohio, South Dakota, Utah, and Wisconsin.

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

STATE.	Census year.	Number of establishments.	Total value of products.	DRUGGISTS' PREPARATIONS. Biological products, serums, vaccines, toxins, etc.	Tinctures, fluid extracts, medicinal sirups, etc., not otherwise accounted for.	Pills, tablets, powders, etc., not otherwise accounted for.	Alkaloids, synthetic preparations (including coal-tar medicinals, and pharmaceutical metals and their salts).	Patent and proprietary medicines.	Patent and proprietary compounds.	Toilet preparations, perfumery, and cosmetics.	All other products.
United States	1919	3,839	$418,221,150	$15,876,358	$38,679,454	$37,803,903	$24,736,513	$162,473,807	$46,351,234	$69,449,056	$22,850,826
	1914	4,092	176,747,080	6,223,475	13,900,402	10,903,056	18,348,806	83,455,264	16,514,352	19,160,407	8,241,318
Per cent of increase			136	155	179	247	35	95	181	262	177
Alabama	1919	28	419,846	.....	53,130	(1)	(1)	254,774	52,105	45,445	(1)
	1914	32	230,628	.....	24,520	(1)	(1)	159,005	21,629	7,625	220
California	1919	148	4,407,222	379,452	139,905	415,650	(1)	1,256,105	1,297,407	704,712	(1)
	1914	142	2,519,741	(1)	84,847	379,504	(1)	1,080,774	427,331	274,298	111,030
Illinois	1919	333	41,714,235	345,762	1,924,771	4,461,279	118,513	15,646,594	7,859,460	10,095,574	1,262,282
	1914	391	15,580,958	160,619	491,399	1,053,753	157,229	7,966,158	2,799,881	1,852,055	1,099,864
Indiana	1919	124	14,119,227	1,820,628	2,815,949	2,244,430	150,363	5,090,226	510,217	321,909	1,165,505
	1914	162	5,766,270	209,132	1,707,914	1,283,160	(1)	2,179,637	219,896	98,700	(1)
Iowa	1919	120	10,800,656	2,026,791	134,510	548,874	.....	5,312,249	286,433	1,435,263	1,056,536
	1914	99	4,868,245	503,191	88,893	10,850	(1)	3,025,574	249,789	590,129	(1)
Maryland	1919	80	15,880,471	.....	476,916	5,808,163	5,218	6,675,741	619,477	564,054	1,730,902
	1914	89	6,445,569	.....	1,088,504	381,204	(1)	3,526,967	440,362	452,196	(1)
Massachusetts	1919	154	21,999,285	.....	2,666,636	1,423,188	.....	10,055,491	3,807,031	3,749,579	297,360
	1914	179	8,630,115	.....	459,859	485,534	344,708	4,980,881	1,075,128	1,220,523	63,482
Michigan	1919	112	35,576,067	1,703,473	8,360,209	6,359,328	701,483	10,255,031	1,245,843	3,582,427	3,368,278
	1914	155	16,518,480	1,364,893	706,389	1,108,646	(1)	3,710,705	316,470	991,538	(1)
Minnesota	1919	81	7,312,060	(1)	(1)	1,904	300	3,389,623	1,059,591	905,907	1,545,226
	1914	107	4,926,555	(1)	12,085	633	(1)	2,834,458	397,928	514,549	1,067,262
Missouri	1919	210	24,117,769	799,531	1,360,681	1,190,585	2,642,776	14,381,023	1,497,139	1,638,899	607,135
	1914	236	10,713,205	376,875	774,638	208,897	(1)	6,009,810	736,965	805,585	(1)
New Jersey	1919	142	23,008,622	(1)	(1)	1,386,628	3,949,324	6,090,947	3,847,210	4,579,407	2,003,654
	1914	136	8,654,192	.....	114,269	1,221,769	1,229,602	3,373,046	1,458,709	816,199	440,598
New York	1919	733	109,504,004	1,316,149	9,253,067	8,129,173	8,187,864	41,724,974	9,723,949	26,708,960	4,459,868
	1914	852	43,057,468	312,744	4,835,653	1,548,835	2,107,225	21,388,575	3,569,503	7,507,864	1,792,069
Ohio	1919	288	19,734,075	(1)	(1)	964,343	12,484	8,211,951	3,515,340	4,532,300	780,480
	1914	268	7,983,411	.....	732,665	324,231	(1)	4,513,034	1,062,373	841,555	(1)
Pennsylvania	1919	359	35,515,359	1,810,650	6,210,615	3,717,349	8,791,368	9,122,961	2,298,466	2,103,072	1,460,878
	1914	354	17,828,762	1,647,664	1,653,525	2,550,700	3,851,696	5,923,204	954,154	848,704	899,115
Tennessee	1919	101	11,252,844	148,353	1,106,514	363,193	26,780	6,566,542	510,653	1,726,681	804,128
	1914	86	5,015,227	(1)	474,985	113,579	(1)	3,325,871	106,057	436,690	490,645
Wisconsin	1919	66	2,766,646	(1)	267,912	37,574	(1)	1,039,487	353,745	795,533	(1)
	1914	63	1,443,730	12,766	23,376	42,578	66,014	839,128	72,930	255,990	180,942
All other states	1919	760	40,092,762	4,974,622	740,643	752,269	150,040	17,400,088	7,867,168	5,959,334	2,248,598
	1914	741	16,564,524	1,035,591	626,881	189,183	315,778	8,623,437	2,605,241	1,848,207	2,648,082

[1] Included in "All other states."

GENERAL TABLES.

Table 15 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, for the industrial group and for the component industries, and by states for the group. Table 16 is a detailed statement, by states, for the census of 1919, for the three branches of the industry.

TABLE 15.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States: The industrial group	1919	3,560	38,417	40,571	$29,894	$170,105	$386,369
	1914	3,815	25,502	28,872	12,710	66,340	107,372
	1909	3,642	22,895	25,659	9,897	50,376	141,942
Druggists' preparations.	1919	524	15,568	12,698	12,162	55,139	114,594
	1914	416	9,277	8,417	4,755	22,935	48,010
	1909	375	9,490	9,580	4,159	17,847	43,959
Patent medicines and compounds.	1919	2,467	17,444	25,677	13,749	88,819	212,162
	1914	2,903	13,328	18,542	6,675	35,940	102,463
	1909	2,838	11,030	14,704	4,744	26,895	83,771
Perfumery and cosmetics.	1919	569	5,405	2,196	3,983	26,147	59,613
	1914	496	2,897	1,913	1,280	7,465	16,899
	1909	429	2,375	1,375	994	5,634	14,212
California	1919	137	577	723	507	1,946	4,151
	1914	126	328	598	180	1,187	2,496
	1909	89	310	347	148	639	1,549
Connecticut	1919	38	431	485	295	1,566	4,775
	1914	43	327	206	125	764	2,063
	1909	64	237	381	88	488	1,312
Georgia	1919	54	244	142	131	1,068	3,681
	1914	45	155	206	63	592	1,219
	1909	50	210	84	81	442	1,421
Illinois	1919	314	2,812	3,905	2,436	16,789	39,059
	1914	363	1,844	2,573	1,046	5,097	15,032
	1909	359	1,869	3,234	805	4,413	13,114
Indiana	1919	118	1,877	1,518	1,125	6,195	14,036
	1914	156	864	998	415	2,095	5,740
	1909	113	801	809	354	1,460	4,344
Iowa	1919	114	746	1,129	658	4,655	10,658
	1914	94	418	642	229	1,667	4,828
	1909	100	358	503	133	1,065	3,401
Kentucky	1919	38	256	307	142	749	2,327
	1914	45	376	838	149	755	2,163
	1909	49	280	447	93	756	2,123
Louisiana	1919	25	171	42	84	423	1,006
	1914	25	65	46	21	132	401
	1909	21	111	68	29	134	363
Maryland	1919	76	1,461	1,936	1,018	8,430	15,806
	1914	83	1,053	1,424	432	2,389	5,970
	1909	83	1,193	683	429	2,167	5,548
Massachusetts	1919	139	2,390	1,981	$1,905	$8,612	$20,327
	1914	162	1,381	1,586	696	3,323	8,263
	1909	154	1,183	1,376	566	2,727	7,432
Michigan	1919	107	4,751	2,642	4,151	14,690	34,945
	1914	142	3,369	2,694	1,994	7,003	16,434
	1909	159	3,249	2,270	1,509	4,941	13,475
Minnesota	1919	75	646	2,345	414	3,159	7,270
	1914	99	613	945	285	2,341	4,879
	1909	101	475	741	188	1,690	4,412
Missouri	1919	201	1,786	2,058	1,280	8,376	21,325
	1914	212	1,090	867	532	2,926	9,010
	1909	185	980	908	415	2,536	7,639
New Jersey	1919	112	2,420	3,207	1,652	10,441	18,715
	1914	129	1,271	2,223	616	3,147	7,673
	1909	111	1,005	1,478	432	2,089	5,410
New York	1919	680	9,218	8,975	7,180	45,437	101,457
	1914	806	5,699	5,549	2,977	16,912	41,796
	1909	743	4,728	5,423	2,226	12,589	37,343
North Carolina	1919	31	213	198	153	1,597	4,891
	1914	26	74	17	27	260	512
	1909	26	60	28	18	216	474
Ohio	1919	267	1,695	1,670	1,297	7,417	18,922
	1914	252	1,032	1,949	479	3,018	7,734
	1909	261	905	1,568	385	1,888	5,859
Pennsylvania	1919	332	3,399	3,603	2,987	11,251	26,374
	1914	324	2,833	2,495	1,233	6,474	14,721
	1909	367	2,761	2,619	1,145	5,310	12,656
Tennessee	1919	93	1,001	1,041	549	4,892	11,092
	1914	82	648	802	249	1,824	4,942
	1909	76	433	418	148	1,341	3,515
Texas	1919	68	301	108	208	997	2,506
	1914	61	116	97	52	288	740
	1909	59	145	51	62	411	1,014
Washington	1919	30	47	101	60	220	510
	1914	32	45	94	21	142	273
	1909	18	38	95	19	106	258
Wisconsin	1919	61	232	223	172	1,105	2,644
	1914	62	278	275	131	510	1,442
	1909	62	269	219	118	445	1,707
All other states	1919	450	1,740	2,232	1,490	10,090	19,892
	1914	446	1,623	1,748	738	3,494	9,041
	1909	392	1,295	1,909	506	2,523	7,543

TABLE 16.—DETAILED STATEMENT,

	STATE.	Number of establishments	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male.	Under 16. Female.	Capital.
	THE INDUSTRIAL GROUP.															Dollars.
1	United States	3,560	63,985	2,304	5,156	10,141	7,967	38,417	.....	.....	40,749	18,509	21,501	284	455	278,294,601
	DRUGGISTS' PREPARATIONS.															
2	United States	524	22,569	283	1,871	3,032	2,315	15,558	Fe 16,359	Je 14,941	15,877	7,667	7,981	101	128	102,129,257
3	California	15	284	11	18	20	13	222	Ja 235	Oc 208	233	90	143	.....	.....	1,007,686
4	Connecticut	6	35	.....	7	4	3	21	Fe 34	No 14	27	20	7	.....	.....	245,758
5	District of Columbia	3	47	.....	10	.....		32	Mh [3] 35	Au 26	31	8	13	3	7	244,434
6	Georgia	5	72	1	7	8	2	54	My [3] 55	Ja [3] 53	53	13	40	.....	.....	141,012
7	Illinois	31	979	15	68	214	179	503	Ja 581	Je 425	501	299	196	3	3	3,676,433
8	Indiana	25	1,844	15	81	118	221	1,409	Ja 1,617	Au 1,289	1,338	633	705	.....	.....	6,598,250
9	Iowa	15	374	7	59	55	28	234	Jy 258	Fe 205	251	192	59	.....	.....	1,606,666
10	Kansas	17	285	9	60	20	12	184	Jy 236	De 123	144	137	7	.....	.....	1,401,906
11	Kentucky	6	22	4	3	1	.....	14	(4) 14	(4) 14	16	4	12	.....	.....	45,688
12	Louisiana	3	18	3	2	.....	1	12	(4) 12	(4) 12	12	7	3	2	.....	22,656
13	Maine	3	19	3	.....	.....	1	15	(4) 15	(4) 15	15	5	10	.....	.....	83,322
14	Maryland	13	1,198	11	75	294	122	696	No 756	Au 636	703	191	503	3	6	4,491,553
15	Massachusetts	24	2,573	7	125	295	447	1,699	Fe 2,097	Au 1,446	1,848	864	952	16	16	15,396,709
16	Michigan	16	3,991	7	112	326	327	3,219	No 3,317	Ap 3,145	3,309	1,459	1,850	.....	.....	26,343,212
17	Minnesota	6	217	2	33	6	34	142	Jy [3] 152	Ja 123	148	51	97	.....	.....	1,075,297
18	Missouri	36	977	24	102	133	72	646	Oc [3] 666	Je 618	661	370	287	3	1	3,253,439
19	Nebraska	11	161	2	27	32	11	89	Ap [3] 130	No [3] 47	70	32	7	29	2	1,481,522
20	New Jersey	16	1,204	6	86	99	109	994	Ja 1,184	Je 872	997	526	416	10	45	3,400,974
21	New York	98	3,358	45	263	559	281	2,210	My 2,279	De [3] 2,119	2,251	1,084	1,146	14	27	11,759,796
22	North Carolina	4	6	5	.....	.....	.....	1	(4) 1	(4) 1	1	.....	1	.....	.....	4,075
23	Ohio	29	835	21	46	142	101	525	Mh 624	No 478	493	219	274	.....	.....	2,466,992
24	Pennsylvania	62	3,235	34	97	586	303	2,215	Oc 2,312	Je 2,045	2,298	1,217	1,042	18	21	13,128,030
25	Rhode Island	8	36	7	3	8	3	15	Ap 20	Mh 11	18	14	4	.....	.....	97,630
26	Tennessee	16	276	14	37	65	24	136	No 160	Fe 109	159	77	82	.....	.....	2,709,340
27	Texas	9	145	1	16	14	5	109	Se 132	Ja 74	115	54	61	.....	.....	400,333
28	Virginia	9	34	7	7	2	.....	18	Oc 20	Fe 16	20	8	12	.....	.....	80,841
29	Washington	7	29	8	1	.....	.....	20	Se 23	Fe [3] 18	22	15	7	.....	.....	90,516
30	Wisconsin	6	46	2	8	2	1	33	(4) 33	(4) 33	33	26	7	.....	.....	228,810
31	All other states [5]	25	179	12	27	29	10	101	.....	.....	110	72	38	.....	.....	646,368
	PATENT MEDICINES AND COMPOUNDS.															
32	United States	2,467	31,970	1,648	3,025	5,915	3,938	17,444	No 18,165	Jy 16,607	18,796	9,002	9,418	137	239	143,498,611
33	Alabama	22	93	12	17	17	4	43	Jy 57	Ja [3] 29	56	28	27	1	.....	199,409
34	Arkansas	23	105	33	7	5	7	53	Fe [3] 58	Je 49	57	30	27	.....	.....	97,930
35	California	90	550	66	74	60	74	276	Ja 317	Je 258	307	160	147	.....	.....	1,914,287
36	Colorado	25	82	5	13	11	14	39	No [3] 51	Ap 29	55	26	29	.....	.....	227,128
37	Connecticut	26	282	18	28	36	38	162	No 195	Ap 145	194	142	52	.....	.....	1,277,572
38	District of Columbia	15	107	10	11	14	22	50	Oc [3] 55	Je 45	51	21	30	.....	.....	158,530
39	Florida	24	113	21	10	14	10	58	De 64	Ja 53	62	20	42	.....	.....	561,831
40	Georgia	43	334	34	47	49	37	167	No 186	Jy 136	185	81	103	1	.....	909,007
41	Illinois	208	3,696	124	301	964	708	1,599	De 1,666	Ap 1,530	1,675	842	768	18	47	16,991,395
42	Indiana	83	749	53	83	109	84	420	De 494	Ap 363	516	158	340	1	17	1,760,098
43	Iowa	90	1,541	68	131	776	173	393	Se 418	Ja 363	429	239	185	1	4	4,215,997
44	Kansas	27	122	23	15	21	22	41	No 45	Jy [3] 37	42	17	23	.....	2	1,089,553
45	Kentucky	28	355	17	31	49	30	228	Ap 271	Oc 158	209	148	60	.....	1	1,512,655
46	Louisiana	17	176	10	28	18	9	111	De 132	My 100	132	41	66	16	9	418,718
47	Maine	19	63	17	5	4	7	30	Se 37	Mh 23	39	17	22	.....	.....	227,633
48	Maryland	55	1,054	43	72	145	95	699	Oc 735	Je 663	734	318	378	15	23	5,180,925
49	Massachusetts	97	1,072	56	115	118	179	604	No 686	Je 522	659	397	250	7	5	5,384,296
50	Michigan	70	2,146	41	223	248	242	1,392	No 1,501	Jy 1,256	1,485	645	838	.....	2	6,627,919
51	Minnesota	51	906	29	82	175	159	461	Jy 541	Ja 396	444	201	237	3	3	7,939,775
52	Mississippi	8	16	7	2	.....	1	6	Fe [3] 7	Au [3] 5	6	1	5	.....	.....	12,682
53	Missouri	142	2,098	79	207	513	259	1,040	Oc [3] 1,112	Jy 961	1,114	432	644	13	25	7,919,699
54	Montana	4	13	2	2	6	.....	3	Ja 11	Jy [3] 1	11	8	3	.....	.....	21,392
55	Nebraska	29	252	27	25	59	34	107	Je 131	No 83	111	85	25	.....	1	1,547,818
56	New Hampshire	6	19	3	4	.....	1	11	Jy [3] 12	Ja [3] 10	9	6	3	.....	.....	42,963
57	New Jersey	81	1,487	38	117	185	126	1,021	Mh 1,087	Jy 902	1,102	609	407	27	59	10,097,400
58	New York	403	7,429	193	706	1,172	812	4,546	Fe 5,125	Jy 4,122	4,808	2,186	2,576	11	35	37,889,917
59	North Carolina	27	379	16	32	96	23	212	De 220	Ja 204	218	57	160	1	.....	2,001,156
60	Ohio	202	1,705	128	171	309	208	889	De 1,026	Je [3] 818	1,036	512	520	2	2	6,534,040
61	Oklahoma	17	133	23	8	29	9	64	De 78	Ap 59	88	13	75	.....	.....	393,317
62	Oregon	16	197	28	25	26	19	99	Oc 126	My 88	96	24	72	.....	.....	1,955,850
63	Pennsylvania	234	1,773	217	171	201	195	989	Oc 1,055	Au 936	1,055	525	519	11	.....	7,675,618
64	Rhode Island	15	60	10	6	9	12	23	De 34	My [3] 20	28	24	3	1	.....	143,437
65	South Carolina	8	24	6	3	2	2	11	De 14	Ap 9	12	7	5	.....	.....	61,382
66	Tennessee	67	1,325	47	97	240	176	765	De 828	Fe 716	854	364	486	2	2	5,167,128

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

BY STATES: 1919.

EXPENSES.										POWER.							
Salaries and wages.				Rent and taxes.		For materials.				Primary horsepower.						Electric horsepower generated in establishments reporting.	
											Owned.						
Officials.	Clerks, etc.	Wage earners.	For contract work.	Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.	Value of products.	Value added by manufacture.	Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.[1]	Rented.[2]		
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*								
19,491,811	24,992,898	29,893,754	1,107,217	2,603,135	21,372,912	168,209,030	1,895,888	386,369,132	216,264,214	40,571	18,182	531	951	55	20,852	8,808	1
4,899,050	8,419,436	12,161,925	78,918	499,513	5,297,386	54,451,977	686,498	114,593,486	59,455,011	12,698	7,731	500	178	2	4,292	4,168	2
57,994	44,113	181,549	840	16,765	50,992	697,386	5,566	1,187,841	484,889	95	.....	.....	7	.....	88	29	3
9,420	9,055	18,207	.....	2,010	1,319	46,454	3,948	71,324	20,922	128	110	.....	.....	.....	18	.....	4
29,940	5,800	23,405	.....	2,066	1,692	181,620	797	313,692	131,275	16	.....	.....	.....	.....	16	.....	5
23,861	20,070	28,097	.....	3,202	4,282	207,334	409	433,590	225,847	9	.....	.....	.....	.....	9	.....	6
260,501	505,445	446,461	105	47,712	196,094	2,071,500	41,667	4,888,548	2,775,381	915	671	.....	33	.....	211	361	7
304,797	637,075	775,487	20,141	21,656	340,681	4,579,350	62,427	9,257,192	4,615,415	1,031	635	.....	4	.....	392	506	8
172,741	175,798	266,330	1,050	19,009	104,400	1,996,225	14,894	3,070,077	1,058,958	161	.....	.....	10	.....	151	.....	9
173,706	39,406	233,697	885	14,008	67,847	2,753,071	9,463	3,694,847	932,313	106	10	.....	6	.....	90	.....	10
5,030	150	6,690	.....	1,770	278	36,365	250	69,468	32,853	8	.....	.....	.....	.....	8	.....	11
2,380	200	9,596	150	1,100	637	14,090	175	43,769	29,504	3	.....	.....	.....	.....	3	.....	12
.....	1,300	6,532	.....	515	1,182	34,026	306	61,475	27,143	1	.....	.....	.....	.....	1	.....	13
240,691	640,878	461,614	108	20,256	208,938	3,340,882	20,995	6,406,804	3,044,927	704	625	.....	.....	.....	79	433	14
761,357	812,636	1,307,006	420	22,061	784,156	4,913,010	39,859	9,989,720	5,036,851	757	610	.....	.....	.....	147	508	15
549,113	1,180,893	2,830,077	.....	14,441	2,207,430	9,880,817	115,376	23,903,856	13,907,663	1,471	540	500	.....	.....	431	50	16
72,933	40,608	86,040	.....	8,961	5,102	252,765	5,439	618,798	360,594	87	40	.....	.....	.....	47	6	17
226,134	319,692	332,861	212	21,572	99,176	2,565,586	24,000	4,831,651	2,242,065	1,060	901	.....	8	2	149	345	18
71,594	73,188	89,999	.....	9,552	20,515	326,705	6,926	928,975	595,344	93	10	.....	22	.....	61	.....	19
183,970	237,088	502,737	.....	4,669	74,282	3,012,482	78,662	5,334,918	2,243,774	1,436	565	.....	8	.....	863	314	20
921,962	1,471,372	1,823,187	43,858	206,107	547,725	8,500,728	120,436	18,000,192	9,379,028	2,113	1,439	.....	.....	.....	674	515	21
.....	.....	1,134	.....	100	19	2,695	69	7,918	5,154	.....	.....	.....	.....	.....	.....	.....	22
148,943	359,605	395,284	.....	10,248	56,440	1,773,505	15,999	3,941,307	2,151,803	422	135	.....	7	.....	280	14	23
403,020	1,605,777	1,997,516	2,715	25,500	304,139	4,719,348	89,077	12,606,051	7,797,626	1,821	1,425	.....	41	.....	355	1,086	24
5,115	20,030	11,610	.....	3,021	1,514	52,196	1,260	119,727	66,271	14	.....	.....	.....	.....	14	.....	25
124,745	108,506	83,552	.....	1,986	47,429	1,187,640	5,129	1,893,092	700,323	54	.....	.....	.....	.....	54	.....	26
46,126	58,275	88,701	7,229	2,149	27,840	177,906	2,738	770,506	589,862	46	.....	.....	13	.....	33	.....	27
9,320	5,985	14,609	.....	2,600	8,480	44,299	1,543	129,314	83,472	.....	.....	.....	.....	.....	.....	.....	28
2,000	.....	22,862	1,205	700	428	87,417	1,743	283,475	194,315	12	.....	.....	12	.....	.....	.....	29
26,900	3,600	35,969	.....	5,355	16,080	135,763	12,345	347,117	199,009	63	15	.....	.....	.....	48	1	30
64,757	42,831	81,116	.....	10,422	28,289	860,812	5,000	1,388,242	522,430	72	.....	.....	2	.....	70	.....	31
11,554,701	13,181,511	13,748,813	803,210	1,471,482	14,103,226	87,732,309	1,087,108	212,162,255	123,342,838	25,677	10,156	31	744	53	14,693	4,621	32
32,791	33,832	26,101	75	6,208	6,122	103,744	511	297,540	193,285	15	.....	.....	.....	.....	15	.....	33
13,100	10,058	45,404	300	6,026	875	106,280	945	258,242	151,017	20	.....	.....	.....	.....	20	.....	34
159,676	142,389	246,108	2,409	41,222	109,784	985,566	14,999	2,382,734	1,382,169	597	132	.....	2	.....	463	.....	35
23,912	17,926	30,008	1,198	8,376	9,135	93,281	1,505	262,109	167,323	27	.....	.....	.....	.....	27	.....	36
249,714	72,453	158,934	1,044	8,621	94,062	343,990	16,418	1,985,223	1,624,815	184	.....	.....	.....	.....	184	.....	37
24,952	10,783	25,690	441	9,365	49,438	98,793	834	480,411	380,784	102	40	.....	.....	.....	62	7	38
17,859	35,749	35,009	.....	7,801	15,244	386,854	489	738,214	350,871	34	15	.....	14	.....	5	.....	39
94,496	98,836	91,034	3,375	13,481	148,050	686,957	5,977	2,888,284	2,195,350	122	60	.....	12	.....	50	2	40
1,511,586	2,418,493	1,217,052	425,236	163,072	1,270,437	11,153,418	101,018	25,395,228	14,140,792	2,642	720	.....	83	1	1,838	817	41
293,061	197,814	327,920	19,472	25,895	180,777	1,366,529	16,827	4,481,247	3,097,891	469	140	.....	10	.....	319	200	42
264,503	1,180,392	332,404	3,476	26,606	174,596	1,933,126	20,776	6,348,551	4,394,649	864	185	.....	73	.....	606	93	43
112,560	64,058	32,798	2,075	4,569	39,373	181,918	3,145	513,381	328,318	46	.....	.....	2	.....	44	.....	44
98,088	80,922	128,181	75	7,202	651,159	642,928	43,350	2,209,571	1,523,293	296	280	.....	.....	.....	16	.....	45
99,306	30,410	50,879	.....	7,014	64,122	314,076	1,151	786,408	471,181	24	.....	.....	.....	.....	24	.....	46
23,236	8,873	19,930	.....	4,175	7,551	112,103	1,598	312,342	198,641	27	.....	.....	.....	.....	27	.....	47
316,443	360,953	524,700	3,008	14,614	612,356	4,755,072	30,915	8,878,122	4,092,135	1,210	105	.....	9	.....	1,096	.....	48
481,893	370,279	530,058	23,570	65,542	746,304	3,019,198	38,149	9,107,958	6,050,611	1,196	636	.....	129	20	411	50	49
660,907	683,520	1,204,359	11,612	49,883	333,938	4,143,426	69,380	9,948,329	5,735,523	1,026	610	.....	3	.....	413	842	50
308,258	453,160	295,073	9,909	34,621	448,773	2,696,968	25,095	6,302,629	3,580,566	2,234	6	.....	7	.....	2,221	.....	51
4,200	600	2,552	.....	660	305	11,728	86	29,499	17,685	.....	.....	.....	.....	.....	.....	.....	52
798,182	1,147,376	886,379	10,565	104,561	1,574,892	5,145,822	44,996	14,590,676	9,399,858	895	267	.....	55	.....	573	103	53
2,100	2,000	2,675	3,000	90	212	15,317	226	34,943	19,400	8	.....	.....	7	.....	1	.....	54
56,737	110,062	90,562	116,167	11,831	19,557	458,711	5,742	1,111,298	646,845	242	8	.....	25	10	199	.....	55
6,038	1,752	9,349	3,309	1,700	1,305	17,462	1,554	59,760	40,744	5	.....	.....	.....	.....	5	.....	56
440,742	394,971	829,990	8,464	34,303	171,827	5,028,284	131,965	8,548,141	3,387,892	1,705	1,197	.....	93	.....	415	407	57
3,281,276	2,535,672	3,676,076	87,712	507,084	4,277,653	24,377,522	263,777	57,957,977	33,316,678	6,230	3,631	31	43	5	2,520	1,511	58
176,665	162,691	151,936	17,181	5,033	779,206	1,592,479	2,112	4,883,436	3,288,845	198	.....	.....	.....	5	193	.....	59
550,689	680,054	688,601	8,051	75,092	556,002	4,296,307	50,481	10,860,925	6,514,137	1,069	422	.....	14	1	632	261	60
18,514	66,551	30,809	1,500	4,165	5,899	218,450	900	454,577	235,227	23	.....	.....	1	.....	22	.....	61
95,306	51,980	90,605	15	8,436	25,861	574,032	5,480	1,063,828	484,316	162	86	.....	.....	10	66	.....	62
547,193	577,258	867,263	17,249	103,539	464,051	5,545,753	66,562	11,913,284	6,300,969	1,632	759	.....	139	.....	734	130	63
9,229	16,717	20,656	84	5,140	1,966	81,993	3,777	214,880	129,110	15	.....	.....	.....	.....	15	.....	64
8,000	4,050	6,049	.....	3,390	1,827	98,955	105	160,403	61,343	6	.....	.....	.....	.....	6	.....	65
461,503	720,306	405,045	1,029	25,948	653,259	3,294,105	20,588	8,274,714	4,960,021	935	100	.....	.....	.....	835	.....	66

[1] Same number reported throughout the year.

[2] All other states embrace: Alabama, 3 establishments; Arkansas, 1; Colorado, 3; Mississippi, 1; Montana, 1; New Hampshire, 3; North Dakota, 1; Oklahoma, 4; South Carolina, 3; South Dakota, 1; West Virginia, 2; Utah, 1; Vermont, 1.

TABLE 16.—DETAILED STATEMENT,

	STATE.	Number of establishments	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male.	Under 16. Female.	Capital.
	PATENT MEDICINES AND COMPOUNDS—continued.															Dollars.
1	Texas	52	340	64	32	49	18	177	Je 214	De 119	226	166	58	2	.....	736,690
2	Utah	9	31	3	3	1	1	23	Je 25	Fe [3] 22	25	15	10	.....	.....	63,069
3	Vermont	14	238	4	22	52	22	138	Fe 146	Ap 119	138	58	80	.....	.....	1,428,110
4	Virginia	39	424	18	32	44	29	301	My 347	Oc 201	300	217	81	2	.....	1,551,762
5	Washington	15	39	5	6	2	3	23	Mh 36	Jy [3] 14	38	36	1	.....	1	183,127
6	West Virginia	9	30	6	2	8	2	12	De [3] 14	Jy [3] 11	14	4	10	.....	.....	82,507
7	Wisconsin	50	310	43	43	34	66	124	Mh 142	Au 111	125	71	51	2	1	968,287
8	All other states [4]	7	102	1	16	45	6	34	.....	.....	51	51	.....	.....	.....	326,556
	PERFUMERY AND COSMETICS.															
9	United States	569	9,446	373	760	1,194	1,714	5,405	No 6,162	Ja 4,721	6,076	1,840	4,102	46	88	32,666,633
10	California	32	162	32	18	9	24	79	No [3] 86	Ja 63	106	39	67	.....	.....	372,393
11	Colorado	3	9	3	1	.....	1	4	(5) 4	(5) 4	5	2	3	.....	.....	46,037
12	Connecticut	6	327	2	18	39	20	248	De 288	Ja 205	287	59	207	3	18	1,847,554
13	Georgia	6	59	5	11	11	9	23	Se [3] 26	Ja [3] 20	21	9	12	.....	.....	165,195
14	Illinois	75	1,390	40	129	112	399	710	De 815	Ja 605	815	207	574	10	24	4,371,602
15	Indiana	10	66	6	8	3	1	48	Se [3] 49	De 28	50	15	22	.....	13	118,219
16	Iowa	9	225	10	19	61	16	119	De 137	My 109	137	26	111	.....	.....	730,555
17	Kentucky	4	19	3	.....	.....	2	14	(5) 14	(5) 14	14	6	8	.....	.....	13,097
18	Louisiana	5	77	3	10	10	6	48	Mh [3] 51	Je [3] 45	51	13	35	1	2	210,117
19	Maryland	8	124	4	10	17	27	66	No [3] 72	Ja [3] 54	72	14	58	.....	.....	215,785
20	Massachusetts	18	142	11	17	17	10	87	Ja 95	Fe 80	88	26	58	4	.....	571,230
21	Michigan	21	222	11	25	14	32	140	Oc 169	Ja 101	163	60	97	4	2	565,248
22	Minnesota	18	197	8	10	121	15	43	Se 50	Fe [3] 35	52	23	28	.....	1	172,401
23	Missouri	23	284	16	18	31	119	100	No 107	Au 89	102	25	77	.....	.....	1,079,869
24	New Jersey	15	513	3	35	35	35	405	No 448	Fe 376	418	167	249	2	.....	3,563,388
25	New York	179	3,978	112	282	498	624	2,462	No 2,878	Ja 2,125	2,749	864	1,847	19	19	13,704,509
26	Ohio	36	657	30	62	126	158	281	No 364	Ja 196	367	93	272	1	1	1,778,353
27	Oklahoma	3	12	2	2	1	1	6	(5) 6	(5) 6	7	3	2	1	1	54,596
28	Pennsylvania	36	406	33	29	37	112	195	No 207	Ja 178	210	59	146	1	4	1,202,672
29	Rhode Island	4	5	3	.....	.....	.....	2	(5) 2	(5) 2	3	2	21	.....	.....	8,042
30	Tennessee	10	145	3	13	13	13	103	Oc [3] 115	Ja 92	108	35	73	.....	.....	362,072
31	Texas	7	40	3	9	12	1	15	Au 18	Ja [3] 13	15	7	8	.....	.....	120,849
32	Washington	8	11	4	2	1	.....	4	De 6	Mh 2	6	3	3	.....	.....	14,614
33	Wisconsin	5	143	4	10	15	39	75	No 87	Je 51	86	17	66	.....	3	386,749
34	All other states [6]	28	233	22	22	11	50	128	.....	.....	144	66	78	.....	.....	991,487

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

BY STATES: 1919—Continued.

EXPENSES.										POWER.							
Salaries and wages.				Rent and taxes.		For materials.				Primary horsepower.						Electric horsepower generated in establishments reporting.	
											Owned.						
Officials.	Clerks, etc.	Wage earners.	For contract work.	Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.	Value of products.	Value added by manufacture.	Total.	Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Water power.[1]	Rented.[2]		
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*								
64,049	84,446	107,583	19,796	15,654	32,072	645,875	1,162	1,455,162	808,125	58	.....	.....	11	.....	47	.....	1
3,650	2,100	13,214	450	1,795	864	82,884	1,031	116,413	32,498	87	.....	.....	.....	.....	87	.....	2
56,542	78,297	82,961	.....	1,130	222,935	904,526	14,587	1,948,703	1,029,590	18	.....	.....	2	.....	16	130	3
64,952	97,413	262,444	.....	20,558	325,191	831,411	31,036	1,871,789	1,009,342	570	500	.....	.....	1	69	8	4
5,575	6,016	32,864	.....	2,682	2,236	107,271	5,078	189,494	77,145	87	77	.....	.....	.....	10	.....	5
1,650	18,480	15,340	271	3,168	1,339	153,956	484	269,172	114,732	2	.....	.....	.....	.....	2	.....	6
82,275	106,162	101,101	1,032	22,662	21,696	673,670	7,145	1,516,296	835,481	140	.....	.....	10	.....	130	.....	7
33,233	45,657	53,117	.....	7,068	1,275	451,569	35,152	1,060,362	573,641	455	180	.....	.....	.....	275	.....	8
3,038,060	3,391,951	3,983,016	225,089	632,140	1,972,300	26,024,744	122,282	59,613,391	33,466,365	2,196	295	.....	34	.....	1,867	19	9
28,770	27,671	79,774	500	18,502	3,961	240,190	2,486	580,901	338,225	31	.....	.....	.....	.....	31	.....	10
1,200	480	1,846	.....	900	881	13,089	201	24,032	10,742	4	.....	.....	.....	.....	4	.....	11
67,587	66,770	118,191	.....	4,300	48,331	1,148,817	5,999	2,718,711	1,563,895	173	105	.....	.....	.....	68	19	12
30,600	25,074	11,776	.....	5,720	15,403	166,055	1,214	358,843	191,574	11	.....	.....	.....	.....	11	.....	13
516,200	471,781	772,710	3,107	91,021	283,650	3,405,086	16,345	8,775,561	5,354,130	348	.....	.....	.....	.....	348	.....	14
22,398	4,206	21,621	.....	3,872	2,404	168,550	953	297,405	127,902	18	.....	.....	.....	.....	18	.....	15
53,950	117,013	59,301	.....	6,880	14,950	685,985	4,459	1,239,587	549,143	104	30	.....	.....	.....	74	.....	16
.....	1,664	6,759	69	1,007	98	25,668	145	48,060	22,247	3	.....	.....	.....	.....	3	.....	17
10,055	9,045	23,066	.....	3,300	3,013	93,514	296	176,319	82,509	15	.....	.....	.....	.....	15	.....	18
25,025	39,410	31,450	.....	4,561	4,102	279,335	2,369	521,491	239,787	22	.....	.....	.....	.....	22	.....	19
48,854	43,202	68,265	1,250	13,307	133,543	600,922	900	1,229,460	627,638	28	.....	.....	.....	.....	28	.....	20
79,524	59,934	116,688	135	20,511	32,201	474,034	7,268	1,092,499	611,197	145	30	.....	.....	.....	115	.....	21
14,424	21,315	33,206	1,964	12,101	5,154	176,054	2,388	348,293	169,851	24	.....	.....	.....	.....	24	.....	22
52,174	160,983	60,954	1,314	10,088	27,872	589,734	6,067	1,902,228	1,306,427	103	.....	.....	.....	.....	103	.....	23
259,228	142,817	318,791	.....	22,499	148,237	2,175,343	14,183	4,831,705	2,642,179	66	3	.....	.....	.....	63	.....	24
1,309,137	1,603,829	1,680,676	216,250	342,191	716,319	12,136,036	38,461	25,499,207	13,324,710	632	15	.....	6	.....	611	.....	25
179,050	277,721	213,129	.....	21,160	224,923	1,272,546	6,477	4,119,975	2,840,952	179	45	.....	.....	.....	134	.....	26
3,800	2,105	6,890	.....	1,320	1,646	75,514	232	104,712	28,966	1	.....	.....	.....	.....	1	.....	27
74,659	165,299	121,977	.....	19,986	15,227	826,733	3,843	1,854,332	1,023,756	150	55	.....	28	.....	67	.....	28
.....	.....	1,791	350	625	65	7,125	36	16,308	9,147	.....	.....	.....	.....	.....	.....	.....	29
28,271	33,220	60,581	.....	4,549	73,259	383,469	963	923,843	539,411	52	.....	.....	.....	.....	52	.....	30
21,325	10,163	11,747	.....	3,764	9,026	168,805	229	279,841	110,807	4	.....	.....	.....	.....	4	.....	31
2,595	700	3,525	.....	1,355	360	19,110	61	37,074	17,903	2	.....	.....	.....	.....	2	.....	32
47,471	52,414	35,383	.....	7,331	15,029	274,088	2,019	780,245	504,138	20	.....	.....	.....	.....	20	.....	33
161,763	55,135	122,919	150	11,290	192,586	618,942	4,688	1,852,759	1,229,129	61	12	.....	.....	.....	49	.....	34

[1] All other states embrace: Idaho, 2 establishments; North Dakota, 2; South Dakota, 3.
[2] Same number reported throughout the year.
[3] All other states embrace: Alabama, 3 establishments; District of Columbia, 2; Florida, 2; Kansas, 2; Maine, 4; Montana, 1; Nebraska, 3; New Hampshire, 1; North Dakota, 1; Oregon, 2; Vermont, 1; Virginia, 6.

DRUG GRINDING.

Comparative summary and detailed statement.—Powdered or pulverized drugs are the principal products of establishments under this classification, which includes the grinding of drugs, charcoal, roots, herbs, gums, licorice root, etc.

The statistics in Tables 17 and 18 are confined to the independent drug-grinding establishments, and do not cover drugs ground and used by establishments engaged in the manufacture of druggists' preparations or patent medicines and compounds.

TABLE 17.—COMPARATIVE SUMMARY: 1919, 1914, 1909, 1904, 1899, AND 1889.

	1919	1914	1909	1904	1899	1889	PER CENT OF INCREASE.[1] 1914–1919	1909–1914	1904–1909	1899–1904	1889–1899
Number of establishments	31	29	25	27	26	13	.....	.....	.....	.....	.....
Persons engaged	1,661	1,280	1,152	1,111	775	(2)	29.8	11.1	3.7	43.4	.....
Proprietors and firm members	16	22	16	23	29	(2)	.....	.....	.....	.....	.....
Salaried employees	298	199	214	107	102	(2)	49.7	−7.0	100.0	4.9	.....
Wage earners (average number)	1,347	1,059	922	981	644	148	27.2	14.9	−6.0	52.3	335.1
Primary horsepower	6,725	4,972	3,322	2,866	4,697	845	10.8	49.7	15.9	−39.0	455.9
Capital	$14,991,135	$8,434,036	$5,187,214	$4,991,218	$2,837,911	$337,885	77.7	62.6	3.9	75.9	739.9
Salaries and wages	2,323,779	935,484	732,456	637,780	418,446	103,594	148.0	27.7	14.8	52.4	303.9
Salaries	797,642	352,123	268,328	154,683	126,623	(2)	126.0	31.2	73.5	22.2	.....
Wages	1,526,137	583,361	464,128	483,097	291,823	(2)	162.0	25.7	−3.9	65.5	.....
Paid for contract work	111,651	35	5,000	.....	12,050	(2)	.....	−99.3	.....	.....	.....
Rent and taxes	910,931	91,883	55,339	[3] 43,709	[3] 43,963	(2)	891.0	66.0	.....	−0.6	.....
Cost of materials	11,556,480	5,215,237	3,453,720	3,024,305	3,315,228	192,321	122.0	51.0	14.2	−8.8	1,624.0
Value of products	16,937,698	8,080,118	6,006,999	5,145,522	4,308,144	436,766	110.0	34.5	16.7	19.4	886.0
Value added by manufacture [4]	5,381,218	2,864,831	2,553,279	2,121,217	992,916	244,445	87.8	12.2	20.4	114.0	306.0

[1] A minus sign (−) denotes decrease; percentages are omitted where base is less than 100.
[2] Figures not available.
[3] Exclusive of internal revenue.
[4] Value of products less cost of materials.

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

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male	Under 16. Female	Capital.	EXPENSES. Salaries and wages. Officials.	Salaries and wages. Clerks, etc.
United States	31	1,661	16	97	126	75	1,347	Oc 1,456	Ap 1,220	1,460	1,210	236	4	10	$14,991,135	$515,702	$281,850
Illinois	4	185	1	9	4	5	166	Oc 189	De 137	137	79	49	4	5	883,963	60,831	15,013
New York	9	449	4	29	35	36	345	Au 378	Ja 326	349	202	142	.....	5	1,578,929	103,131	79,141
Pennsylvania	4	79	3	10	8	8	50	No [1] 55	My 46	55	51	4	.....	.....	422,439	13,808	15,450
All other states [2]	14	948	8	49	79	26	786	.....	.....	919	878	41	.....	.....	12,105,804	338,022	172,246

STATE.	EXPENSES—continued. Salaries and wages—Con. Wage earners.	For contract work.	Rent and taxes. Rent of factory.	Rent and taxes. Taxes, Federal, state, county, and local.	For materials. Principal materials.	For materials. Fuel and rent of power.	Value of products.	Value added by manufacture.	POWER. Primary horsepower. Total.	Owned. Steam engines and turbines.	Owned. Internal-combustion engines.	Owned. Water power.[3]	Rented.[4]	Electric horsepower generated in establishments reporting.
United States	$1,526,137	$111,651	$18,450	$892,481	$11,223,377	$333,103	$16,937,698	$5,381,218	6,725	5,445	50	12	1,218	326
Illinois	113,681	.....	840	105,661	595,751	17,182	1,203,678	590,745	815	810	.....	.....	5	.....
New York	273,299	111,651	5,636	127,421	1,788,707	29,409	3,068,793	1,250,677	903	559	.....	.....	344	40
Pennsylvania	61,856	.....	4,480	5,152	486,744	8,076	680,680	185,860	359	80	50	.....	229	.....
All other states [2]	1,077,301	.....	7,494	654,247	8,352,175	278,436	11,984,547	3,353,936	4,648	3,996	.....	12	640	286

[1] Same number reported for one or more other months.
[2] All other states embrace: Maryland, 1 establishment; Massachusetts, 4; Minnesota, 1 New Jersey, 5; North Carolina, 1; Virginia, 1; Wisconsin, 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).

ESSENTIAL OILS.

GENERAL STATISTICS.

General character of the industry.—The industry includes establishments engaged primarily in the manufacture of the natural essential oils, both crude and refined (except turpentine), and of witch-hazel extract.

Essential oils, volatile oils, or essences are distinguished by the possession of strong and characteristic odors and by being vaporizable without decomposition, and usually with little or no residue. The list of essential oils met with in commerce is quite extensive, but the bulk of the production is represented by comparatively few. There is considerable production of synthetic oils and perfumery bases, but these are classed as chemicals and are included in the chemical report.

Comparative summary.—Table 1 presents comparative statistics for the industry for the census years 1879 to 1919, inclusive, with percentages of increase for each census period. Statistics for the industry were first obtained at the census of 1859 when it was represented by 45 establishments with products valued at $124,317. In 1869 there were 118 establishments and products valued at $631,445, but it is probable that the production of essential oils on farms was included in the manufacturing statistics.

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 in 1919.

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 13.

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 industrial conditions existing during the year. The females employed as wage earners constituted 6 per cent of the total number. The industry is to a considerable extent seasonal.

Prevailing hours of labor.—The statistics presented in Table 5 show a material reduction in the average number of hours of labor per week. In 1919, 25.9 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were 60 or over, as compared with 66.7 per cent in 1914 and 74 per cent in 1909.

Size of establishments, by average number of wage earners.—The industry is one of small units, as shown by Table 6. In 1919, 69 establishments, or 88.5 per cent of the total, employed fewer than 6 wage earners each.

Size of establishments, by value of products.—The grouping by value of products in Table 7 reflects the general increase in values. The average value of products per establishment was $25,500 in 1909, $22,000 in 1914, and increased to $73,000 in 1919; but the increase is essentially due to high prices, for on a quantity basis the production for the various products was in general materially less in 1919 than in 1914. The increase in values accounts for the changes from lower to higher groups.

Character of ownership.—Table 8 presents the statistics for establishments classified according to form of ownership. The majority of the establishments are owned by individuals, though the establishments owned by corporations, with 69.5 per cent of the wage earners and 83.3 per cent of the value of products in 1919, represent the bulk of the industry.

Number and horsepower of types of prime movers.—Table 9 presents the power statistics for 1919, 1914, and 1909. Electric power is a growing factor. In 1919 this class comprised electric motor equipment operated with purchased current, specified as rented, and secondary electric, or that generated by the establishment reporting, formed 26.8 per cent of the total primary power as compared with 7.8 per cent in 1914 and 8.5 per cent in 1909.

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

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	78	105	68	52	47	67	124	−25.7	.....	.....	.....	.....	.....
Persons engaged	493	435	408	237	(2)	(2)	(2)	13.3	6.6	72.2	.....	.....	.....
Proprietors and firm members	74	116	73	68	(2)	(2)	(2)	−36.2	.....	.....	.....	.....	.....
Salaried employees	98	70	45	37	39	(2)	(2)	.....	.....	.....	.....	.....	.....
Wage earners (average number)	321	249	290	132	168	197	278	28.9	−14.1	119.7	−21.4	(2)	(2)
Primary horsepower	1,833	2,309	1,218	849	1,048	465	(2)	−20.6	89.6	43.5	−19.0	125.4	.....
Capital	$6,379,910	$1,616,682	$1,365,438	$723,004	$576,286	$102,223	$67,755	294.6	18.4	88.9	25.5	463.8	50.9
Salaries and wages	620,003	238,607	184,495	109,713	86,148	37,492	24,030	159.8	29.3	68.2	27.4	129.8	56.0
Salaries	228,790	105,335	61,505	40,002	24,733	(2)	(2)	117.2	71.3	53.8	61.7	.....	.....
Wages	391,213	133,272	122,990	69,711	61,415	(2)	(2)	193.5	8.4	76.4	13.5	.....	.....
Paid for contract work	2,000	1,500	20	(2)	(2)	(2)	(2)	33.3	.....	.....	.....	.....	.....
Rent and taxes	148,658	14,106	9,295	[4] 5,339	(2)	(2)	(2)	953.9	51.8	.....	.....	.....	.....
Cost of materials	3,903,417	1,564,835	1,255,478	1,110,470	588,594	129,735	125,167	149.4	24.6	13.1	88.7	353.7	3.6
Value of products	5,698,403	2,313,606	1,737,234	1,464,662	813,495	255,847	248,858	146.3	33.2	18.6	80.0	218.0	2.8
Value added by manufacture[5]	1,794,986	748,771	481,756	354,192	224,901	126,112	123,691	139.7	55.4	36.0	57.5	78.3	2.0

[1] A minus sign (−) denotes decrease; percentages are omitted when 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.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	78	321	100.0	....	$5,698	100.0	....	$1,795	100.0	...
New Jersey	4	157	48.9	1	3,088	54.2	1	860	47.9	1
Michigan	29	62	19.3	2	951	16.7	2	282	15.7	2
Connecticut	9	26	8.1	3	473	8.3	3	222	12.4	3
Indiana	22	13	4.1	6	179	3.1	6	154	8.6	4
All other states	14	63	19.6	....	1,007	17.7	....	277	15.4	...

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	493	451	42	91.5	8.5
	1914	435	399	36	91.7	8.3
	1909	408	390	18	95.6	4.4
Proprietors and officials	1919	123	122	1	99.2	0.8
	1914	147	145	2	98.6	1.4
	1909	91	91	.....	100.0	.....
Proprietors and firm members	1919	74	74	.....	100.0	.....
	1914	116	115	1	99.1	0.9
	1909	73	73	.....	100.0	.....
Salaried officers of corporations	1919	15	15	.....	100.0	.....
	1914	18	17	1	94.4	5.6
	1909	8	8	.....	100.0	.....
Superintendents and managers	1919	34	33	1	97.1	2.9
	1914	13	13	.....	100.0	.....
	1909	10	10	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	49	28	21	57.1	42.9
	1914	39	25	14	64.1	35.9
	1909	27	22	5	81.5	18.5
Wage earners (average number)	1919	321	301	20	93.8	6.2
	1914	249	229	20	92.0	8.0
	1909	290	277	13	95.5	4.5
16 years of age and over	1919	318	298	20	93.7	6.3
	1914	249	229	20	92.0	8.0
	1909	290	277	13	95.5	4.5
Under 16 years of age	1919	3	3	.....	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 employed during year.	NUMBER EMPLOYED ON THE 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	321	299	299	295	278	*274*	292	360	**396**	370	340	320	329	69.2
Males	301	284	284	279	263	*254*	272	337	**373**	346	316	297	307	68.1
Females	20	*15*	*15*	16	*15*	20	20	23	23	**24**	24	23	22	62.5
1914	249	202	*199*	215	218	223	288	287	**359**	307	253	231	206	55.4
1909	290	211	215	310	395	380	317	*206*	234	303	338	336	233	52.2
Connecticut	26	**46**	**46**	**46**	21	16	13	*9*	*9*	*9*	31	28	38	19.6
Indiana	13	.....	.....	.....	.....	*1*	6	33	40	**47**	29	.....	.....	2.1
Michigan	62	*47*	*47*	*47*	*47*	*47*	66	97	116	86	48	48	48	40.5
New Jersey	157	141	143	*138*	149	150	151	158	163	161	168	178	**184**	75.0

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

STATE.	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	321	5	2	19	140	51	21	83	.....
1914	249	(2)	(2)	2	26	54	1	132	34
1909	290	(2)	(2)	12	13	41	9	172	43
Connecticut	26	.....	2	.....	.....	4	17	3	.....
Indiana	13	.....	.....	.....	.....	.....	.....	13	.....
Michigan	62	.....	.....	11	.....	2	.....	49	.....
New Jersey	157	1	.....	.....	111	45	.....	.....	.....

[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 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.	
			Establishments.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States 1919	78	321	32	37	54	5	66	3	115	1	86
1914	105	249	6	92	115	4	39	3	95	.....	.....
Connecticut	9	26	.....	8	9	1	17	.....	.....	.....	.....
Indiana	22	13	9	13	13	.....	.....	.....	.....	.....	.....
Michigan	29	62	20	7	11	1	6	1	45	.....	.....
New Jersey	4	157	.....	1	1	.....	.....	2	70	1	86

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	78	105	68	321	249	290	$5,698,403	$2,313,606	$1,737,234	$1,794,986	$748,771	$481,756
Less than $5,000	32	71	44	19	61	64	90,544	146,100	70,594	51,109	86,365	44,573
$5,000 to $20,000	27	20	12	16	62	40	257,369	195,040	120,316	184,275	92,092	62,570
$20,000 to $100,000	9	10	7	17	29	108	319,701	432,808	249,908	139,855	72,089	111,107
$100,000 to $500,000	6	3	5	112	97	78	1,415,124	1,539,658	1,296,416	525,732	498,225	263,497
$500,000 to $1,000,000	[1] 4	1		[1] 157			[1] 3,615,665			[1] 894,015		
	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	41.0	67.6	64.7	5.9	24.5	22.1	1.6	6.3	4.1	2.8	11.5	9.3
$5,000 to $20,000	34.6	19.0	17.6	5.0	24.9	13.8	4.5	8.4	6.9	10.3	12.3	13.0
$20,000 to $100,000	11.5	9.5	10.3	5.3	11.6	37.2	5.6	18.7	14.4	7.8	9.6	23.1
$100,000 to $500,000	7.7	2.9	7.4	34.9	39.0	26.9	24.8	66.5	74.6	29.3	66.5	54.7
$500,000 to $1,000,000	5.2	1.0		48.9			63.5			49.8		

[1] Includes the group "$1,000,000 and over."

TABLE 8.—CHARACTER OF OWNERSHIP: 1919, 1914, AND 1909.

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
All classes	1919	78	321	$5,698,403
	1914	105	249	2,313,606
	1909	68	290	1,737,234
Individual	1919	51	46	777,691
	1914	65	69	202,974
	1909	44	172	490,642
Corporation	1919	17	223	4,744,092
	1914	16	129	1,848,654
	1909	11	95	1,181,309
All other	1919	10	52	176,620
	1914	24	51	261,978
	1909	13	23	65,283

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
Per cent of total:				
Individual	1919	65.4	14.3	13.6
	1914	61.9	27.7	8.8
	1909	64.7	59.3	28.2
Corporation	1919	21.8	69.5	83.3
	1914	15.2	51.8	79.9
	1909	16.2	32.8	68.0
All other	1919	12.8	16.2	3.1
	1914	22.9	20.5	11.3
	1909	19.1	7.9	3.8

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	70	74	57	1,833	2,309	1,218	100.0	100.0	100.0
Owned	52	74	52	1,691	1,959	1,089	92.3	84.8	89.4
Steam engines	37	[1] 47	[1] 41	1,512	[1] 1,608	[1] 979	82.5	69.6	80.4
Internal-combustion engines	13	24	7	129	251	39	7.1	10.9	3.2
Water wheels, turbines, and motors	2	3	4	50	100	71	2.7	4.3	5.8
Rented	18	.....	5	142	350	129	7.7	15.2	10.6
Electric	18	.....	5	142	.....	104	7.7	.....	8.5
Other	.....	.....	.....	.....	350	25	.....	15.2	2.1
Electric	65	16	5	492	181	104	100.0	100.0	100.0
Rented	18	.....	5	142	.....	104	28.9	.....	100.0
Generated by establishments reporting	47	16	.....	350	181	.....	71.1	100.0	.....

[1] Includes turbines.

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

STATE.	COAL		Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
	Anthracite (tons, 2,240 lbs.)	Bituminous (tons, 2,000 lbs.)			
United States.....1919..	8,943	5,384	4,001	184	7,296
1914..	3,959	5,568	159	(1)	343
Connecticut.....	303	500	.....	.....	.....
Indiana.....	12	549	1	.....	.....
Michigan.....	.....	668	.....	21	.....
New Jersey.....	8,450	590	.....	163	1,296
All other states.....	178	3,077	4,000	.....	6,000

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 11 presents comparative statistics for products for 1919, 1914, and 1909. Refined oil of peppermint as reported for 1919 shows an average unit value of $7.97 per pound as compared with $2.28 in 1914 and $1.86 in 1909. In like manner, oil of spearmint, crude, carries an average unit value of $4.86 per pound for 1919, as compared with $2.52 for 1914 and $2.49 for 1909; black birch an average value of $3.44 is shown for 1919, $1.64 for 1914, and $1.52 for 1909; and witch-hazel extract shows an increase from $0.61 per gallon 1909 to $0.63 in 1914 and to $0.92 in 1919.

TABLE 11.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919, 1914, AND 1909.

KIND.	1919	1914	1909
Number of establishments.....	[1] 87	107	74
The classified industry.....	78	105	68
Establishments reporting subsidiary products (other industries).....	9	2	6
Total value of products.....	$5,897,469	$2,565,361	$1,773,304
The classified industry, all products.....	5,698,403	2,313,606	1,773,304
Subsidiary products of other industries.....	199,066	251,755	
Oil of peppermint:			
Crude (for sale as such)—			
Number of establishments.....	51	.....	.....
Pounds.....	138,042	254,793	269,081
Value.....	$493,157	$353,076	$450,981
Refined—			
Number of establishments.....	3	.....	.....
Pounds.....	98,191	109,198	36,700
Value.....	$782,979	$248,541	$68,098
Oil of spearmint (crude):			
Number of establishments.....	8	.....	.....
Pounds.....	29,990	94,209	33,400
Value.....	$145,749	$238,074	$83,283
Oil of black birch:			
Number of establishments.....	9	.....	.....
Pounds.....	21,568	41,178	67,053
Value.....	$74,290	$67,691	$102,045
Oil of sassafras:			
Number of establishments.....	6	.....	.....
Pounds.....	194,317	.....	.....
Value.....	$158,414	(2)	(2)
Oil of cedar:			
Pounds.....	9,629	.....	.....
Value.....	$29,148	(2)	(2)
Oil of cloves:			
Pounds.....	220,977	.....	.....
Value.....	$680,218	(2)	(2)
Oil of lemon:			
Pounds.....	33,608	.....	.....
Value.....	$61,687	(2)	(2)
Oil of nutmeg:			
Pounds.....	48,114	.....	.....
Value.....	$68,472	(2)	(2)
Oil of sandalwood:			
Pounds.....	21,326	.....	.....
Value.....	$207,759	(2)	(2)
Other essential oils [3].....	$1,698,861	$382,100	$407,398
Witch-hazel extract:			
Gallons.....	675,345	917,690	691,823
Value.....	$620,075	$575,938	$419,793
All other products, value.....	$876,660	$699,941	$241,706

[1] Distributed by states (87)—Michigan, 20; Indiana, 22; Connecticut, 10; Tennessee, 6; New York, 5; New Jersey, 4; California, 3; Pennsylvania, 3; Virginia, 2; Kentucky, 1; New Hampshire, 1; and Ohio, 1.
[2] Included with "Other essential oils."
[3] Includes, 1919, oil of apricot, bay, belladonna, bitter almond, camphor, copaiba, celery, coriander, cubeb, erigeron, henbane, mare's tail, mustard, orange, orris root, parsley, patchouly, peach, pimento, tansy, vetiver, wintergreen, wormwood, etc.

GENERAL TABLES.

Table 12 gives the comparative statistics for the number of establishments, average number of wage earners, primary horsepower, cost of materials, and value of products, for the census years 1919, 1914, and 1909.

Table 13 is a detailed statement, by states, for 1919.

TABLE 12.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	78	321	1,833	$391	$3,903	$5,698
	1914	105	249	2,309	133	1,565	2,314
	1909	68	290	1,218	123	1,255	1,737
Indiana	1919	22	13	39	15	25	179
	1914	29	61	43	30	18	102
	1909	8	15	60	5	2	21
Michigan	1919	29	62	715	$57	$669	$951
	1914	53	38	619	17	226	492
	1909	23	54	365	17	415	486
All other states	1919	27	246	1,079	319	3,209	4,568
	1914	23	150	1,647	86	1,321	1,720
	1909	37	221	793	101	838	1,230

TABLE 13.—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.	16 and over.		Under 16, male.		Salaries and wages.	
					Male.	Female.	Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.		Male.	Female.			Officials.	Clerks, etc.
United States	78	493	74	49	28	21	321	Au 396	My 274	469	441	25	3	$6,379,910	$151,144	$77,646
Connecticut	9	48	10	4	3	5	26	Ja [1] 46	Jy [1] 9	51	49	2	.....	544,305	12,600	14,423
Indiana	22	41	27	1	.....	.....	13	Se 47	De [2] 0	49	49	.....	.....	57,095	1,000	.....
Michigan	29	115	31	12	7	3	62	Au 116	Ja [1] 47	117	114	3	.....	974,755	55,451	13,683
New Jersey	4	192	.....	13	15	7	157	De 184	Mh 138	184	161	20	3	4,466,823	43,684	38,631
All other states [3]	14	97	6	19	3	6	63	.....	.....	68	68	.....	.....	336,932	38,409	10,909

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.
	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Owned. Steam engines (not turbines).	Owned. Internal-combustion engines.	Owned. Water power. [4]	Rented, electric.	
United States	$391,213	$2,000	$25,885	$122,773	$3,808,067	$95,350	$5,698,403	$1,794,986	1,833	1,512	129	50	142	350
Connecticut	19,791	.....	25	1,572	244,383	6,035	472,315	221,807	345	185	60	50	50	.....
Indiana	15,535	.....	252	5,431	20,623	4,729	179,288	153,936	39	10	4	.....	25	.....
Michigan	56,849	2,000	79	11,857	659,599	9,291	951,250	282,360	715	690	25	.....	.....	5
New Jersey	214,214	.....	16,000	87,361	2,183,691	44,439	3,088,225	860,095	411	406	.....	.....	5	340
All other states [3]	84,824	.....	9,629	16,552	699,771	30,856	1,007,325	276,698	323	221	40	.....	62	5

[1] Same number reported for one or more other months.
[2] None reported for one or more other months.
[3] All other states embrace: California, 1 establishment; Kentucky, 1; New York, 5; Ohio, 1; Pennsylvania, 3; Tennessee, 1; Virginia, 2.
[4] Includes water wheels and turbines (irrespective of ownership of water supply).

EXPLOSIVES.

GENERAL STATISTICS.

General character of the industry.—This report covers the commercial manufacture of the various explosives. Establishments engaged primarily in the manufacture of cartridges, detonators, fuses, etc., are included under "Ammunition," and those making colored fires, rockets, and similar products under "Fireworks." The general statistics do not include establishments operated by the Federal Government, but the statistics for the Federal establishments will be found in Table 11.

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

Principal states, ranked by value of products.—Table 2 gives certain general statistics, namely, number of establishments, average number of wage earners, value of products, and value added by manufacture for states, ranked according to value of products. In this and other tables New Jersey ranking first, Missouri third, and several other important states can not be shown separately, and are therefore included in the group "All other states."

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." Figures for states will be found in Table 13.

Wage earners, by months, for states.—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 2.1 per cent of the average number employed in 1919.

Prevailing hours of labor.—The figures in Table 5, show a very material decrease in the average hours of labor per week for the industry. In 1919, 87.6 per cent were employed in establishments where the prevailing hours of labor per week were 48 or less, whereas in 1914 but 10.1 per cent were in establishments of this character, and in 1909, 3.4 per cent. On the other hand, in 1909, 87.3 per cent of all wage earners were in establishments where the hours of labor were 60 or more per week, this percentage decreasing to 27.1 per cent in 1914 and to 6.7 per cent in 1919.

Size of establishments, by average number of wage earners.—Comparative figures are not available for the prior census years. Table 6 shows the group employing "1 to 5 wage earners, inclusive," is the largest in number of establishments.

Size of establishments, by value of products.—The average value of products per establishment as shown in Table 7, increased from $373,000 in 1914 to $784,000 in 1919, though this increase is largely due to enhanced values, and this factor accounts in the main for the changes from lower to higher groups.

Character of ownership.—The establishments are essentially under corporate ownership. In 1919 only two were owned by individuals and three by firms. The corporations reported 99.8 per cent of the wage earners and 99.9 per cent of the products. The conditions at prior censuses were substantially the same.

Number and horsepower of types of prime movers.—Table 8 presents the statistics concerning power. Of the total primary power, 76.1 per cent were utilized in the form of electric power in 1919, either purchased or generated, as compared with 55.8 per cent in 1914 and 51.9 per cent in 1909.

Fuel consumed.—Table 9 shows the principal kinds of fuel used for the industry in 1919 and 1914, and gives separately the amount consumed in states requiring considerable quantities of fuel for manufacturing explosives.

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	[2] 118	[2] 111	[2] 86	124	97	69	54	0.6	.....	−30.6	.....	.....	.....
Persons engaged	15,429	8,425	7,058	7,113	5,293	(3)	(3)	83.1	19.4	−0.8	34.4	.....	.....
Proprietors and firm members	28	20	21	24	23	(3)	(3)	40.0	−4.8	−12.5	4.3	.....	.....
Salaried employees	6,152	2,099	763	1,289	768	(3)	(3)	193.1	175.1	−40.8	67.8	.....	.....
Wage earners (av. number)	9,249	6,306	6,274	5,800	4,502	2,353	1,340	46.7	0.5	8.2	28.8	(4)	(4)
Primary horsepower	51,635	45,778	28,601	29,665	19,195	10,674	(3)	12.8	60.1	−3.6	54.5	79.8	.....
Capital	$133,247,684	$71,351,414	$50,167,976	$42,307,163	$19,465,846	$13,539,478	$6,585,185	86.7	42.2	18.6	117.3	43.8	105.6
Salaries and wages	25,749,210	7,795,623	5,437,976	5,105,824	3,298,203	1,549,510	675,414	230.3	43.4	6.5	54.8	112.9	129.4
Salaries	13,244,224	3,307,335	1,133,606	1,797,050	914,447	(3)	(3)	300.5	191.8	−36.9	96.5	.....	.....
Wages	12,504,986	4,488,288	4,304,370	3,308,774	2,383,756	(3)	(3)	178.6	4.3	30.1	38.8	.....	.....
Paid for contract work	30,542	7,645	3,065	2,450	7,058	(3)	(3)	299.5	149.4	25.1	−68.0	.....	.....
Rent and taxes (including internal revenue	2,737,975	322,132	146,662	[5] 81,075	[5] 70,511	(3)	(3)	750.0	119.6	.....	.....	.....	.....
Cost of materials	45,911,049	25,626,539	22,811,548	17,203,667	10,334,974	5,481,723	3,271,549	79.2	12.3	32.6	66.5	88.5	67.6
Value of products	92,474,813	41,432,970	40,139,661	29,602,884	17,125,418	11,352,615	5,802,029	123.2	3.2	35.6	72.9	50.8	95.7
Value added by manufacture[6]	46,563,764	15,806,431	17,328,113	12,399,217	6,790,444	5,870,892	2,530,480	194.6	−8.8	39.8	82.6	15.7	132.0

[1] A minus sign (−) denotes decrease. Percentages are omitted where base is less than 100.
[2] Represents 122 plants in 1919, 116 in 1914, and 124 in 1909.
[3] Figures not available.
[4] Figures not strictly comparable.
[5] Exclusive of internal revenue.
[6] Value of products, less cost of materials.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands.)	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	118	9,249	100.0	...	$92,475	100.0	...	$46,564	100.0	...
Pennsylvania	26	1,217	13.2	2	11,446	12.4	2	5,344	11.5	2
California	3	611	6.6	3	6,408	6.9	4	3,555	7.6	4
Illinois	9	454	4.9	5	$3,780	4.1	6	$1,514	3.3	6
Ohio	12	304	3.3	6	2,790	3.0	8	1,317	2.8	8
All other states	68	6,663	72.0	...	68,051	73.6	...	34,834	74.8	..

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	15,429	13,483	1,946	87.4	12.6
	1914	8,425	7,948	477	94.3	5.7
	1909	7,058	6,787	271	96.2	3.8
Proprietors and officials	1919	1,549	1,521	28	98.2	1.8
	1914	350	342	8	97.7	2.3
	1909	242	232	10	95.9	4.1
Proprietors and firm members	1919	28	14	14	50.0	50.0
	1914	20	15	5	75.0	25.0
	1909	21	13	8	61.9	38.1
Salaried officers of corporations	1919	131	126	5	96.2	3.8
	1914	92	90	2	97.8	2.2
	1909	66	64	2	97.0	3.0
Superintendents and managers	1919	1,390	1,381	9	99.4	0.6
	1914	238	237	1	99.6	0.4
	1909	155	155	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	4,631	2,903	1,728	62.7	37.3
	1914	1,769	1,379	390	78.0	22.0
	1909	542	488	54	90.0	10.0
Wage earners (average number)	1919	9,249	9,059	190	97.9	2.1
	1914	6,306	6,227	79	98.7	1.3
	1909	6,274	6,067	207	96.7	3.3
16 years of age and over	1919	9,249	9,059	190	97.9	2.1
	1914	6,298	6,219	79	98.7	1.3
	1909	6,267	6,060	207	96.7	3.3
Under 16 years of age	1919	.....	.....	.....	.....	.....
	1914	8	8	.....	100.0	.....
	1909	7	7	.....	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 employed during year.	NUMBER EMPLOYED ON 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	9,249	11,809	9,903	9,509	8,922	8,721	*8,605*	8,706	8,937	8,994	8,946	8,984	8,952	72.9
Males	9,059	11,362	9,654	9,239	8,776	8,578	*8,469*	8,585	8,820	8,854	8,788	8,804	8,779	74.5
Females	190	447	249	270	146	143	136	121	*117*	140	158	180	173	26.2
1914	6,306	6,393	6,168	6,218	6,154	5,917	5,910	*5,877*	5,947	5,990	6,129	7,014	7,950	73.9
1909	6,274	5,813	5,737	5,771	*5,604*	5,893	6,138	6,407	6,548	6,680	6,799	6,899	7,106	77.5
California	611	1,011	779	692	574	575	509	558	567	518	531	521	*497*	49.2
Illinois	454	491	469	474	476	429	446	433	463	472	439	444	*412*	83.9
Ohio	304	355	297	279	278	259	*251*	284	316	334	354	323	318	70.7
Pennsylvania	1,217	1,490	1,192	1,114	*1,094*	1,117	1,101	1,126	1,219	1,275	1,269	1,317	1,290	73.4

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

STATE.	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..	9,249	62	.....	8,048	192	216	107	624	.....
1914..	6,306	(2)	(2)	635	1,399	1,288	1,272	1,624	88
1909..	6,274	(2)	(2)	216	.....	373	205	5,344	136
California	611	.....	.....	611	.....	.....	.....	.....	.....
Illinois	454	4	.....	270	.....	.....	.....	180	.....
Ohio	304	41	.....	98	.....	101	10	54	.....
Pennsylvania	1,217	2	.....	614	192	62	77	270	.....

[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—																
			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 (average number).	Establishments.	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	118	9,249	1	38	90	15	201	25	910	15	1,047	17	2,720	4	1,393	2	1,582	1	1,297
California	3	611	.....	.....	.....	.....	.....	.....	.....	1	55	1	134	1	422	.....	.....	.....	.....
Illinois	9	454	.....	3	6	.....	.....	4	182	1	86	1	180	.....	.....	.....	.....	.....	.....
Ohio	12	304	1	4	12	2	21	2	58	2	112	1	101	.....	.....	.....	.....	.....	.....
Pennsylvania	26	1,217	.....	10	28	3	40	7	293	3	221	2	341	1	294	.....	.....	.....	.....

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

VALUE OF PRODUCT.	NUMBER OF ESTABLISHMENTS.		AVERAGE NUMBER OF WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.	
	1919	1914	1919	1914	1919	1914	1919	1914
All classes	118	111	9,249	6,306	$92,474,813	$41,432,970	$46,563,764	$15,806,431
Less than $5,000	1	6	.....	8	.....	12,626	.....	2,184
$5,000 to $20,000	10	11	[1] 19	18	[1] 155,231	136,049	[1] 52,613	33,518
$20,000 to $100,000	27	26	163	255	1,411,163	1,587,499	716,301	571,918
$100,000 to $500,000	44	49	1,266	2,850	11,607,887	11,841,188	5,117,216	5,855,290
$500,000 to $1,000,000	14	7	1,229		8,971,989	5,548,931	3,748,800	
$1,000,000 and over	22	12	6,572	3,175	70,328,543	22,306,677	36,928,834	9,343,521
	PER CENT DISTRIBUTION.							
All classes	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than $5,000	0.8	5.4	.....	0.1	.....	(2)	.....	(2)
$5,000 to $20,000	8.5	9.9	0.2	0.3	0.2	0.3	0.1	0.2
$20,000 to $100,000	22.9	23.4	1.8	4.0	1.5	3.8	1.5	3.6
$100,000 to $500,000	37.3	44.2	13.7	45.2	12.6	28.6	11.0	37.0
$500,000 to $1,000,000	11.9	6.3	13.3		9.7	13.4	8.1	
$1,000,000 and over	18.6	10.8	71.0	50.3	76.0	53.8	79.3	59.1

[1] Includes the group "Less than $5,000."

[2] Less than one-tenth of 1 per cent.

TABLE 8.—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	1,431	872	433	51,635	45,778	28,601	100.0	100.0	100.0
Owned	373	435	426	35,149	37,884	28,468	68.1	82.8	99.5
Steam [1]	324	396	346	33,676	36,304	25,558	65.2	79.3	89.4
Engines	293	396	346	23,304	36,304	25,558	45.1	.....	.....
Turbines	31			10,372			20.1		
Internal-combustion engines	5	10	17	40	62	221	0.1	0.1	0.8
Water wheels, turbines, and motors	44	29	63	1,433	1,518	2,689	2.8	3.3	9.4
Rented, electric	1,058	437	7	16,486	7,894	133	31.9	17.2	0.5
Electric	2,679	1,567	885	39,305	25,560	14,836	100.0	100.0	100.0
Rented	1,058	437	7	16,486	7,894	133	41.9	30.9	0.9
Generated by establishments reporting	1,621	1,130	878	22,819	17,666	14,703	58.1	69.1	99.1

[1] Figures for horsepower include for 1909 the amount reported under the head of "Other" owned power.

TABLE 9.—FUEL CONSUMED, BY STATES: 1919.

STATE.	COAL. Anthracite (tons, 2,240 lbs.).[1]	COAL. Bituminous (tons, 2,000 lbs.).	Coke (tons, 2,000 lbs.).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
United States...1919..	40,489	440,931	4,190	181,253	173	65,357
1914..	68,746	269,563	510	103,679	(2)	22,100
California	.....	.....	.....	92,515	.....	.....
Illinois	.....	24,551	.....	.....	.....	.....
Ohio	10	14,601	.....	8	50	.....
Pennsylvania	29,477	35,800	85	.....	113	1,295
All other states	11,002	365,979	4,105	88,730	10	64,062

[1] Includes some semianthracite.

[2] Included in figures for fuel oils.

SPECIAL STATISTICS.

Detailed statistics of materials and products.—Table 10 gives the statistics for materials purchased and used in the manufacture of explosives, acids produced and consumed in the same establishment, and products by kind, quantity, and value for the census years 1919, 1914, 1909, and 1904. The table includes information in regard to average unit values and the number and distribution of the establishments reporting the several classes of explosives.

TABLE 10.—DETAILED STATISTICS OF QUANTITY, COST, AND VALUE: 1919, 1914, 1909, AND 1904.

[Ton, 2,000 pounds.]

	1919	1914	1909	1904
Number of establishments	118	111	86	124
Number of plants represented	122	116	124	124
MATERIALS.				
Total cost	$45,911,049	$25,626,539	$22,811,548	$17,203,667
Sulphur or brimstone:				
Tons	25,797	15,832	17,389	19,574
Cost	$659,219	$372,763	$367,866	$507,469
Pyrites:				
Tons	6,812	25,885	36,544	12,256
Cost	$46,147	$139,496	$183,509	$67,261
Nitrate of soda:				
Tons	174,742	190,960	188,889	133,034
Cost	$13,154,333	$8,979,877	$7,892,336	$5,608,557
Glycerin:				
Tons	11,535	14,501	(1)	(1)
Cost	$5,755,319	$5,439,405	(1)	(1)
Sulphuric acid:				
Consumption, tons	[2] 105,256	83,605	65,056	49,292
Purchased—				
Tons	62,069	52,398	22,501	18,298
Cost	$976,295	$723,795	$406,204	$247,301
Produced in works where consumed, tons	43,187	31,207	42,555	30,994
Recovered and used, tons	41,583	.....	.....	.....
Nitric acid:				
Consumption, tons	47,112	51,460	35,280	20,338
Purchased—				
Tons	1,537	4,347	3,796	1,350
Cost	$200,267	$476,404	$541,314	$122,047
Produced in works where consumed, tons	45,575	47,113	31,484	18,988
Mixed acid:				
Consumption, tons	77,982	88,653	.....	.....
Purchased—				
Tons	16,637	19,255	25,882	52,776
Cost	$1,567,691	$1,047,377	$1,512,626	$3,093,429
Produced in works where consumed, tons	61,345	69,398	.....	.....
All other materials, cost	$23,551,778	$8,447,422	$11,907,693	$7,557,603
Produced in works where consumed.				
Nitrate of ammonia, pounds	43,254,887	29,891,837	10,904,319	2,863,857
PRODUCTS.				
Total value	[3] $92,474,813	$41,432,970	$40,139,661	$29,602,884
Explosives, total:				
Pounds	498,516,879	481,752,040	487,481,152	360,980,734
Value	$85,668,226	$39,645,382	$37,983,868	$27,695,963
PRODUCTS—continued.				
Explosives—Continued.				
Dynamite—				
Number of establishments[4]	27	26	26	(1)
Pounds	212,529,733	223,667,630	220,145,791	130,920,829
Value	$37,230,704	$20,553,653	$20,998,820	$12,900,193
Unit value, pound	$0.175	$0.092	$0.095	$0.10
Permissible explosives—				
Number of establishments[4]	15	20	13	(1)
Pounds	30,622,923	18,113,601	9,607,448	(1)
Value	$5,499,177	$1,604,072	$863,209	(1)
Unit value, pound	$0.18	$0.09	$0.09	.....
Nitroglycerin—				
Number of establishments[4]	70	58	49	(1)
For sale as such	11	32	23	(1)
For consumption	[5] 67	27	26	(1)
Production, pounds	56,361,210	65,302,883	74,212,980	52,013,704
Sold as such—				
Pounds	714,684	3,785,474	3,923,313	7,935,936
Value	$301,863	$950,611	$863,360	$1,620,117
Unit value, pound	$0.42	$0.25	$0.22	$0.20
Consumed in shooting wells, pounds	7,621,915	(6)	(6)	(6)
Received for contract work, shooting wells	$3,434,835	(1)	(1)	(1)
Consumed in works where produced, lbs	48,024,611	61,517,409	70,289,667	44,077,828
Blasting powder—				
Number of establishments[4]	44	48	38	(1)
Kegs (25 pounds)	7,406,991	8,296,947	9,339,087	8,217,448
Value	$12,168,473	$8,459,113	$9,608,265	$7,377,977
Unit value, keg	$1.64	$1.02	$1.03	$0.90
Gunpowder, black—				
Number of establishments[4]	7	8	8	(1)
Pounds	11,730,094	7,685,036	12,862,700	10,383,944
Value	$2,096,579	$977,455	$1,736,427	$1,541,483
Unit value, pound	$0.18	$0.13	$0.135	$0.15
Other explosives, named in order of value, with number of establishments (1919)—smokeless powder (7), guncotton (2), nitrogelatin (3), nitrostarch (3), fuse powder (4), trinitrotoluol (3), ammonium nitrate (3), and fulminating mercury (1)—				
Pounds	57,744,670	21,076,624	7,464,725	6,303,825
Value	$24,936,595	$7,100,478	$3,913,787	$4,256,193
All other products, value	$6,806,587	$1,787,588	$2,155,793	$1,906,921

[1] Figures not available.

[2] Strength 66°; varying strength in prior years.

[3] In addition, explosives (guncotton and fulminating mercury) to the value of $129,514 were produced by establishments not engaged primarily in the manufacture of explosives.

[4] Distribution by states, 1919:

Dynamite, 27: Pennsylvania, 7; Missouri, 4; New Jersey, 3; California, 2; Illinois, 2, Michigan, 2; Washington, 2; and 1 each in Alabama, Colorado, Montana, Utah, and Wisconsin.

Permissible explosives, 15: Missouri, 3; Pennsylvania, 3; California, 2; New Jersey, 2; and 1 each in Colorado, Illinois, Montana, Utah, and Washington.

Nitroglycerin, 70: Pennsylvania, 13; Oklahoma, 8; Ohio, 7; West Virginia, 6; Illinois, 5; Kentucky, 4; Missouri, 4; New Jersey, 4; Texas, 4; 2 each in California, Kansas, Michigan, and Washington; and 1 each in Alabama, Colorado, Montana, New York, Utah, Wisconsin, and Wyoming.

Blasting powder, 44: Pennsylvania, 12; Illinois, 4; Ohio, 4; 2 each in Alabama, Indiana, Kansas, New Jersey, Tennessee, and West Virginia; and 1 each in Arkansas, California, Colorado, Delaware, Iowa, Minnesota, Missouri, New York, Oklahoma, Utah, Washington, and Wisconsin.

Gunpowder, black, 7: Ohio, 2; and 1 each in Delaware, Illinois, Massachusetts, New Jersey, and New York.

[5] Number manufacturing nitroglycerin for consumption, 67; for consumption in the manufacture of dynamite, 27; for shooting wells, 40 (Kansas, 2; Kentucky, 4; New York, 1; Ohio, 6; Oklahoma, 7; Texas, 4; Illinois, 3; Pennsylvania, 6; West Virginia, 6; and Wyoming, 1).

[6] Included above with "Sold as such."

The figures show an increase of 15 per cent in the total quantity of explosives for 1919 as compared with 1914, the output in 1914 being slightly less in quantity than that reported in 1909. Including the production of Federal establishments, figures for which are given in Table 11, the total production in 1919 was 558,847,332 pounds. The aggregate production of dynamite and permissible explosives was 243,152,656 pounds, valued at $42,729,881, as compared with 241,781,231 pounds, valued at $22,157,725, in 1914. The so-called permissible explosives are those which are approved by the United States Bureau of Mines as suitable for use in mines where dust or gas explosions are likely to occur. They were first reported at the census of 1909.

The principal states in the manufacture of dynamite were New Jersey, Missouri, Pennsylvania, California, Wisconsin, Washington, and Michigan, in the order named, these states producing 87.3 per cent of the total production, the first three named states producing more than one-half of the total. The leading states reporting permissible explosives were New Jersey, Pennsylvania, and Missouri, in the order named, these states producing a little more than four-fifths of the total.

Nitroglycerin.—The bulk of the nitroglycerin manufactured is consumed by the producing establishments in the manufacture of dynamite and similar explosives; 85.2 per cent of the total production was so used in 1919; 93.4 in 1914; 94.7 in 1909; and 84.7 in 1904. The table shows a consumption of nitroglycerin in well shooting, the companies engaged in shooting wells, 40 in number, manufacturing the nitroglycerin. Over 95 per cent of the nitroglycerin sold as such was reported by establishments located in Oklahoma, Kentucky, Missouri, and Pennsylvania, in the order named.

The leading states reporting blasting powder in 1919 were Pennsylvania, Ohio, Iowa, Illinois, Indiana, and Kansas, in the order named, these states producing 75.3 per cent of the total production. Practically all of the black gunpowder was reported by Ohio, New York, Delaware, and Massachusetts, in the order named, these states reporting 92 per cent of the total. Manufactured guncotton was confined to two establishments.

The total production of smokeless powder by all establishments in 1919, including those operated by the Federal Government, was 47,683,193 pounds, as compared with 12,684,072 pounds in 1914 and 6,315,067 pounds in 1909.

Federal establishments.—Table 11 presents the statistics bearing upon the principal materials and products for the Federal establishments in 1919 with production figures for prior censuses.

TABLE 11.—FEDERAL ESTABLISHMENTS.

	Quantity.	Cost.
PRINCIPAL MATERIALS—1919.		
Sulphur.....tons..	2,582	$70,130
Nitrate of soda.....tons..	4,400	286,998
Cotton.....pounds..	2,412,000	195,162
Diphenylamin.....pounds..	18,490	11,093
Nitrocellulose.....pounds..	25,045	7,648
Phenol.....pounds..	138,500	61,724
Grain alcohol.....gallons..	484,953	374,389
MADE AND CONSUMED.		
Sulphuric acid, 100°.....tons..	6,440	.....
Nitric acid, 100°.....tons..	2,600	.....
Ether.....pounds..	1,988,380	.....
Cellulose nitrate.....pounds..	3,536,500	.....
PRODUCTS.		
Explosives:		*Value.*
1919.....pounds..	4,683,927	$2,223,614
1914.....pounds..	5,072,387	1,632,335
1909.....pounds..	1,471,042	656,969
1904.....pounds..	1,105,082	567,804
Smokeless powder—		
1919.....pounds..	4,486,777	2,082,470
1914.....pounds..	4,998,537	.....
Other—		
1919 ammonium picrate.....pounds..	197,150	141,144
1914.....pounds..	73,850	.....

GENERAL TABLES.

Table 12 gives statistics for 1919, 1914, and 1909, by states, for the principal items; number of establishments, average number of wage earners, primary horsepower, cost of materials, and value of products.

Table 13 presents, for 1919, statistics in detail for the industry as a whole, and for each state that can be shown without disclosing the operations of individual establishments.

TABLE 12.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States.....	1919	118	9,249	51,635	$12,505	$45,911	$92,475
	1914	111	6,306	45,778	4,488	25,627	41,433
	1909	86	6,274	28,601	4,304	22,812	40,140
Illinois.....	1919	9	454	1,716	393	2,265	3,780
	1914	9	366	2,083	194	1,655	2,582
	1909	8	290	1,828	190	935	1,469
Ohio.....	1919	12	304	4,086	417	1,474	2,790
	1914	11	311	5,646	188	972	1,439
	1909	11	358	2,692	204	1,104	1,719
Pennsylvania.....	1919	26	1,217	6,897	$1,584	$6,103	$11,447
	1914	33	1,037	5,831	716	4,107	6,003
	1909	27	1,033	4,594	629	4,088	6,388
All other states.....	1919	71	7,274	38,936	10,111	36,069	74,458
	1914	58	4,592	32,218	3,390	18,893	31,409
	1909	40	4,593	19,487	3,281	16,685	30,564

TABLE 13.—DETAILED STATEMENT, BY STATES: 1919.

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Capital.	EXPENSES. Salaries and wages. Officials.	EXPENSES. Salaries and wages. Clerks, etc.
United States	[1] 118	15,429	28	1,521	2,903	1,728	9,249	Ja 11,809	Je 8,605	9,020	8,845	175	$133,247,684	$6,286,185	$6,958,030
California	3	972	.....	79	207	75	611	Ja 1,011	De 497	497	485	12	12,612,729	367,032	567,466
Illinois	9	627	.....	39	99	35	454	Ja 491	De 412	446	426	20	4,294,438	149,360	168,665
Kansas	4	115	.....	30	14	5	66	Mh 86	Oc 41	54	54	.....	1,402,974	81,599	37,420
Ohio	12	427	1	45	58	19	304	Ja 355	Je 251	317	316	1	4,349,334	191,002	116,191
Oklahoma	9	129	.....	37	13	3	76	Se 90	Fe 67	74	74	.....	1,292,118	83,056	18,373
Pennsylvania	26	1,755	27	113	331	67	1,217	Ja 1,490	Ap 1,094	1,290	1,188	102	15,037,033	486,387	764,366
All other states [2]	55	11,404	.....	1,178	2,181	1,524	6,521	.....	.....	6,342	6,302	40	94,259,058	4,927,749	5,285,558

STATE.	EXPENSES—continued. Salaries and wages—Continued. Wage earners.	For contract work.	Rent and taxes. Rent of factory.	Rent and taxes. Taxes, Federal, state, county, and local.	For materials. Principal materials.	For materials. Fuel and rent of power.	Value of products.	Value added by manufacture.	POWER. Primary horsepower. Total.	Owned. Steam engines (not turbines).	Owned. Steam turbines.	Owned. Internal-combustion engines.	Owned. Water power.[3]	Rented (electric).	Electric horsepower generated in establishments reporting.
United States	$12,504,086	$30,542	$15,714	$2,722,261	$43,194,669	$2,716,380	$92,474,813	$46,563,764	51,635	23,304	10,372	40	1,433	16,486	22,819
California	947,109	.....	.....	327,872	2,670,924	181,457	6,407,547	3,555,166	7,209	875	1,400	.....	125	4,809	669
Illinois	393,133	2,451	435	37,036	2,181,021	84,315	3,779,743	1,514,407	1,716	1,595	.....	6	.....	115	1,720
Kansas	88,533	.....	.....	45,332	490,363	15,771	955,150	449,016	616	616	.....	.....	.....	.....	995
Ohio	417,024	.....	2,905	170,728	1,387,511	86,151	2,790,301	1,316,639	4,086	2,077	500	.....	.....	1,509	1,676
Oklahoma	149,013	.....	5,454	41,616	537,048	11,477	1,063,310	514,785	439	439	.....	.....	.....	.....	405
Pennsylvania	1,583,890	.....	2,370	352,640	5,821,596	281,385	11,446,493	5,343,512	6,897	3,957	38	14	405	2,483	1,179
All other states [2]	8,926,284	28,091	4,550	1,747,037	30,106,206	2,055,824	66,032,269	33,870,239	30,672	13,745	8,434	20	903	7,570	16,265

[1] Represents 122 plants.
[2] All other states embrace: Alabama, 2 establishments; Arkansas, 1; Colorado, 2; Delaware, 1; Indiana, 2; Iowa, 1; Kentucky, 4; Massachusetts, 1 (4 plants); Michigan, 2; Minnesota, 1; Missouri, 5; Montana, 1; New Jersey, 10; New York, 2; Tennessee, 2; Texas, 4; Utah, 1; Washington, 2; West Virginia, 8 (9 plants); Wisconsin, 2; and Wyoming, 1.
[3] Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).

FERTILIZERS.

GENERAL STATISTICS.

General character of the industry.—This report covers the manufacture of commercial fertilizers. It does not include fertilizer materials used without special manufacture, such as phosphate rock, farm manures, etc. neither does it include crude cottonseed, the products of cottonseed-oil mills, nor tankage from slaughtering and meat-packing establishments, when used direct. Large quantities of these products, however, are used as material by the fertilizer factories, and as such are included in this report.

Comparative summary.—Table 1 summarizes the statistics for the censuses from 1879 to 1919, inclusive, with percentages of increase.

Principal states, ranked by value of products.—Table 2 presents the more important statistics for the industry, by states, ranked according to value of products. Some of these states, namely, Massachusetts, Michigan, Kansas, Arkansas, Missouri, and Washington, included with "All other states," ranked higher than some states shown in the table.

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 15.

Wage earners, by months.—Statistics shown in Table 4 are designed to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Figures are given separately for all states reporting over 800 wage earners. Comparatively few females are employed as wage earners, only 1.6 per cent of the average number.

Prevailing hours of labor.—The figures presented in Table 5 emphasize the tendency toward the shortening of the hours of labor. Of the total number of wage earners employed, only three-tenths of 1 per cent were in establishments where the prevailing hours per week were 48 or less in 1909, and 1.2 per cent in 1914, while in 1919 this proportion was 9.1 per cent. On the other hand in 1909, 93.4 per cent were in the 60 hours per week and over groups, and in 1914, 71.5 per cent; whereas in 1919 these groups carried but 34.7 per cent.

Size of establishments, by average number of wage earners.—The figures in Table 6 show a drift toward larger establishments. Although there were fewer establishments than in 1914, the figures showing a decrease of 23.5 per cent in number, yet the wage earners in 1919 exceeded those in 1914 by 15.3 per cent. In 1914, 4.1 per cent of the wage earners were in establishments employing fewer than 6 wage earners, and 11.7 per cent were in establishments employing over 250 wage earners; whereas in 1919 but 2.2 per cent of all wage earners were employed in the lower groups, and 19.3 per cent in the groups of over 250 wage earners.

Size of establishments, by value of products.—Table 7 shows that this classification was materially influenced by the advance in values for 1919 as compared with the pre-war censuses. The average value of products per establishment for all classes for 1919 was approximately $468,000, as compared with $195,000 in 1914, and $189,000 in 1909.

Character of ownership.—Table 8 presents statistics based upon the character of ownership, or legal organization, of establishments in the industry for 1919, 1914, and 1909, and for the principal states. Of the 600 establishments, 482, or 80.3 per cent, were owned by corporations in 1919, and these employed 96.2 per cent of the wage earners and reported 96.1 per cent of the products.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power. Electric power is a growing factor; purchased electric power constituted 63.4 per cent of the total primary power in 1919, as compared with 41.5 per cent in 1914 and 19.4 per cent in 1909.

Fuel consumed.—Table 10 presents the statistics for fuel consumed, by kinds and by states, for 1919 and 1914.

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	600	784	550	399	422	390	364	−23.5	42.5	37.8	−5.5	8.2	7.1
Persons engaged	32,522	28,301	21,950	16,091	13,654	(2)	(2)	14.9	28.9	36.4	17.8	.....	.....
Proprietors and firm members	219	373	323	294	361	(2)	(2)	−41.3	15.5	9.9	−18.6	.....	.....
Salaried employees	6,007	5,113	3,317	1,613	1,712	(2)	(2)	17.5	54.1	105.6	−5.8	.....	.....
Wage earners (average number)	26,296	22,815	18,310	14,184	11,581	9,026	8,598	15.3	24.6	29.1	22.5	(3)	(3)
Primary horsepower	125,939	114,281	64,711	47,989	38,680	28,240	(2)	10.2	76.6	34.8	24.1	37.0	.....
Capital	$311,633,269	$217,064,890	$121,537,451	$68,917,264	$60,685,753	$40,594,168	$17,913,660	43.6	78.6	76.4	13.6	49.5	126.6
Salaries and wages	36,934,732	17,774,447	11,882,815	7,061,139	6,310,261	4,671,831	2,648,422	107.8	49.6	68.3	11.9	35.1	76.4
Salaries	11,571,600	7,242,442	4,405,636	1,933,992	2,124,972	(2)	(2)	59.8	64.4	127.8	−9.0	.....	.....
Wages	25,363,132	10,532,005	7,477,179	5,127,147	4,185,289	(2)	(2)	140.8	40.9	45.8	22.5	.....	.....
Paid for contract work	171,318	192,859	36,935	43,632	23,493	(2)	(2)	−11.2	422.2	−15.3	85.7	.....	.....
Rent and taxes	8,475,314	1,271,417	816,242	[4] 326,177	[4] 384,611	(2)	(2)	566.6	55.8	.....	.....	.....	.....
Cost of materials	185,040,522	107,954,644	69,521,920	39,287,914	28,958,473	25,113,874	15,595,078	71.4	55.3	76.9	35.7	15.3	61.0
Value of products	281,143,587	153,196,152	103,960,213	56,541,253	44,657,385	39,180,844	23,650,795	83.5	47.4	83.9	26.6	14.0	65.7
Value added by manufacture[5]	96,103,065	45,241,508	34,438,293	17,253,339	15,698,912	14,066,970	8,055,717	112.4	31.4	99.6	9.9	11.6	74.6

[1] A minus sign (−) denotes decrease. [2] Figures not available. [3] Figures not strictly comparable. [4] Exclusive of internal revenue. [5] Value of products less cost of materials.

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

STATE.	Number of establishments	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	600	26,296	100.0	....	$281,144	100.0	....	$96,103	100.0	....
Georgia	144	4,152	15.8	1	47,480	16.9	1	16,713	17.4	1
Maryland	45	3,102	11.8	2	37,014	13.2	2	12,319	12.8	2
South Carolina	50	2,765	10.5	3	30,412	10.8	3	10,983	11.4	3
North Carolina	45	2,077	7.9	5	27,551	9.8	4	8,945	9.3	4
Virginia	43	2,354	9.0	4	22,891	8.1	5	8,693	9.0	5
New Jersey	19	1,740	6.6	6	15,758	5.6	6	3,947	4.1	8
Ohio	23	1,197	4.6	8	14,042	5.0	7	5,971	6.2	6
Alabama	40	1,136	4.3	9	11,625	4.1	8	4,049	4.2	7
Florida	24	1,390	5.3	7	10,686	3.8	9	3,528	3.7	10
Pennsylvania	31	1,021	3.9	10	8,731	3.1	10	2,886	3.0	11
Tennessee	10	821	3.1	12	6,842	2.4	11	2,830	3.0	12
Illinois	12	953	3.6	11	6,160	2.2	12	2,437	2.5	13
Indiana	13	328	1.2	16	$4,713	1.7	14	$1,980	2.1	14
Louisiana	6	584	2.2	13	4,197	1.5	15	1,563	1.6	15
Maine	10	174	0.7	22	4,055	1.4	16	978	1.0	19
Mississippi	9	370	1.4	15	3,627	1.3	18	959	1.0	20
California	17	284	1.1	19	3,610	1.3	19	1,077	1.1	17
Connecticut	6	188	0.7	21	3,599	1.3	20	1,042	1.1	18
Texas	9	190	0.7	20	1,593	0.6	22	492	0.5	22
Kentucky	4	81	0.3	24	1,000	0.4	25	265	0.3	25
Delaware	7	41	0.2	26	630	0.2	26	120	0.1	26
All other states	33	1,348	5.1	....	14,928	5.3	....	4,326	4.5	...

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	32,522	31,292	1,230	96.2	3.8
	1914	28,301	27,713	588	97.9	2.1
	1909	21,950	21,547	403	98.2	1.8
Proprietors and officials	1919	2,133	2,086	47	97.8	2.2
	1914	1,930	1,906	24	98.8	1.2
	1909	1,323	1,313	10	99.2	0.8
Proprietors and firm members	1919	219	209	10	95.4	4.6
	1914	373	357	16	95.7	4.3
	1909	323	316	7	97.8	2.2
Salaried officers of corporations	1919	623	592	31	95.0	5.0
	1914	642	635	7	98.9	1.1
	1909	406	404	2	99.5	0.5
Superintendents and managers	1919	1,291	1,285	6	99.5	0.5
	1914	915	914	1	99.9	0.1
	1909	594	593	1	99.8	0.2
Clerks and other subordinate salaried employees	1919	4,093	3,318	775	81.1	18.9
	1914	3,556	3,090	466	86.9	13.1
	1909	2,317	2,042	275	88.1	11.9
Wage earners (average number)	1919	26,296	25,888	408	98.4	1.6
	1914	22,815	22,717	98	99.6	0.4
	1909	18,310	18,192	118	99.4	0.6
16 years of age and over	1919	26,228	25,820	408	98.4	1.6
	1914	22,785	22,687	98	99.6	0.4
	1909	18,243	18,125	118	99.4	0.6
Under 16 years of age	1919	68	68	.....	100.0	.....
	1914	30	30	.....	100.0	.....
	1909	67	67	.....	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 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	26,296	27,808	31,043	**38,357**	36,465	23,856	*21,071*	21,731	22,500	25,205	22,028	21,897	23,591	54.9
Males	25,888	27,289	30,530	**37,881**	36,038	23,521	*20,791*	21,459	22,230	24,813	21,552	21,408	23,144	54.9
Females	408	519	513	476	427	335	280	272	*270*	392	476	489	447	52.0
1914	22,815	22,571	30,647	38,332	32,977	21,793	18,286	17,603	18,041	20,863	18,249	17,564	*16,854*	44.0
1909	18,310	17,076	24,106	29,310	23,198	16,737	14,506	*14,264*	15,514	18,163	16,232	15,095	15,425	48.7
Alabama	1,136	1,130	1,519	2,212	1,998	1,018	*787*	774	816	789	827	872	940	33.3
Florida	1,390	1,281	1,390	1,663	1,566	1,467	1,478	1,229	*1,070*	1,239	1,292	1,387	1,618	64.3
Georgia	4,152	4,639	6,059	8,512	7,561	3,125	2,562	2,550	*2,535*	2,589	2,627	3,074	3,991	29.8
Illinois	953	940	929	1,005	937	839	833	1,133	1,138	1,246	863	787	*786*	63.1
Maryland	3,102	3,032	3,176	3,701	3,647	3,243	2,924	2,817	3,087	3,218	2,863	*2,668*	2,848	72.1
New Jersey	1,740	1,824	2,136	2,222	1,923	1,719	1,600	1,566	*1,465*	1,632	1,586	1,609	1,598	65.9
North Carolina	2,077	2,106	2,292	3,115	3,487	1,913	*1,428*	1,595	1,584	1,978	1,956	1,733	1,748	41.0
Ohio	1,197	1,085	1,313	1,465	1,206	997	964	1,015	1,373	2,185	1,001	890	*870*	39.8
Pennsylvania	1,021	1,359	1,324	1,251	1,148	829	777	872	960	1,022	897	894	919	57.2
South Carolina	2,765	3,457	3,865	4,763	4,364	2,326	1,994	1,923	1,954	2,079	*1,787*	2,025	2,643	37.5
Tennessee	821	786	858	1,232	1,334	762	*512*	592	844	1,113	681	557	591	38.4
Virginia	2,354	1,936	1,969	2,600	3,029	2,113	2,386	2,527	2,362	2,562	2,566	2,357	*1,841*	60.8

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	26,296	574	211	1,608	921	3,624	10,238	8,395	725
	1914	22,815	(2)	(2)	281	500	2,656	3,061	14,282	2,035
	1909	18,310	(2)	(2)	51	22	332	806	14,502	2,597
Alabama	1919	1,136	.....	.....	.....	.....	150	508	303	175
	1914	1,416	(2)	(2)	3	10	31	102	1,020	250
Florida	1919	1,390	3	.....	126	3	181	427	650	.....
	1914	781	(2)	(2)	4	.....	271	100	399	7
Georgia	1919	4,152	140	174	178	56	32	2,068	1,298	206
	1914	3,833	(2)	(2)	41	121	542	837	2,163	129
Illinois	1919	953	18	.....	670	.....	2	.....	221	42
	1914	696	(2)	(2)	10	.....	422	67	167	30
Louisiana	1919	584	.....	.....	.....	.....	146	334	.....	104
	1914	408	.....	.....	.....	97	102	.....	209	.....
Maryland	1919	3,102	21	.....	42	28	635	1,130	1,246	.....
	1914	1,991	(2)	(2)	73	40	109	121	1,633	15
New Jersey	1919	1,740	2	.....	7	356	1,074	197	104	.....
	1914	1,530	(2)	(2)	13	26	66	46	1,236	143
North Carolina	1919	2,077	63	.....	68	88	.....	1,408	397	53
	1914	1,690	(2)	(2)	5	9	66	501	983	126
Ohio	1919	1,197	76	.....	.....	116	95	646	203	61
	1914	1,005	(2)	(2)	49	66	66	114	536	174
Pennsylvania	1919	1,021	.....	.....	1	32	37	315	635	1
	1914	1,110	(2)	(2)	3	18	38	12	1,024	15
South Carolina	1919	2,765	.....	.....	5	204	39	1,704	792	21
	1914	2,050	(2)	(2)	20	76	.....	365	1,507	82
Tennessee	1919	821	167	.....	18	.....	.....	395	241	.....
	1914	706	.....	.....	.....	.....	160	.....	383	163
Virginia	1919	2,354	13	.....	20	12	386	772	1,151	.....
	1914	2,470	(2)	(2)	33	2	88	124	1,527	696

[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 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.		Over 500 wage earners.	
			Establishments.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States 1919	600	26,296	5	196	584	134	1,576	1,111	3,946	79	5,705	61	9,420	12	3,860	2	1,205
1914	784	22,815	7	330	928	200	2,172	101	3,385	89	6,448	50	7,206	7	2,676	.....	.....
Alabama	40	1,136	.....	21	71	1	10	10	382	7	524	1	149	.....	.....	.....	.....
Florida	24	1,390	.....	8	21	4	54	4	167	1	76	7	1,072	.....	.....	.....	.....
Georgia	144	4,152	2	56	154	38	408	21	754	16	1,154	11	1,682	.....	.....	.....	.....
Illinois	12	953	1	2	8	3	35	2	67	2	149	1	112	.....	.....	1	582
Louisiana	6	584	.....	.....	.....	.....	.....	2	68	1	72	3	444	.....	.....	.....	.....
Maryland	45	3,102	.....	16	37	10	128	5	173	6	438	3	498	4	1,205	1	623
New Jersey	19	1,740	.....	6	19	4	44	1	36	3	248	2	307	3	1,086	.....	.....
North Carolina	45	2,077	.....	6	22	11	137	13	444	10	681	5	793	.....	.....	.....	.....
Ohio	23	1,197	.....	4	10	3	43	5	198	8	591	3	355	.....	.....	.....	.....
Pennsylvania	31	1,021	.....	16	38	9	97	3	104	.....	.....	2	340	1	442	.....	.....
South Carolina	50	2,765	.....	9	34	12	141	14	473	6	439	7	1,004	2	584	.....	.....
Tennessee	10	821	.....	2	7	1	18	2	57	2	142	2	343	1	254	.....	.....
Virginia	43	2,354	.....	9	40	9	119	8	313	9	626	8	1,256	.....	.....	.....	.....

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	600	784	550	26,296	22,815	18,310	$281,143,587	$153,196,152	$103,960,213	$96,103,065	$45,241,508	$34,438,293
Less than $5,000	16	50	54	18	73	67	47,881	139,999	134,901	21,324	63,587	65,962
$5,000 to $20,000	59	130	95	172	430	295	748,054	1,499,136	1,103,092	294,571	497,622	402,193
$20,000 to $100,000	143	296	180	957	2,497	1,828	7,986,830	15,329,941	8,668,288	2,324,991	3,799,132	2,762,302
$100,000 to $500,000	202	225	211	4,816	14,308	13,330	50,761,280	56,559,037	76,746,170	16,082,679	28,697,899	25,800,348
$500,000 to $1,000,000	94	59		6,237			69,281,192	42,904,832		26,249,213		
$1,000,000 and over	86	24	10	24,096	5,507	2,790	152,318,350	36,763,207	17,307,762	51,130,287	12,183,268	5,407,488
	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	2.7	6.4	9.8	(1)	0.3	0.4	(1)	0.1	0.1	(1)	0.1	0.2
$5,000 to $20,000	9.8	16.6	17.3	0.5	1.9	1.6	0.3	1.0	1.1	0.3	1.1	1.2
$20,000 to $100,000	23.8	37.8	32.7	2.6	10.9	10.0	2.8	10.0	8.3	2.4	8.4	8.0
$100,000 to $500,000	33.7	28.7	38.4	13.3	62.7	72.8	18.1	36.9	73.8	16.7	63.4	74.9
$500,000 to $1,000,000	15.7	7.5		17.2			24.6	28.0		27.3		
$1,000,000 and over	14.3	3.1	1.8	66.4	24.1	15.2	54.2	24.0	16.6	53.2	26.9	15.7

[1] Less than one-tenth of 1 per cent.

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

STATE.	Census 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.	
		Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States.	1919	55	482	63	26,296	377	25,291	628	1.4	96.2	2.4	$281,143,587	$4,412,170	$270,173,402	$6,558,015	1.6	96.1	2.3
	1914	94	582	108	22,815	447	21,537	831	2.0	94.4	3.6	153,196,152	2,477,012	144,912,161	5,806,979	1.6	94.6	3.8
	1909	95	369	86	18,310	354	17,166	790	1.9	93.8	4.3	103,960,213	1,907,199	98,006,672	4,046,342	1.8	94.3	3.9
Alabama	1919	2	36	2	1,136	.....	1,099	[1] 37	.....	96.7	3.3	11,624,913	.....	11,173,238	[1] 451,675	.....	96.1	3.9
	1914	5	68	7	1,416	15	1,366	35	1.1	96.5	2.5	10,869,679	119,650	10,231,495	518,534	1.1	94.1	4.8
California	1919	2	14	1	234	[2] 16	268	.....	5.6	94.4	.....	3,609,704	[2] 356,794	3,252,910	.....	9.9	90.1	.....
	1914	1	14	1	196	.....	[2] 196	.....	.....	100.0	.....	2,330,761	.....	[2] 2,330,761	.....	.....	100.0	.....
Florida	1919	.....	22	2	1,390	.....	[3] 1,390	.....	.....	100.0	.....	10,685,819	.....	[3] 10,685,819	.....	.....	100.0	.....
	1914	2	19	1	781	[2] 18	763	.....	2.3	97.7	.....	6,995,051	63,095	6,931,956	.....	0.9	99.1	.....
Georgia	1919	13	112	19	4,152	41	3,829	282	1.0	92.2	6.8	47,479,842	522,780	44,705,560	2,251,502	1.1	94.2	4.7
	1914	22	168	40	3,833	50	3,502	281	1.3	91.4	7.3	29,045,903	461,049	26,225,456	2,359,398	1.6	90.3	8.1
Illinois	1919	1	10	1	953	.....	[3] 953	.....	.....	100.0	.....	6,159,817	.....	[3] 6,159,817	.....	.....	100.0	.....
	1914	1	9	2	696	.....	678	[1] 18	.....	97.4	2.6	3,775,287	.....	3,742,619	[1] 32,668	.....	99.1	0.9
Indiana	1919	3	10	.....	328	16	312	.....	4.9	95.1	.....	4,713,067	142,560	4,570,507	.....	3.0	97.0	.....
	1914	4	7	3	193	18	167	8	9.3	86.5	4.1	1,135,794	62,409	1,062,509	10,876	5.5	93.5	1.0
Louisiana	1919	.....	6	.....	584	.....	584	.....	.....	100.0	.....	4,197,285	.....	4,197,285	.....	.....	100.0	.....
	1914	.....	6	.....	408	.....	408	.....	.....	100.0	.....	2,818,455	.....	2,818,455	.....	.....	100.0	.....
Maine	1919	1	6	3	174	.....	131	[1] 43	.....	75.3	24.7	4,054,698	.....	3,741,687	[1] 313,011	.....	92.3	7.7
	1914	1	5	2	155	.....	103	[1] 52	.....	66.5	33.5	1,583,481	.....	1,316,998	[1] 266,483	.....	83.2	16.8
Maryland	1919	6	32	7	3,102	50	3,008	44	1.6	97.0	1.4	37,014,097	480,472	36,104,218	429,407	1.3	97.5	1.2
	1914	9	29	10	1,991	83	1,847	61	4.2	92.8	3.1	13,986,704	409,025	13,162,182	415,497	2.9	94.1	3.0
Mississippi	1919	.....	9	.....	370	.....	370	.....	.....	100.0	.....	3,626,674	.....	3,626,674	.....	.....	100.0	.....
	1914	2	9	.....	379	.....	[1] 379	.....	.....	100.0	.....	2,059,786	.....	[1] 2,059,786	.....	.....	100.0	.....
New Jersey	1919	2	13	4	1,740	.....	1,701	[1] 39	.....	97.8	2.2	15,758,105	.....	15,091,537	[1] 666,568	.....	95.8	4.2
	1914	4	14	5	1,530	78	1,415	37	5.1	92.5	2.4	11,197,690	171,174	10,792,490	234,026	1.5	96.4	2.1
North Carolina	1919	3	39	3	2,077	41	2,002	34	2.0	96.4	1.6	27,551,316	726,637	26,471,882	352,797	2.6	96.1	1.3
	1914	4	33	4	1,690	52	1,611	27	3.1	95.3	1.6	10,307,856	384,074	9,882,332	41,450	3.7	95.9	0.4
Ohio	1919	1	22	.....	1,197	.....	[1] 1,197	.....	.....	100.0	.....	14,042,055	.....	[1] 14,042,055	.....	.....	100.0	.....
	1914	3	20	1	1,005	[2] 6	999	.....	0.6	99.4	.....	7,245,998	[2] 34,674	7,211,324	.....	0.5	99.5	.....
Pennsylvania	1919	8	16	7	1,021	39	962	20	3.8	94.2	2.0	8,731,281	432,283	8,032,642	266,356	5.0	92.0	3.1
	1914	15	16	16	1,110	44	1,001	65	4.0	90.2	5.9	6,177,610	226,342	5,658,021	293,247	3.7	91.6	4.7
South Carolina	1919	3	46	1	2,765	[2] 53	2,712	.....	1.9	98.1	.....	30,411,575	[2] 512,062	29,899,513	.....	1.7	98.3	.....
	1914	2	52	1	2,050	[2] 6	2,044	.....	0.3	99.7	.....	13,824,659	[2] 81,586	13,743,073	.....	0.6	99.4	.....
Tennessee	1919	2	8	.....	821	.....	[1] 821	.....	.....	100.0	.....	6,841,797	.....	[1] 6,841,797	.....	.....	100.0	.....
	1914	1	12	2	706	.....	595	[1] 111	.....	84.3	15.7	4,372,427	.....	4,121,727	[1] 250,700	.....	94.3	5.7
Virginia	1919	1	40	2	2,354	.....	2,324	[1] 30	.....	98.7	1.3	22,891,353	.....	22,482,233	[1] 409,120	.....	98.2	1.8
	1914	4	51	2	2,470	[2] 103	2,367	.....	4.2	95.8	.....	11,350,120	[2] 776,373	10,573,747	.....	6.8	93.2	.....

[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.					
				Amount.			Per cent distribution.		
	1919	1914	1909	1919	1914	1909	1919	1914	1909
Primary power, total	4,556	3,022	1,338	125,930	114,281	64,711	100.0	100.0	100.0
Owned	798	1,117	900	46,053	66,476	51,967	36.6	58.2	80.3
Steam[1]	555	843	804	40,482	60,353	49,777	32.1	52.8	76.9
Engines	549	(2)	(2)	39,274	(2)	(2)	31.2	.....	.....
Turbines	6	(2)	(2)	1,208	(2)	(2)	0.9	.....	.....
Internal-combustion engines	219	258	83	4,862	5,786	1,825	3.9	5.1	2.8
Water wheels, turbines, and motors	24	16	13	709	337	365	0.6	0.3	0.6
Rented	3,758	1,905	438	79,886	47,805	12,744	63.4	41.8	19.7
Electric	3,758	1,905	438	79,886	47,450	12,579	63.4	41.5	19.4
Other	.....	.....	.....	.....	355	165	.....	0.3	0.3
Electric	4,535	2,795	761	93,111	65,266	19,238	100.0	100.0	100.0
Rented	3,758	1,905	438	79,886	47,450	12,579	85.8	72.7	65.4
Generated by establishments reporting	777	890	323	13,225	17,816	6,659	14.2	27.3	34.6

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

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

STATE.	Census 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	12,749	349,612	1,306	64,442	6,933	54,397
	1914	13,451	433,359	2,033	27,851	(2)	49,631
Per cent of increase.[3]	.....	−5.2	−19.3	−35.8	156.5	(2)	9.6
Alabama	1919	.....	29,981	57	1,903	131	.....
	1914	15	31,893	30	674	(2)	.....
California	1919	.....	.....	.....	11,610	195	12,203
	1914	.....	33	.....	13,588	(2)	.....
Connecticut	1919	125	1,217	.....	.....	.....	.....
Delaware	1919	26	282	.....	.....	20	.....
Florida	1919	127	8,526	.....	19,435	2,623	.....
	1914	.....	7,250	.....	2,216	(2)	.....
Georgia	1919	.....	14,496	6	1,420	986	140
	1914	.....	22,807	20	1,564	(2)	334
Illinois	1919	.....	25,756	.....	3,989	.....	.....
	1914	.....	18,458	.....	3,973	(2)	.....
Indiana	1919	.....	5,403	.....	.....	72	.....
	1914	150	4,175	.....	26	(2)	.....
Kentucky	1919	.....	1,671	.....	.....	.....	125
Louisiana	1919	.....	7,242	.....	.....	.....	31,500
	1914	.....	2,788	.....	.....	.....	18,373
Maine	1919	11	320	.....	.....	10	.....
	1914	.....	775	.....	225	(2)	.....
Maryland	1919	199	27,204	75	3,151	157	.....
	1914	80	25,314	.....	170	(2)	21
Mississippi	1919	.....	3,537	.....	.....	20	.....
	1914	.....	6,245	.....	25	(2)	.....
New Jersey	1919	5,545	47,276	527	987	195	.....
	1914	8,279	39,290	.....	103	(2)	.....
North Carolina	1919	951	20,285	139	230	1,323	.....
	1914	.....	26,466	.....	1,217	(2)	.....
Ohio	1919	.....	25,826	.....	.....	.....	8,681
	1914	.....	34,519	.....	46	(2)	11,153
Pennsylvania	1919	394	32,726	200	.....	13	414
	1914	2,391	50,267	1,983	107	(2)	19,050
South Carolina	1919	250	20,162	.....	60	532	.....
	1914	.....	25,017	.....	154	(2)	.....
Tennessee	1919	.....	13,530	.....	2,987	.....	.....
	1914	.....	27,333	.....	2	.....	.....
Texas	1919	.....	22	.....	10,193	360	.....
	1914	.....	94	.....	20	(2)	400
Virginia	1919	1,209	28,656	.....	2,418	158	.....
	1914	954	56,284	.....	305	(2)	.....
All other states	1919	3,912	35,494	302	6,059	138	1,334
	1914	1,582	54,351	.....	3,436	(2)	300

[1] Includes some semianthracite coal. [2] Included in figures for fuel oils. [3] A minus sign (−) denotes decrease.

SPECIAL STATISTICS.

Certain additional information concerning the quantity and value of materials and products for the industry is collected, by means of supplemental schedules, data for which are presented in Tables 11 to 13.

Materials and products.—Table 11 presents comparative statistics for materials and products, and number of establishments, for the census years 1919, 1914, 1909, and 1904. Prior to the World War, the consumption of potash salts in the manufacture of fertilizers had increased rapidly, but the consumption in 1919 was but little more than one-half of that in 1914. The average unit cost, however, was $67.80 in 1919 as compared with $24.10 in 1914, and $28.50 in 1909. The imports of potash of all kinds and for all purposes in 1919 was 45,112 net tons, valued at $3,616,100 as compared with 242,909 net tons, valued at $8,743,973 in 1914.

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

[Ton, 2,000 pounds.]

	1919	1914	1909	1904
Number of establishments	809	1,238	843	552
Fertilizer industry	600	784	550	399
Manufacturing fertilizers as subsidiary products	[1] 209	454	293	153
MATERIALS.				
Total cost	$193,034,389	$119,222,003	$73,165,544	
The fertilizer industry	$185,040,522	$107,954,844	$69,521,920	$39,287,914
Other industries producing fertilizers as subsidiary products	$7,993,867	$11,267,359	$3,643,624	(2)
Cottonseed meal:				
Tons	230,526	325,234	842,557	(2)
Cost	$12,530,636	$8,419,383	$17,200,611	$2,376,448
Tankage and ammoniates, not elsewhere specified:				
Tons	689,753	887,934		(2)
Cost	$29,949,569	$20,131,141		$7,539,200
Fish:				
Tons	273,252	250,110	242,045	(2)
Cost	$5,878,634	$3,111,991	$3,066,613	$847,142
Ammonium sulphate:				
Tons	135,882	149,924	65,592	10,540
Cost	$12,659,005	$9,015,163	$3,732,112	$600,856
Cyanamid or lime nitrogen:				
Tons	16,926	25,911	(2)	(2)
Cost	$1,329,149	$1,176,119	(2)	(2)
Nitrate of soda:				
For acid manufacture—				
Tons	21,732	15,134	89,846	42,213
Cost	$1,692,614	$704,581	$3,916,320	$1,760,432
For mixed fertilizer—				
Tons	130,683	147,050		
Cost	$10,091,790	$6,807,228		
Phosphate rock:				
Tons	2,247,325	2,080,961	1,549,497	888,571
Cost	$17,926,097	$11,222,992	$8,828,234	$4,244,554
Bone discard:				
Tons	12,769	3,395	(2)	(2)
Cost	$252,726	$35,007	(2)	(2)
Raw bones:				
Tons	81,304	64,590	(2)	(2)
Cost	$3,093,364	$1,603,353	(2)	(2)
Steamed bone:				
Tons	59,227	55,067	(2)	(2)
Cost	$1,815,554	$1,178,959	(2)	(2)
Ground bone, raw:				
Tons	16,471	25,139	(2)	(2)
Cost	$707,034	$593,226	(2)	(2)
Pyrites:				
Tons	398,602	613,842	456,574	342,962
Cost	$3,919,050	$3,590,235	$2,831,994	$2,020,759
Sulphur:				
Tons	221,558	2,041	4,236	4,210
Cost	$5,669,331	$42,716	$68,924	$92,234
Sulphuric acid:				
Purchased—				
Tons	636,632	728,889	620,708	197,865
Cost	$6,683,061	$4,387,317	$3,460,132	$1,084,304
Made and consumed, tons	1,568,577	1,276,715	841,935	692,904
Superphosphate:				
Purchased—				
Tons	1,200,182	1,096,178	532,886	320,559
Cost	$18,485,969	$9,301,501	$5,175,957	$2,912,010
Made and consumed (acid phosphate), tons	3,316,486	2,723,317	1,838,865	884,211
Basic slag or Thomas phosphate powder:				
Tons	11,394	16,190	(2)	(2)
Cost	$118,768	$144,213	(2)	(2)
Guano:				
Tons	33,053	120,128	(2)	(2)
Cost	$393,933	$445,416	(2)	(2)
Kainit:				
Tons	31,145	448,885	347,104	160,493
Cost	$920,614	$3,939,263	$3,008,183	$1,891,073
Potash salts:				
Tons	274,992	529,973	270,459	122,107
Cost	$18,653,390	$12,774,113	$7,714,367	$3,606,701
Muriate of potash—				
Tons	32,900	177,372	(2)	(2)
Cost	$3,905,784	$6,497,364	(2)	(2)
Sulphate of potash—				
Tons	79,482	39,232	(2)	(2)
Cost	$2,753,126	$1,684,998	(2)	(2)
Double manure salts—				
Tons	17,560	108,580	(2)	(2)
Cost	$902,843	$1,740,241	(2)	(2)
Nitrate of potash or saltpeter—				
Tons	11,751	507	(2)	(2)
Cost	$1,199,814	$28,287	(2)	(2)
Other potash salts—				
Tons	133,299	[3] 204,282	(2)	(2)
Cost	$9,891,823	$2,523,223	(2)	(2)
Hardwood ashes:				
Tons	9,085	4,437	(2)	(2)
Cost	$96,569	$54,171	(2)	2,050
All other materials, cost	$39,607,532	$20,543,915	$14,161,497	$10,310,151
PRODUCTS.				
Total value	$306,523,899	$169,017,550	$111,871,481	$63,008,593
Fertilizer industry	$281,143,587	$153,196,152	$103,960,213	$56,541,253
Fertilizers, subsidiary products of other industries	$25,380,312	$15,821,398	$7,911,268	$6,467,340
Fertilizers:				
Tons	8,237,011	8,432,206	5,618,234	3,591,771
Value	$284,544,523	$153,260,212	$100,089,971	$56,928,034
Average unit value, ton	$34.50	$18.20	$17.80	$15.80
Complete and ammoniated fertilizers—				
Tons	4,756,440	5,612,421	3,523,759	2,385,201
Value	$200,106,419	$121,676,386	$74,109,307	$44,325,882
Superphosphates [4]—				
Production, tons	5,712,158	4,416,022	3,062,834	1,670,978
For sale—				
Tons	2,395,672	1,692,705	1,223,969	786,767
Value	$46,221,930	$14,778,654	$13,744,831	$7,821,096
Made and consumed, tons	3,316,486	2,723,317	1,838,865	884,211
Concentrated phosphates—				
Tons	119,609	67,585	270,128	(2)
Value	$3,828,417	$1,367,005	$2,713,513	(2)
Other fertilizers—				
Tons	965,290	1,059,495	600,378	419,803
Value	$34,387,757	$15,433,167	$9,522,320	$4,781,056
Sulphuric acid (basis of 50° Baumé):				
Production, tons	1,877,394	1,405,768	995,384	717,406
For sale—				
Tons	308,817	129,053	153,449	24,502
Value	$3,639,010	$768,873	$928,582	$194,578
Made and consumed, tons	1,568,577	1,276,715	841,935	692,904
Fish scrap:				
Tons	47,542	62,930	78,484	(2)
Value	$3,170,691	$1,915,530	$2,006,724	(2)
Pyrite cinder:				
Tons	[5] 116,444	[5] 245,082	[5] 291,653	(2)
Value	$169,420	$231,869	$143,607	(2)
Oil:				
Gallons	[6] 2,118,092	2,445,026	3,218,393	(2)
Value	$1,831,194	$778,337	$810,938	(2)
Bone black:				
Pounds	44,597,838	41,054,769	(2)	(2)
Value	$2,227,113	$1,413,166	(2)	(2)
Glue, value	$2,171,055	$1,131,243	(2)	(2)
Grease, value	$2,015,033	$1,209,334	(2)	(2)
All other products, value	[7] $6,755,860	[7] $8,308,986	$7,891,659	$5,885,981

[1] Includes 94 cottonseed-oil mills, 32 grease and tallow rendering establishments, 51 slaughtering and meat-packing plants, and 32 establishments distributed among 13 other industries that produce wastes of fertilizer value.
[2] Figures not available.
[3] Includes 17,430 tons reported as "potash salts."
[4] Includes fertilizers reported as ammoniated fertilizers but containing both superphosphates and potash, viz: In 1919, 1,271,215 tons; 1914, 1,519,156 tons; 1909, 522,389 tons; and 1904, 775,987 tons.
[5] Not including 116,987 tons in 1919; 155,634 tons in 1914, and 72,402 tons in 1909, of no value.
[6] Includes fish oil, 1,759,174 gallons, $1,441,989; neats'-foot oil, 165,195 gallons, $131,745; cottonseed oil, 103,723 gallons, $257,460.
[7] Includes chemicals (soda products, acids, etc.) to the value of $1,039,068 in 1919, and $400,597 in 1914.

Sulphuric acid.—The industry is a large consumer of sulphuric acid, and of the total production by all establishments, totaling 5,491,528 tons on the basis of 50° acid, 2,168,825 tons, or approximately 40 per cent, were used in the manufacture of fertilizers, and the bulk of this was manufactured by the consuming establishment.

Table 12 shows, by states, the quantity of sulphuric acid made and consumed by establishments in the industry, together with the quantity purchased, by states. Of the total quantity consumed, 72.3 per cent were manufactured within the industry, and 27.7 per cent were purchased in 1919 as compared with 63.7 per cent manufactured and 36.3 per cent purchased in 1914. In addition to the sulphuric acid made and consumed within the industry, 308,817 tons were manufactured and sold. Assuming this to have been sold to fertilizer plants within the industry and included in the quantity of sulphuric acid purchased, the industry would appear to have produced more than seven-tenths of the sulphuric acid consumed in the manufacture of fertilizers.

TABLE 12.—CONSUMPTION OF SULPHURIC ACID, BY STATES: 1919 AND 1914.

STATE.	Census year.	Total (tons).	MADE AND CONSUMED.		Purchased (tons).
			Number of establishments.	Tons.	
United States	1919	2,168,825	119	1,568,577	600,248
	1914	2,005,604	128	1,276,715	728,889
Alabama	1919	113,189	12	96,611	16,578
	1914	156,452	9	72,242	84,210
Florida	1919	47,231	5	47,231	.....
	1914	46,615	4	45,506	1,109
Georgia	1919	322,806	27	252,899	69,907
	1914	386,818	34	282,176	104,642
Louisiana	1919	81,362	4	62,845	18,517
	1914	66,334	4	31,016	35,318
Maryland	1919	442,411	6	330,928	111,483
	1914	304,509	6	110,568	193,941
Mississippi	1919	61,250	5	43,352	17,898
	1914	51,576	5	42,406	9,170
New Jersey	1919	83,420	4	73,239	10,181
	1914	127,712	6	88,041	39,671
North Carolina	1919	167,503	11	110,590	56,913
	1914	160,143	12	129,307	30,836
Ohio	1919	187,072	8	88,360	98,712
	1914	107,993	6	73,242	34,751
South Carolina	1919	218,594	14	164,835	53,759
	1914	190,715	13	160,327	30,388
Tennessee	1919	96,981	4	82,374	14,607
	1914	89,775	4	70,750	19,025
Virginia	1919	112,462	8	95,236	17,226
	1914	116,683	8	93,071	23,612
All other states	1919	234,544	11	120,077	114,467
	1914	200,279	17	78,063	122,216

Products, by principal states.—Table 13 gives detailed statistics of fertilizer products, by kinds and by states, for 1919 and 1914, the states being ranked according to tonnage in 1919. The figures show a slight decrease in total tonnage for the census interval, with an increase in value and average unit value for all classes of fertilizers, increasing from $18.20 in 1914 to $34.50 in 1919.

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

PRODUCT AND STATE.	1919		1914	
	Tons.	Value.	Tons.	Value.
FERTILIZERS, total	8,237,011	$284,544,523	8,432,206	$153,260,212
Georgia	1,423,712	49,219,786	1,749,465	30,408,787
Maryland	1,209,676	35,005,810	875,996	13,488,084
South Carolina	845,802	31,367,837	733,753	14,095,858
North Carolina	794,135	31,902,546	635,230	11,702,757
Virginia	532,837	20,358,826	541,690	9,524,113
Ohio	498,376	13,594,361	339,353	6,313,075
New Jersey	405,552	15,225,445	475,821	10,281,447
Alabama	384,021	11,677,053	687,043	10,983,528
Illinois	275,326	9,067,939	294,802	4,565,435
Florida	254,556	9,964,055	246,506	6,290,067
Tennessee	243,498	6,721,564	329,457	4,408,922
Pennsylvania	224,152	7,193,126	276,088	5,296,917
Louisiana	162,926	5,228,313	221,434	3,696,424
Indiana	142,702	4,385,106	56,889	1,049,526
Mississippi	122,726	3,909,981	159,269	2,383,019
California	74,224	3,835,358	69,977	2,094,371
Connecticut	57,610	3,578,737	59,156	1,948,194
Maine	54,784	4,041,271	51,465	1,590,756
Kentucky	29,820	926,192	67,879	959,366
Texas	29,784	1,217,490	35,685	845,375
Delaware	16,551	585,925	25,201	505,918
All other states	454,181	15,537,802	500,553	10,917,373
	State.		State.	
Average unit value, ton	.....	34.50	.....	18.20
Maximum	Maine	73.77	Conn.	32.93
Minimum	New York	25.21	Tenn.	13.38
Complete and ammoniated fertilizers	Tons. 4,756,440	$200,106,419	Tons. 5,612,421	$121,676,386
Georgia	1,004,717	39,855,409	1,155,559	24,387,229
South Carolina	545,642	24,218,733	491,076	11,199,158
Maryland	486,104	20,937,554	516,958	10,013,331
North Carolina	403,161	21,096,263	458,295	9,999,225
Virginia	361,802	16,329,418	375,256	7,576,028
New Jersey	256,403	11,990,054	353,310	8,723,747
Alabama	208,872	7,704,149	403,135	8,111,405
Ohio	206,084	6,496,781	218,601	4,496,321
Florida	175,746	8,618,976	200,663	5,720,326
Illinois	156,057	5,173,346	251,654	4,095,958
Pennsylvania	152,529	5,226,781	171,461	3,818,919
Louisiana	94,359	3,556,830	132,287	2,558,982
Indiana	87,065	2,707,609	41,318	787,466
Tennessee	75,458	2,816,787	164,109	2,871,655
Connecticut	55,445	3,471,617	49,533	1,661,626
Maine	52,980	3,934,620	50,554	1,574,590
Mississippi	51,898	2,120,381	95,359	1,867,251
California	45,433	2,600,055	44,456	1,639,686
Texas	12,848	507,612	32,807	794,488
Delaware	12,175	465,965	21,888	471,093
Kentucky	3,794	135,227	14,926	316,786
All other states	247,868	10,142,172	369,216	8,991,116
	State.		State.	
Average unit value, ton	.....	42.07	.....	21.68
Maximum	Maine	74.27	Calif.	36.88
Minimum	Indiana	31.10	Illinois	16.28
Superphosphates and concentrated phosphates	Tons. 2,515,281	$50,050,347	Tons. 1,760,290	$16,145,859
Maryland	635,856	10,661,824	228,045	2,006,040
Georgia	341,515	6,228,256	459,783	4,138,243
South Carolina	249,145	4,899,295	182,407	1,642,797
North Carolina	206,231	5,210,407	147,694	1,285,889
Ohio	187,164	4,719,899	69,927	969,903
Virginia	152,305	3,416,931	76,130	669,654
Alabama	146,677	2,947,952	230,494	1,948,594
Tennessee	121,122	2,572,765	47,327	444,664
New Jersey	93,350	1,827,494	82,674	941,738
Florida	68,902	1,127,428	36,701	307,272
Louisiana	59,856	1,309,030	52,713	469,070
Mississippi	51,159	995,700	62,518	477,818
Illinois	43,003	835,494	(1)	(1)
Indiana	41,467	1,019,089	(1)	(1)
Pennsylvania	12,054	310,611	23,899	242,935
All other states	105,475	1,968,172	59,978	601,042
	State.		State.	
Average unit value, ton	.....	19.90	.....	9.17
Maximum	Pa.	25.77	Ohio	13.87
Minimum	Florida	16.36	Miss.	7.64
Other fertilizers	Tons. 965,290	$34,387,757	Tons. 1,059,495	$15,438,167
North Carolina	124,743	5,595,856	29,241	417,643
Ohio	105,128	2,377,681	50,825	846,851
Maryland	87,716	3,406,432	130,993	1,469,613
Georgia	77,480	3,136,121	134,123	1,883,315
Illinois	76,266	3,059,099	32,961	402,360
Pennsylvania	59,569	1,655,734	80,728	1,235,063
New Jersey	55,799	1,407,897	39,837	615,992
South Carolina	51,015	2,249,809	60,270	1,163,903
Tennessee	46,918	1,332,012	118,021	1,092,603
Alabama	28,472	1,024,952	53,414	923,529
Kentucky	25,726	784,965	52,453	642,580
Mississippi	19,669	793,900	(1)	(1)
Virginia	18,730	612,477	90,304	1,278,431
California	15,403	1,042,519	9,749	312,584
Indiana	14,230	658,348	10,094	186,030
Florida	9,908	217,651	9,142	262,469
Louisiana	8,711	362,453	36,434	668,372
Connecticut	1,732	94,794	9,503	284,888
All other states	138,075	4,575,057	111,403	1,751,965
	State.		State.	
Average unit value, ton	.....	35.62	.....	14.57
Maximum	Calif.	67.68	Calif.	32.06
Minimum	N. Y.	13.24	Tenn.	9.26

[1] Included in "All other states."

GENERAL TABLES.

Table 14 gives for 1919, 1914, and 1909 a comparative summary, by states, for number of establishments, aggregate number of wage earners, primary horsepower, cost of materials, and value of products.

Table 15 presents for 1919 the detailed statistics for the industry for such states as can be shown without disclosing the operations of individual establishments.

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

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	600	26,296	125,939	$25,363	$185,041	$281,144
	1914	784	22,815	114,281	10,532	107,955	153,196
	1909	550	18,310	64,711	7,477	69,522	103,960
Alabama	1919	40	1,136	5,908	1,044	7,576	11,625
	1914	80	1,416	7,112	546	8,077	10,870
	1909	42	1,233	4,484	392	4,264	6,423
California	1919	17	234	2,423	317	2,532	3,610
	1914	16	196	1,586	158	1,860	2,331
	1909	15	226	1,579	155	1,796	2,313
Connecticut	1919	6	188	753	204	2,556	3,599
	1914	10	329	1,689	185	1,477	1,972
	1909	12	295	1,273	137	1,091	1,573
Delaware	1919	7	41	225	28	510	630
	1914	9	64	295	28	382	510
	1909	10	134	805	52	452	860
Florida	1919	24	1,390	4,368	1,103	7,158	10,686
	1914	22	781	3,070	367	4,656	6,995
	1909	12	589	1,710	218	2,875	3,878
Georgia	1919	144	4,152	20,561	3,336	30,767	47,480
	1914	230	3,833	19,097	1,406	21,220	29,046
	1909	110	2,770	10,488	921	10,944	16,800
Illinois	1919	12	953	3,090	755	3,723	6,160
	1914	12	696	3,739	398	2,350	3,775
	1909	11	444	2,145	225	1,425	2,386
Indiana	1919	13	328	2,123	306	2,733	4,713
	1914	14	193	1,293	95	747	1,136
	1909	15	123	1,012	62	254	456
Louisiana	1919	6	584	2,317	452	2,634	4,197
	1914	6	408	1,948	171	1,932	2,818
	1909	6	295	1,178	127	1,324	1,757
Maine	1919	10	174	616	150	3,077	4,055
	1914	8	155	973	68	1,195	1,583
	1909	5	95	323	36	431	597
Maryland	1919	45	3,102	16,400	$3,561	$24,695	$37,014
	1914	48	1,991	7,242	1,052	9,968	13,987
	1909	41	1,439	5,324	617	6,963	9,673
Mississippi	1919	9	370	2,316	285	2,668	3,627
	1914	11	379	2,809	155	1,605	2,060
	1909	10	449	1,823	141	1,385	2,125
New Jersey	1919	19	1,740	6,639	2,093	11,811	15,758
	1914	23	1,530	5,829	814	7,587	11,198
	1909	22	1,208	2,459	541	5,685	7,672
North Carolina	1919	45	2,077	9,592	1,850	18,606	27,551
	1914	41	1,690	8,155	734	7,704	10,308
	1909	34	933	3,132	393	4,183	6,316
Ohio	1919	23	1,197	7,179	1,501	8,071	14,042
	1914	24	1,005	4,739	590	4,627	7,246
	1909	27	841	3,059	368	2,535	4,435
Pennsylvania	1919	31	1,021	5,077	1,150	5,845	8,731
	1914	47	1,110	4,647	608	4,170	6,178
	1909	48	1,224	5,174	575	4,613	6,543
South Carolina	1919	50	2,765	10,197	2,124	19,429	30,412
	1914	55	2,050	7,576	803	10,316	13,825
	1909	26	1,851	4,766	671	5,629	9,025
Tennessee	1919	10	821	3,646	713	4,012	6,842
	1914	15	706	3,752	329	2,592	4,372
	1909	12	559	2,152	204	2,122	3,249
Texas	1919	9	190	1,404	190	1,101	1,503
	1914	8	101	522	63	366	638
	1909	3	9	53	3	49	57
Virginia	1919	43	2,354	13,260	2,456	14,198	22,891
	1914	57	2,470	19,577	1,051	7,996	11,350
	1909	45	1,956	5,560	760	5,389	8,035
All other states	1919	37	1,429	7,845	1,745	11,339	15,928
	1914	48	1,712	8,631	911	7,128	10,998
	1909	44	1,637	6,212	879	6,113	9,787

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

STATE.	Number of establishments	Persons engaged in the industry. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Number, 15th day of— Maximum month.	Number, 15th day of— Minimum month.	Wage earners Dec. 15, or nearest representative day. Total.	16 and over. Male.	16 and over. Female.	Under 16, male.	Capital.	Expenses. Salaries and wages. Officials.	Expenses. Salaries and wages. Clerks, etc.
United States	600	32,522	219	1,914	3,318	775	26,296	Mh 38,357	Je 21,071	30,071	29,565	428	78	$311,633,259	$5,870,938	$5,700,662
Alabama	40	1,402	7	110	120	29	1,136	Mh 2,212	Je 737	1,326	1,306	17	3	12,224,284	267,540	208,769
California	17	469	3	32	129	21	284	No 315	Se 257	299	290	9	.....	3,543,351	95,761	151,369
Connecticut	6	266	4	25	39	10	188	Ap 308	Oc 132	172	172	.....	.....	3,804,994	88,988	69,094
Delaware	7	68	9	12	4	2	41	Mh 60	Ja 18	51	51	.....	.....	452,810	23,585	3,267
Florida	24	1,718	2	99	174	53	1,390	Mh 1,663	Au 1,070	1,578	1,532	45	1	15,938,567	269,376	306,467
Georgia	144	5,342	77	380	633	100	4,152	Mh 8,512	Au 2,535	4,555	4,464	20	71	59,482,762	1,065,761	1,051,854
Illinois	12	1,120	3	39	104	21	953	Se 1,246	De 786	861	861	.....	.....	6,430,846	160,862	172,492
Indiana	13	435	3	32	50	22	328	Se 628	Fe 258	300	296	3	1	3,268,585	116,686	87,647
Kentucky	4	116	2	10	14	9	81	Se 140	Fe 66	69	69	.....	.....	728,757	27,980	26,058
Louisiana	6	677	.....	27	51	15	584	Mh 1,124	Je 299	749	657	92	.....	4,215,019	80,670	84,406
Maine	10	243	7	18	28	16	174	Ja 261	No 121	170	167	3	.....	3,347,807	49,134	48,851
Maryland	45	3,865	26	217	392	128	3,102	Mh 3,701	No 2,668	3,119	3,087	32	.....	35,236,201	784,276	670,652
Mississippi	9	431	.....	31	25	5	370	Mh 592	Je 241	346	346	.....	.....	4,738,555	86,880	36,568
New Jersey	19	2,076	6	88	205	37	1,740	Mh 2,222	Au 1,465	1,663	1,644	19	.....	20,052,967	255,244	287,894
North Carolina	45	2,509	12	139	234	47	2,077	Ap 3,487	Je 1,418	3,468	3,457	11	.....	29,963,822	499,044	421,621
Ohio	23	1,539	1	99	190	52	1,197	Se 2,185	Se 870	1,312	1,302	10	.....	11,649,854	299,365	318,067
Oregon	3	9	1	2	.....	.....	6	Ap 7	Au 5	7	7	.....	.....	10,950	1,800	.....
Pennsylvania	31	1,315	26	82	137	49	1,021	Ja 1,359	Je 777	901	894	7	.....	8,657,049	253,448	250,481
South Carolina	50	3,279	5	198	267	44	2,765	Mh 4,763	Oc 1,787	3,587	3,567	20	.....	33,221,052	573,187	502,917
Tennessee	10	957	2	33	86	15	821	Ap 1,334	Je 512	625	621	4	.....	9,189,393	104,789	162,554
Texas	9	222	3	21	6	2	190	Jy 277	Se 119	351	351	.....	.....	963,528	41,735	7,849
Virginia	43	2,768	7	140	219	48	2,354	Ap 3,029	De 1,841	3,279	3,221	58	.....	25,710,704	480,229	455,051
All other states [1]	30	1,696	13	80	211	50	1,342	.....	.....	1,283	1,203	78	2	18,801,402	244,589	376,734

STATE.	Expenses—continued. Salaries and wages—Con. Wage earners.	For contract work.	Rent and taxes. Rent of factory.	Rent and taxes. Taxes, Federal, state, county, and local.	For materials. Principal materials.	For materials. Fuel and rent of power	Value of products.	Value added by manufacture.	Power. Primary horsepower. Total.	Owned. Steam engines (not turbines).	Owned. Steam turbines.	Owned. Internal-combustion engines.	Owned. Water power.[2]	Rented.[3]	Electric horsepower generated in establishments reporting.
United States	$25,363,132	$171,318	$345,582	$8,129,732	$181,599,677	$3,440,845	$281,143,587	$96,103,065	125,939	39,274	1,208	4,862	709	79,886	13,225
Alabama	1,043,507	822	614	366,852	7,427,033	149,377	11,624,913	4,048,503	5,908	2,499	.....	158	.....	3,251	40
California	317,350	11,899	27,385	41,233	2,482,550	49,731	3,609,704	1,077,423	2,423	285	.....	20	.....	2,118	.....
Connecticut	203,521	.....	.....	73,183	2,537,882	18,516	3,598,886	1,042,488	753	215	.....	.....	.....	538	.....
Delaware	28,233	.....	231	1,643	506,692	3,371	630,405	120,342	225	145	.....	10	.....	70	.....
Florida	1,102,556	.....	2,922	182,259	7,005,422	152,483	10,685,819	3,527,914	4,368	2,130	.....	812	.....	1,426	1,258
Georgia	3,336,110	72,208	36,567	1,552,768	30,448,840	317,810	47,479,842	16,713,192	20,561	2,701	.....	961	.....	16,899	198
Illinois	754,809	60	82,514	73,501	3,582,444	140,242	6,159,817	2,437,131	3,090	580	175	.....	.....	2,335	.....
Indiana	308,255	.....	967	111,855	2,698,871	34,890	4,713,067	1,979,606	2,123	440	.....	56	.....	1,627	.....
Kentucky	67,237	941	2,062	16,967	728,867	6,504	999,946	264,515	370	157	.....	.....	.....	213	.....
Louisiana	451,672	.....	.....	104,199	2,572,364	61,972	4,197,285	1,562,949	2,317	455	.....	.....	.....	1,862	44
Maine	150,405	500	2,421	36,368	3,068,019	8,957	4,054,698	977,722	616	70	.....	5	.....	541	.....
Maryland	3,561,181	2,994	42,600	781,275	24,271,436	423,282	37,014,097	12,319,379	16,400	2,257	733	112	.....	13,298	1,382
Mississippi	284,818	.....	4,800	159,357	2,612,394	55,654	3,626,674	958,626	2,316	588	.....	.....	.....	1,728	47
New Jersey	2,092,764	2,000	3,103	277,276	11,487,483	323,553	15,758,105	3,947,069	6,639	4,450	.....	395	.....	1,794	5,684
North Carolina	1,850,365	2,635	43,459	961,205	18,331,083	274,737	27,551,316	8,945,496	9,592	3,060	150	962	.....	5,420	877
Ohio	1,500,901	6,910	7,859	486,137	7,909,525	161,718	14,042,055	5,970,812	7,179	3,399	.....	132	386	3,262	747
Oregon	7,192	.....	300	16	13,551	865	31,170	16,754	58	40	.....	3	.....	15	.....
Pennsylvania	1,149,672	7,079	14,561	121,587	5,577,840	267,207	8,731,281	2,886,234	5,077	2,464	150	48	73	2,342	1,462
South Carolina	2,124,157	191	19,294	1,209,272	19,179,399	249,669	30,411,575	10,982,507	10,197	1,990	.....	163	.....	8,044	10
Tennessee	712,941	.....	700	187,212	3,875,261	136,296	6,841,797	2,830,240	3,646	1,320	.....	.....	.....	2,326	18
Texas	189,676	1,205	10,749	6,242	1,070,001	30,775	1,592,718	491,942	1,404	405	.....	.....	.....	999	.....
Virginia	2,456,294	42,292	5,064	1,089,945	13,915,308	282,886	22,891,353	8,693,159	13,260	7,576	.....	765	.....	4,919	458
All other states [1]	1,671,516	19,582	37,405	289,380	10,297,712	290,290	14,897,064	4,309,062	7,417	2,048	.....	260	250	4,859	1,000

[1] Includes Arkansas, 2 establishments; Colorado, 2; Iowa, 1; Kansas, 4; Massachusetts, 2; Michigan, 1; Missouri, 3; Montana, 1; Nebraska, 1; Nevada, 1; New Mexico, 1; New York, 6; Rhode Island, 1; Washington, 3; West Virginia, 1.

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

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

MANUFACTURED GAS.

GENERAL STATISTICS.

General character of the industry.—The census report on the gas industry covers establishments, both private and municipal, engaged in the commercial manufacture of gas delivered through mains, for illuminating, household, and industrial purposes, together with Pintsch gas, which is used principally for lighting railway cars and is delivered direct from the plant to pressure containers on the cars. In accordance with the above definition the production of gas for the exclusive use of the establishment producing it is not included, and the report does not cover blast-furnace gas nor that of by-product coke ovens. A considerable amount of the latter, however, is purchased by commercial gas plants and used as an ingredient in manufactured gas. The statistics for acetylene sold in containers by establishments having no distributing mains, formerly included in the report on manufactured gas, will be found in the section of the report on the chemical industry, pertaining to compressed and liquefied gases. Nonmanufacturing establishments which buy gas for distribution to consumers without change or treatment are omitted as engaged in mercantile operations only.

The products of the gas industry include not only the various kinds of gas—coal gas, carbureted water gas, mixed coal and water gas, oil gas, acetylene, gasoline (cold-process) gas, and enriched natural gas—but their by-products, such as coke, tar, ammonia, naphthalene, and light oil and derivatives, benzol, toluol, solvent naphtha, etc. Very few gas plants carry their operations as far as the segregation of the tar and oil derivatives.

A product now shown for the first time is enriched natural gas, or natural gas mixed with a certain proportion of manufactured gas. No plant reported at this census the production for sale of straight water gas or "blue gas."

Statistics for the industry were presented at the census of 1849 and at each subsequent census except that of 1879. A brief historical sketch of the industry is contained in the report for the census of 1889.

Comparative summary.—Table 1 summarizes the statistics of the industry for each census from 1889 to 1919, inclusive, and shows percentages of increase for each five-year period.

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.

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." Figures for states will be found in Table 31.

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 constitute but six-tenths of 1 per cent of the total number, and were reported in relatively few cases.

Prevailing hours of labor.—Table 5 shows a marked shortening of the working day since 1909. In that year 88.6 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were 60 and over, and 73 per cent where they were "Over 60." The movement toward shortening the hours of labor reduced these percentages in 1914 to 52.5 and 31.4 per cent, respectively, and in 1919 to 25.4 per cent for establishments working 60 hours per week and over and to 13.4 per cent for over 60 per week. On the other hand, the hour groups of 48 per week and less constituted but 1.3 per cent of the total number in 1909, 6.7 per cent in 1914, and 35.9 per cent in 1919. The change is notably marked in Maryland, Michigan, New Jersey, and New York.

Size of establishments, by average number of wage earners.—Analysis of Table 6 discloses the fact that in 1919 the average number of wage earners for all plants was 42 as compared with 34 in 1914.

Size of establishments, by value of products.—Table 7 shows that, measured by value of products, the growth has been in the higher groups; those with products "Less than $5,000" and "$5,000 to $20,000," showing progressively for each census fewer in number of establishments, wage earners, and value of products. The average value of products per establishment was $129,000 in 1909, $172,000 in 1914, and $322,000 in 1919, though the increase in average value added by manufacture was relatively much less—$88,000 in 1909, $112,000 in 1914, and $168,000 in 1919.

Character of ownership.—Table 8 presents the statistics bearing upon the character of ownership, or legal organization, of the establishments in the industry; municipally owned establishments, 57 in number in 1919 and 138 in 1914, are a factor. The statistics for the municipal plants will be found in Table 29.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power. Of the total primary power, 23.2 per cent was utilized in the form of electric power purchased or generated by the establishments reporting, in 1919; 15.8 per cent in 1914; and 13.5 per cent in 1909.

Fuel consumed.—Table 10 presents the statistics for fuel, by kinds and by states, for 1919 and 1914. The statistics include fuel for all purposes, both as material for gas making and for boilers and retorts. The figures for the fuel used as materials in gas making are shown in Table 12, and by states in Table 15 These relate to the purchased fuel and do not include products of the plants that are made and consumed. The figures for gas include both natural and manufactured gas (purchased), chiefly natural gas.

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

	1919	1914	1909	1904	1899	1889	PER CENT OF INCREASE.[1]				
							1914–1919	1909–1914	1904–1909	1899–1904	1889–1899
Number of establishments	1,022	1,284	1,296	1,019	877	742	−20.4	−0.9	27.2	16.2	18.2
Persons engaged	63,328	63,993	51,007	40,043	28,363	(2)	−1.0	25.5	27.4	41.2	.....
Proprietors and firm members	27	78	277	71	(2)	(2)	.....	−71.8	290.1	.....	.....
Salaried employees	20,393	20,123	13,515	9,406	5,904	(2)	1.3	48.9	43.7	59.3	.....
Wage earners (average number)	42,908	43,792	37,215	30,566	22,459	12,996	−2.0	17.7	21.8	36.1	72.8
Primary horsepower	238,467	215,715	128,350	73,101	31,797	26,475	10.5	68.1	75.6	129.9	20.1
Capital	$1,465,656,265	$1,252,421,584	$915,536,762	$725,035,204	$567,000,506	$258,771,795	17.0	36.8	26.3	27.9	119.1
Salaries and wages	$77,931,081	$44,330,684	$33,316,068	$25,521,616	$17,709,796	(2)	75.8	33.1	30.5	44.1	.....
Salaries	$25,172,453	$17,529,020	$12,385,871	$8,463,699	$5,273,500	(2)	43.6	41.5	46.3	60.5	.....
Wages	$52,758,628	$26,801,664	$20,930,697	$17,057,917	$12,436,296	$8,499,625	96.8	28.0	22.7	37.2	46.3
Paid for contract work	$463,280	$551,760	$114,570	$288,452	(2)	(2)	−16.0	381.5	−60.3	.....	.....
Rent and taxes	$22,889,015	$13,388,969	$7,836,275	[3] $6,250,790	(2)	(2)	71.0	70.8	25.4	.....	.....
Cost of materials	$157,550,882	$76,779,288	$52,427,844	$41,193,951	$20,605,356	$14,037,087	105.2	46.4	27.3	99.9	46.8
Value of products	$329,278,908	$220,237,790	$166,814,371	$125,144,945	$75,716,693	$56,987,290	49.5	32.0	33.3	65.3	32.9
Value added by manufacture [4]	$171,728,026	$143,458,502	$114,386,527	$83,950,994	$55,111,337	$42,950,203	19.7	25.4	36.3	52.3	28.3
Gas production—1,000 cubic feet	344,119,811	203,639,260	150,835,793	112,549,979	67,093,553	36,519,512	69.0	35.0	34.0	67 7	83.7

[1] A minus sign (−) denotes decrease. [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	1,022	42,908	100.0	....	$329,279	100.0	....	$171,728	100.0	...
New York	96	8,409	19.6	1	69,339	21.1	1	28,169	16.4	1
Illinois	70	4,430	10.3	2	36,930	11.2	2	19,038	11.1	2
Pennsylvania	86	3,324	7.7	3	31,598	9.6	3	14,268	8.3	3
Massachusetts	51	2,654	6.2	5	24,231	7.4	4	13,458	7.8	4
California	57	2,444	5.7	6	20,441	6.2	5	12,441	7.2	6
New Jersey	38	2,083	4.9	7	20,317	6.2	6	12,943	7.5	5
Michigan	59	2,846	6.6	4	17,993	5.5	7	9,723	5.7	7
Indiana	53	1,902	4.4	8	12,454	3.8	8	5,843	3.4	9
Missouri	26	1,318	3.1	9	11,113	3.4	9	8,117	4.7	8
Connecticut	22	1,270	3.0	11	8,347	2.5	10	5,157	3.0	10
Wisconsin	34	1,294	3.0	10	8,153	2.5	11	4,578	2.7	11
Maryland	16	875	2.0	12	6,448	2.0	12	3,590	2.1	12
Iowa	68	727	1.7	13	5,738	1.7	13	3,096	1.8	14
Minnesota	23	707	1.6	14	5,518	1.7	14	3,110	1.8	13
Rhode Island	4	670	1.6	15	4,478	1.4	15	2,405	1.4	15
Washington	12	637	1.5	17	3,680	1.1	17	2,074	1.2	17
Texas	25	643	1.5	16	3,614	1.1	18	2,027	1.2	18
Virginia	17	475	1.1	20	3,150	1.0	19	1,693	1.0	19
Georgia	17	486	1.1	19	3,005	0.9	20	1,486	0.9	21
Oregon	11	334	0.8	25	2,927	0.9	21	2,109	1.2	16
Colorado	10	448	1.0	22	2,649	0.8	22	1,648	1.0	20
Louisiana	4	250	0.6	27	$2,636	0.8	23	$1,467	0.9	22
Nebraska	20	291	0.7	26	2,446	0.7	24	1,311	0.8	23
Florida	14	418	1.0	23	1,989	0.6	25	1,006	0.6	24
Tennessee	10	474	1.1	21	1,801	0.5	26	960	0.6	25
Alabama	12	522	1.2	18	1,646	0.5	27	884	0.5	26
North Carolina	22	341	0.8	24	1,521	0.5	28	844	0.5	27
Maine	13	220	0.5	28	1,381	0.4	29	734	0.4	28
New Hampshire	13	209	0.5	30	1,195	0.4	30	666	0.4	29
Delaware	7	145	0.3	33	1,053	0.3	31	604	0.3	30
South Carolina	10	219	0.5	29	947	0.3	32	472	0.3	33
Ohio	15	162	0.4	32	887	0.3	33	530	0.3	31
Utah	4	172	0.4	31	790	0.2	34	495	0.3	32
Arizona	9	63	0.1	38	691	0.2	35	341	0.2	34
South Dakota	12	80	0.2	37	613	0.2	36	294	0.2	35
Montana	6	63	0.1	38	487	0.1	37	290	0.2	36
Vermont	9	87	0.2	36	486	0.1	38	264	0.2	37
Mississippi	7	122	0.3	34	411	0.1	39	207	0.1	40
Kansas	7	52	0.1	39	400	0.1	40	245	0.1	38
North Dakota	5	43	0.1	40	384	0.1	41	229	0.1	39
Kentucky	10	90	0.2	35	340	0.1	42	180	0.1	41
Idaho	4	35	0.1	41	241	0.1	43	150	0.1	42
West Virginia	3	29	0.1	42	96	(1)	46	44	(1)	43
All other states [2]	11	845	2.0	....	4,715	1.4	....	2,538	1.5	...

[1] Less than one-tenth of 1 per cent. [2] Includes District of Columbia, rank 16, according to value of products.

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	63,328	57,164	6,164	90.4	9.6
	1914	63,993	61,156	2,837	95.6	4.4
	1909	51,007	49,231	1,776	96.5	3.5
Proprietors and officials	1919	3,451	3,417	34	99.0	1.0
	1914	2,987	2,968	19	99.4	0.6
	1909	2,986	2,967	19	99.4	0.6
Proprietors and firm members	1919	27	27	.....	100.0	.....
	1914	78	76	2	97.4	2.6
	1909	277	273	4	98.6	1.4
Salaried officers of corporations	1919	901	882	19	97.9	2.1
	1914	954	941	13	98.6	1.4
	1909	990	981	9	99.1	0.9
Superintendents and managers	1919	2,523	2,508	15	99.4	0.6
	1914	1,955	1,951	4	99.8	0.2
	1909	1,719	1,713	6	99.7	0.3
Clerks and other subordinate salaried employees.	1919	16,969	11,088	5,881	65.3	34.7
	1914	17,214	14,593	2,621	84.8	15.2
	1909	10,806	9,121	1,685	84.4	15.6
Wage earners (average number)	1919	42,908	42,659	249	99.4	0.6
	1914	43,792	43,595	197	99.6	0.4
	1909	37,215	37,143	72	99.8	0.2
16 years of age and over	1919	42,887	42,638	249	99.4	0.6
	1914	43,764	43,567	197	99.5	0.5
	1909	37,198	37,127	71	99.8	0.2
Under 16 years of age	1919	21	21	.....	100.0	.....
	1914	28	28	.....	100.0	.....
	1909	17	16	1	94.1	5.9

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

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

STATE.	Average number employed during year.	NUMBER EMPLOYED ON 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	42,908	43,793	42,220	*41,549*	41,750	42,122	42,338	43,237	43,231	42,554	43,754	44,068	**44,280**	93.8
Males	42,659	43,483	41,932	*41,293*	41,491	41,879	42,114	42,967	42,972	42,298	43,543	43,860	**44,076**	93.7
Females	249	310	288	256	259	243	224	270	259	256	211	208	*204*	65.8
1914	43,792	41,603	41,017	41,488	44,276	47,204	**47,572**	46,962	45,772	44,213	42,999	41,404	*40,994*	86.2
1909	37,215	33,115	*32,562*	34,314	37,422	39,456	**40,412**	40,225	38,486	37,800	38,065	37,566	37,122	80.6
Alabama	522	507	524	526	520	*496*	497	550	528	519	518	521	558	88.9
California	2,444	2,208	*2,079*	2,140	2,336	2,378	2,452	2,508	2,490	2,436	2,714	**2,851**	2,736	72.9
Connecticut	1,270	1,269	1,256	1,257	1,244	1,278	1,300	1,289	1,331	1,289	1,249	*1,229*	1,249	92.3
Illinois	4,430	**4,986**	4,558	4,414	4,268	4,382	4,262	4,341	4,432	*4,258*	4,391	4,395	4,473	85.6
Indiana	1,902	1,945	1,925	1,882	1,816	*1,786*	1,841	1,935	**1,987**	1,965	1,938	1,966	1,838	89.9
Iowa	727	727	*696*	714	732	729	711	718	728	748	730	741	750	92.8
Maryland	875	803	749	*738*	767	747	854	967	988	977	988	962	960	74.7
Massachusetts	2,654	2,739	2,729	2,680	2,686	2,726	2,687	2,696	2,656	*2,424*	2,606	2,581	2,638	88.5
Michigan	2,846	2,557	*2,387*	2,478	2,569	2,679	2,754	3,032	2,984	3,018	3,274	3,145	**3,275**	72.9
Minnesota	707	661	*652*	639	699	751	**783**	701	681	706	744	751	736	80.7
Missouri	1,318	1,419	1,373	1,305	1,291	1,289	*1,265*	1,280	1,287	1,289	1,320	1,333	1,365	89.1
New Jersey	2,083	2,303	2,176	2,012	*1,924*	2,057	2,077	2,188	2,062	2,029	2,029	2,067	2,072	83.5
New York	8,409	8,636	8,351	8,336	8,389	8,514	8,425	8,500	8,420	*8,076*	8,238	8,583	8,440	93.5
Pennsylvania	3,324	3,532	3,518	3,405	3,363	3,262	3,256	3,265	*3,223*	3,275	3,308	3,224	3,257	91.3
Rhode Island	670	1,001	948	844	766	624	558	545	*508*	542	555	563	586	50.7
Texas	643	640	637	621	633	603	*597*	622	625	668	692	685	693	86.1
Washington	637	558	*553*	539	566	578	591	629	646	731	**772**	742	759	69.0
Wisconsin	1,294	1,228	*1,174*	1,207	1,310	1,341	1,341	**1,351**	1,343	1,313	1,320	1,286	1,314	86.9

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

INDUSTRY AND CITY.	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	42,908	55	59	15,309	555	2,788	13,254	5,119	5,769
	1914	43,792	(2)	(2)	2,914	133	9,213	8,548	9,248	13,736
	1909	37,215	(2)	(2)	474	21	1,049	2,716	5,806	27,149
Alabama [3]	1919	522	.....	.....	93	.....	.....	28	235	166
California	1919	2,444	17	.....	2,298	6	13	80	.....	30
	1914	2,317	(2)	(2)	1,530	3	397	34	42	311
Connecticut	1919	1,270	.....	.....	60	31	286	223	409	261
	1914	1,209	(2)	(2)	94	.....	50	53	214	798
Illinois	1919	4,430	4	.....	619	6	75	3,032	252	442
	1914	3,890	(2)	(2)	15	.....	100	2,801	125	849
Indiana	1919	1,902	6	.....	7	.....	13	828	79	969
	1914	1,668	(2)	(2)	12	.....	53	636	503	464
Iowa	1919	727	3	.....	68	7	173	162	46	268
	1914	768	(2)	(2)	27	.....	14	126	322	279
Maryland	1919	875	2	.....	803	.....	.....	8	16	46
	1914	1,234	(2)	(2)	3	.....	.....	1,124	46	61
Massachusetts	1919	2,654	1	.....	633	42	16	1,954	.....	8
	1914	3,182	(2)	(2)	329	.....	22	749	437	1,645
Michigan	1919	2,846	.....	3	1,203	5	6	667	852	110
	1914	2,349	.....	.....	.....	.....	109	967	270	1,003
Minnesota	1919	707	6	22	5	1	8	631	6	28
	1914	1,038	(2)	(2)	13	.....	18	633	43	331
Missouri	1919	1,318	.....	.....	69	.....	7	116	18	1,108
	1914	1,342	(2)	(2)	19	.....	11	6	1,126	180
New Jersey	1919	2,083	5	.....	1,418	43	140	255	23	199
	1914	2,205	(2)	(2)	7	3	102	46	233	1,814
New York	1919	8,409	8	.....	6,919	68	462	537	306	109
	1914	10,090	(2)	(2)	267	3	7,527	305	866	1,122
Pennsylvania	1919	3,324	3	.....	63	36	175	669	2,203	175
	1914	2,796	(2)	(2)	6	6	114	41	2,170	459
Rhode Island	1919	670	.....	.....	.....	7	504	159	.....	.....
	1914	605	(2)	(2)	64	.....	.....	47	492	2
Texas	1919	643	.....	.....	252	28	.....	38	35	290
	1914	613	(2)	(2)	6	.....	141	7	89	370
Washington	1919	637	.....	.....	156	.....	.....	425	.....	56
	1914	630	(2)	(2)	63	76	18	84	383	6
Wisconsin	1919	1,294	.....	34	47	.....	612	449	76	76
	1914	1,240	(2)	(2)	38	.....	27	44	350	781

[1] Includes 48 and under for 1914 and 1909. [2] Corresponding figures not available. [3] Included with "All other states," in 1914.

TABLE 6.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED 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.	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	1,022	42,908	15	392	1,156	325	3,690	151	4,918	53	3,806	54	8,011	20	7,000	6	4,241	6	10,086
1914	1,284	43,792	50	620	1,529	341	3,803	127	4,155	69	4,857	44	7,258	18	6,109	9	5,897	6	10,184
Alabama	12	522	.....	5	24	3	32	1	23	1	87	2	356	.....	.....	.....	.....	.....	.....
California	57	2,444	.....	22	74	19	243	5	149	5	335	3	515	3	1,128	.....	.....	.....	.....
Connecticut	22	1,270	.....	1	2	9	100	5	182	3	209	3	397	1	380	.....	.....	.....	.....
Illinois	70	4,430	2	25	75	18	215	16	515	2	155	6	720	.....	.....	.....	.....	1	2,750
Indiana	53	1,902	2	21	53	9	102	14	427	3	212	3	348	.....	.....	1	760	.....	.....
Iowa	68	727	1	47	119	9	117	8	229	2	139	1	123	.....	.....	.....	.....	.....	.....
Maryland	16	875	.....	10	28	4	46	1	25	.....	.....	.....	.....	.....	.....	1	776	.....	.....
Massachusetts	51	2,654	1	10	27	16	203	11	387	4	277	6	875	3	885	.....	.....	.....	.....
Michigan	59	2,846	.....	15	59	26	278	7	220	5	352	5	748	.....	.....	.....	.....	1	1,189
Minnesota	23	707	.....	14	34	7	95	.....	.....	.....	.....	1	158	1	420	.....	.....	.....	.....
Missouri	26	1,318	1	12	38	9	94	1	25	2	147	.....	.....	.....	.....	.....	.....	1	1,014
New Jersey	38	2,083	1	12	26	11	124	5	169	3	211	3	385	3	1,168	.....	.....	.....	.....
New York	96	8,409	4	29	77	28	327	14	515	6	412	9	1,434	3	1,074	1	840	2	3,730
Pennsylvania	86	3,324	1	43	117	25	308	9	314	4	307	1	136	2	739	.....	.....	1	1,403
Rhode Island	4	670	.....	.....	.....	.....	7	1	37	.....	.....	1	122	.....	.....	1	504	.....	.....
Texas	25	643	.....	11	40	7	66	4	118	2	194	1	225	.....	.....	.....	.....	.....	.....
Washington	12	637	.....	3	4	2	22	4	99	2	152	.....	.....	1	360	.....	.....	.....	.....
Wisconsin	34	1,294	.....	12	36	12	145	8	299	.....	.....	1	204	.....	.....	1	610	.....	.....

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

VALUE OF PRODUCT.	NUMBER OF ESTABLISHMENTS.			AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.			VALUE ADDED BY MANUFACTURE.		
	1919	1914	1909	1919	1914	1909	1919	1914	1909	1919	1914	1909
All classes	1,022	1,284	1,296	42,908	43,792	37,215	$329,278,908	$220,237,790	$166,814,371	$171,728,026	$143,453,502	$114,386,527
Less than $5,000	74	285	356	64	271	297	160,543	582,774	764,347	37,958	229,051	324,348
$5,000 to $20,000	180	320	371	532	1,151	1,364	2,389,388	3,817,647	4,445,249	1,122,025	2,228,239	2,732,484
$20,000 to $100,000	455	436	369	4,160	5,145	4,930	21,489,375	20,032,768	16,863,851	11,506,282	12,850,279	10,933,845
$100,000 to $500,000	208	177	172	7,732	14,468	13,274	46,808,456	42,568,602	48,345,467	26,240,590	40,117,718	33,709,342
$500,000 to $1,000,000	48	27		5,122			35,035,040	17,842,850		19,238,041		
$1,000,000 and over	57	39	28	25,298	22,757	17,350	223,396,106	135,393,149	96,395,457	113,583,130	88,033,215	66,686,508
	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	7.2	22.2	27.5	0.1	0.6	0.8	(1)	0.3	0.5	(1)	0.2	0.3
$5,000 to $20,000	17.6	24.9	28.6	1.2	2.6	3.7	0.7	1.7	2.7	0.7	1.5	2.4
$20,000 to $100,000	44.5	34.0	28.5	9.7	11.8	13.2	6.5	9.1	10.1	6.7	9.0	9.5
$100,000 to $500,000	20.4	13.8	13.3	18.0	33.0	35.7	14.2	19.3	29.0	15.3	28.0	29.5
$500,000 to $1,000,000	4.7	2.1		11.9			10.6	8.1		11.2		
$1,000,000 and over	5.6	3.0	2.2	59.0	52.0	46.6	67.9	61.5	57.8	66.1	61.3	58.3

[1] Less than one-tenth of 1 per cent.

TABLE 8.—CHARACTER OF OWNERSHIP: 1919, 1914, AND 1909.

CHARACTER OF OWNERSHIP.	NUMBER OF ESTABLISHMENTS.			VALUE OF PRODUCTS.			CHARACTER OF OWNERSHIP.	NUMBER OF ESTABLISHMENTS.			VALUE OF PRODUCTS.		
	1919	1914	1909	1919	1914	1909		1919	1914	1909	1919	1914	1909
Total	1,022	1,284	1,296	$329,278,908	$220,237,790	$166,814,371	Per cent of total.	100.0	100.0	100.0	100.0	100.0	100.0
Individual	[1] 13	34	48	1,349,820	99,016	114,851	Individual	1.3	2.6	3.7	0.4	(3)	0.1
Corporation	951	1,101	1,091	325,164,125	218,306,024	165,108,539	Corporation	93.0	85.8	84.2	98.8	99.1	99.0
All other	[2] 58	149	157	2,764,963	1,832,750	1,590,981	All other	5.7	11.6	12.1	0.8	0.8	1.0

[1] Distributed by states as follows: New York, 3 establishments; and 1 each in California, Delaware, Georgia, Indiana, Iowa, Missouri, Nebraska, Oklahoma, South Dakota, and Wisconsin.
[2] Distributed by states as follows: Iowa, 7 establishments; Minnesota, 7; Virginia, 5; Georgia, 4; Michigan, 4; Maryland, 3; North Carolina, 3; South Dakota, 3; 2 each in Florida, Massachusetts, Nebraska, New York, Ohio, and Pennsylvania; and 1 each in Alabama, Arizona, California, Connecticut, Illinois, Kentucky, Maine, New Jersey, North Dakota, and Wisconsin.
[3] Less than one-tenth of 1 per cent.

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	5,095	4,975	3,521	238,467	213,370	128,350	100.0	100.0	100.0
Owned	3,682	3,634	3,285	205,091	194,032	125,456	86.0	91.0	97.7
Steam [1]	3,518	3,352	2,969	197,321	179,878	115,514	82.7	84.4	95.6
Engines	2,868	(2)	(2)	148,393	(2)	(2)	62.2	.....	.....
Turbines	650	(2)	(2)	48,928	(2)	(2)	20.5	.....	.....
Internal-combustion engines	151	268	281	7,574	13,729	7,128	3.2	6.4	5.6
Water wheels, turbines, and motors	13	14	35	196	425	2,814	0.1	0.2	2.1
Rented	1,413	1,341	236	33,376	19,338	2,894	14.0	9.0	2.3
Electric	1,413	1,341	236	33,363	19,271	2,723	14.0	9.0	2.1
Other	.....	.....	.....	13	67	171	(3)	(3)	0.1
Electric	3,235	2,349	935	55,403	37,881	17,336	100.0	100.0	100.0
Rented	1,413	1,341	236	33,363	19,271	2,723	60.2	49.6	15.7
Generated by establishments reporting	1,822	1,008	699	22,040	18,610	14,613	39.8	50.4	84.3

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

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

STATE.	Census year.	COAL. Anthracite [1] (tons, 2,240 pounds).	COAL. Bituminous (tons, 2,000 pounds).	Coke (tons, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
United States	1919	1,388,467	7,383,687	1,497,435	19,069,171	126,629	641,288
	1914	947,261	6,078,299	1,084,217	13,482,655	(2)	2,710,576
Alabama [3]	1919	.....	82,699	.....	50,467	.....	.....
Arizona [3]	1919	.....	.....	550	87,244	.....	.....
California	1919	223	2,851	.....	3,004,166	17,756	304,868
	1914	41	255	.....	2,667,663	(2)	1,886,765
Colorado [3]	1919	.....	138,045	3,054	42,347	.....	.....
Connecticut	1919	40,870	224,434	47,148	483,278	127	969
	1914	47,342	128,693	5,273	213,866	(2)	6,461
Delaware [3]	1919	15,173	6,301	.....	77,004	1	.....
Florida [3]	1919	3,360	38,473	19,198	48,867	8,607	.....
Georgia	1919	.....	103,074	9,339	101,095	11,512	50
	1914	24	81,131	6,300	66,341	(2)	.....
Idaho [3]	1919	.....	9,544	1,288	1,644	.....	.....
Illinois	1919	77,309	619,318	487,850	2,147,811	196	4,748
	1914	8,601	445,792	355,214	1,939,987	(2)	12,167
Indiana	1919	2,697	830,850	48,769	182,348	240	234,574
	1914	132	657,483	22,903	152,170	(2)	.....
Iowa	1919	3,403	82,823	81,222	398,128	5,684	.....
	1914	894	108,992	35,229	172,719	(2)	2,705
Kansas [3]	1919	.....	8,713	643	12,405	5	.....
Kentucky [3]	1919	.....	15,543	1,110	5,634	.....	.....
Louisiana [3]	1919	.....	24,488	32,817	143,407	.....	.....
Maine [3]	1919	3,891	48,341	11,628	15,142	.....	.....
Maryland	1919	4,218	52,898	.....	16,084	.....	.....
	1914	63,069	27,414	895	280,911	(2)	.....
Massachusetts	1919	116,577	572,102	119,862	1,785,175	17,762	.....
	1914	16,801	546,118	81,595	557,485	(2)	450
Michigan	1919	45	834,391	3,832	411,562	.....	598
	1914	407	622,240	9,851	116,564	(2)	.....
Minnesota	1919	.....	116,968	16,550	204,251	1,162	.....
	1914	90	130,552	26,564	267,451	(2)	5,018
Mississippi [3]	1919	.....	23,466	1,194	3,301	.....	.....
Missouri	1919	.....	702,610	24,807	194,082	.....	.....
	1914	208	330,095	92,826	286,489	(2)	40,494
Montana [3]	1919	.....	17,072	1,730	7,984	.....	.....
Nebraska [3]	1919	.....	17,423	28,496	130,201	2,400	19,000
New Hamsphire [3]	1919	4,658	19,306	8,825	22,530	23,401	96
New Jersey	1919	151,379	100,905	107,560	1,023,324	5,554	.....
	1914	159,480	115,988	27,543	876,820	(2)	.....
New York	1919	713,681	1,012,831	142,888	5,101,564	4,353	.....
	1914	481,047	1,145,803	112,988	3,987,246	(2)	.....
North Carolina [3]	1919	.....	59,303	4,011	24,733	.....	.....
North Dakota [3]	1919	.....	15,839	625	1,620	.....	.....
Ohio [3]	1919	1,610	43,067	2,692	12,754	96	18,680
Oregon [3]	1919	.....	4,492	785	585,235	.....	.....
Pennsylvania	1919	148,083	523,280	180,280	1,537,456	17,824	27,825
	1914	87,443	412,849	115,817	287,712	(2)	51,117
Rhode Island	1919	15,604	179,406	4,682	113,823	7,237	.....
	1914	11,646	109,341	.....	110,873	(2)	.....
South Carolina [3]	1919	550	19,064	9,505	24,110	.....	.....
South Dakota [3]	1919	.....	8,635	7,852	54,548	149	.....
Tennessee	1919	.....	99,406	239	57,124	.....	.....
	1914	.....	63,275	13,386	45,767	(2)	790
Texas	1919	2,864	25,606	42,728	213,413	.....	29,880
	1914	2,021	15,983	21,136	142,051	(2)	170,912
Utah [3]	1919	.....	35,812	2,023	12,352	.....	.....
Vermont [3]	1919	4,555	7,930	365	16,971	.....	.....
Virginia	1919	264	116,855	19,309	143,931	.....	.....
	1914	417	147,841	1,629	82,432	(2)	.....
Washington	1919	.....	163,504	2,162	111,132	.....	.....
	1914	28	116,493	14,563	74,633	(2)	.....
West Virginia [3]	1919	822	3,685	.....	.....	2,471	.....
Wisconsin	1919	.....	343,322	17,920	96,397	92	.....
	1914	425	242,174	12,870	41,559	(2)	.....
All other states	1919	76,541	29,012	1,897	362,341	.....	.....
	1914	67,145	629,787	127,635	1,105,916	(2)	533,697

[1] Includes some semianthracite.

[2] Included in figures for fuel oils.

[3] Included with "All other states" in 1914.

SPECIAL STATISTICS.

Establishments, by kind of gas manufactured.—The number of gas-manufacturing establishments in operation in the United States in 1919 and 1914 is shown in Table 11, classified according to kind of gas produced.

TABLE 11.—NUMBER OF ESTABLISHMENTS, BY KIND OF GAS, BY GEOGRAPHIC DIVISIONS AND STATES: 1919 AND 1914.

DIVISION AND STATE.	Census year.	Number of establishments.	CLASSIFIED BY KIND OF GAS. Carbureted water gas.	Coal gas.	Mixed coal and water gas.	Oil gas.	Acetylene.	Gasoline (cold-process) gas.	Other gas (enriched natural).
UNITED STATES	1919	[1] 1,022	401	233	190	[2] 137	[3] 37	22	7
	1914	1,284	430	277	147	[4] 153	[5] 165	112	....
GEOGRAPHIC DIVISIONS:									
New England	1919	112	50	18	34	7	2	1	....
	1914	134	47	22	36	8	18	3	....
Middle Atlantic	1919	220	129	28	28	13	17	5	....
	1914	273	145	40	21	18	34	15	....
East North Central	1919	231	53	92	61	10	12	2	3
	1914	266	62	103	42	8	33	18	....
West North Central	1919	161	97	21	19	8	3	14	....
	1914	281	98	28	13	12	54	76	....
South Atlantic	1919	108	48	27	20	10	3	....	....
	1914	121	50	31	15	10	15	....	....
East South Central	1919	39	2	21	11	5	....	....	....
	1914	47	5	28	7	5	2	....	....
West South Central	1919	32	14	4	5	9	....	....	1
	1914	37	16	4	4	9	4	....	....
Mountain	1919	39	5	12	8	15	....	....	....
	1914	37	4	11	6	15	1	....	....
Pacific	1919	80	3	10	4	60	....	....	3
	1914	88	3	10	3	68	4	....	....
NEW ENGLAND:									
Maine	1919	13	3	6	2	1	1	....	....
	1914	17	4	6	1	1	5	....	....
New Hampshire	1919	13	7	2	1	2	....	1	....
	1914	14	5	2	2	2	1	2	....
Vermont	1919	9	7	1	1	....	....	....	....
	1914	9	7	1	1	....	....	....	....
Massachusetts	1919	51	17	9	21	3	1	....	....
	1914	61	15	12	22	3	8	1	....
Rhode Island	1919	4	1	....	3	....	....	....	....
	1914	6	2	....	3	....	1	....	....
Connecticut	1919	22	15	....	6	1	....	....	....
	1914	27	14	1	7	2	3	....	....
MIDDLE ATLANTIC:									
New York	1919	96	46	17	15	3	11	4	....
	1914	131	52	25	15	5	20	14	....
New Jersey	1919	38	21	2	6	5	3	1	....
	1914	43	24	5	2	6	5	1	....
Pennsylvania	1919	86	62	9	7	5	3	....	....
	1914	99	69	10	4	7	9	....	....
EAST NORTH CENTRAL:									
Ohio	1919	15	4	8	1	2	....	....	....
	1914	25	7	9	2	3	4	....	....
Indiana	1919	[6] 53	10	22	11	1	8	....	2
	1914	60	11	20	10	....	19	....	....
Illinois	1919	70	21	19	20	4	4	1	1
	1914	75	25	20	14	3	8	5	....
Michigan	1919	[6] 59	6	31	21	2	....	....	....
	1914	59	6	39	12	1	....	1	....
Wisconsin	1919	34	12	12	8	1	....	1	....
	1914	47	13	15	4	1	2	12	....
WEST NORTH CENTRAL:									
Minnesota	1919	23	11	4	5	1	....	2	....
	1914	47	8	7	2	3	10	17	....
Iowa	1919	68	43	5	9	1	1	9	....
	1914	113	43	9	7	1	10	43	....
Missouri	1919	[6] 26	13	8	2	3	1	....	....
	1914	35	14	8	1	3	9	....	....
North Dakota	1919	5	2	2	....	....	1	....	....
	1914	9	3	1	1	....	4	....	....
South Dakota	1919	12	10	....	1	....	....	1	....
	1914	17	7	1	1	2	2	4	....
WEST NORTH CENTRAL—Continued.									
Nebraska	1919	20	16	1	....	1	....	2	....
	1914	48	20	1	....	1	14	12	....
Kansas	1919	7	2	1	2	2	....	....	....
	1914	12	3	1	1	2	5	....	....
SOUTH ATLANTIC:									
Delaware	1919	7	5	1	....	....	1	....	....
	1914	8	4	2	1	....	1	....	....
Maryland	1919	16	7	5	1	1	2	....	....
	1914	18	8	5	....	1	4	....	....
District of Columbia	1919	2	1	....	....	1	....	....	....
	1914	3	....	....	2	1	....	....	....
Virginia	1919	17	3	4	8	2	....	....	....
	1914	22	4	6	6	2	4	....	....
West Virginia	1919	3	2	1	....	....	....	....	....
	1914	5	3	2	....	....	....	....	....
North Carolina	1919	22	9	6	5	2	....	....	....
	1914	20	9	6	3	2	....	....	....
South Carolina	1919	10	6	1	1	2	....	....	....
	1914	12	7	1	....	2	2	....	....
Georgia	1919	17	4	8	4	1	....	....	....
	1914	19	4	8	2	1	4	....	....
Florida	1919	14	11	1	1	1	....	....	....
	1914	14	11	1	1	1	....	....	....
EAST SOUTH CENTRAL:									
Kentucky	1919	10	1	8	....	1	....	....	....
	1914	13	1	9	2	1	....	....	....
Tennessee	1919	10	....	2	5	3	....	....	....
	1914	12	1	5	2	3	1	....	....
Alabama	1919	12	....	5	6	1	....	....	....
	1914	14	1	8	3	1	1	....	....
Mississippi	1919	7	1	6	....	....	....	....	....
	1914	8	2	6	....	....	....	....	....
WEST SOUTH CENTRAL:									
Arkansas	1919	1	....	1	....	....	....	....	....
	1914	1	....	....	1	....	....	....	....
Louisiana	1919	[7] 4	1	1	1	2	....	....	....
	1914	4	1	1	....	2	....	....	....
Oklahoma	1919	2	....	....	1	1	....	....	....
	1914	5	1	2	1	1	....	....	....
Texas	1919	25	13	2	3	6	....	....	1
	1914	27	14	1	2	6	4	....	....
MOUNTAIN:									
Montana	1919	6	1	2	2	1	....	....	....
	1914	6	2	2	1	1	....	....	....
Idaho	1919	4	....	3	....	1	....	....	....
	1914	4	....	3	....	1	....	....	....
Wyoming	1919	2	....	2	....	....	....	....	....
	1914	1	....	1	....	....	....	....	....
Colorado	1919	[6] 10	3	3	4	1	....	....	....
	1914	8	1	2	4	....	1	....	....
New Mexico	1919	2	....	1	....	1	....	....	....
	1914	2	....	1	....	1	....	....	....
Arizona	1919	9	1	....	....	8	....	....	....
	1914	9	1	....	....	8	....	....	....
Utah	1919	4	....	1	2	1	....	....	....
	1914	4	....	2	1	1	....	....	....
Nevada	1919	2	....	....	....	2	....	....	....
	1914	3	....	....	....	3	....	....	....
PACIFIC:									
Washington	1919	12	2	6	4	....	....	....	....
	1914	13	2	6	3	....	2	....	....
Oregon	1919	11	1	3	....	7	....	....	....
	1914	9	1	3	....	5	....	....	....
California	1919	57	....	1	....	53	....	....	3
	1914	66	....	1	....	63	2	....	....

[1] Five establishments reported two kinds of gas made and sold separately.
[2] Includes 55 Pintsch gas plants distributed among 33 states.
[3] Distributing through mains only.
[4] Includes 61 Pintsch gas plants distributed among 31 states; and 4 blau gas plants located 1 each in Minnesota, Missouri, Nebraska, and New York.
[5] Includes 40 plants without distributing mains, selling compressed gas in containers, located as follows: 5 in Missouri; 4 in Massachusetts; 4 in Texas; 3 in Georgia; 3 in New Jersey; 2 each in California, Illinois, Indiana, Iowa, Minnesota, New York, and Ohio; and 1 each in Maryland, Nebraska, Pennsylvania, Rhode Island, Tennessee, Washington, and Wisconsin.
[6] One establishment reported mixed coal and water gas and oil gas made and sold separately.
[7] One establishment reported coal gas and oil gas made and sold separately.

During the five-year period the total number of plants decreased 20.4 per cent. In regard to this decrease certain contributing factors should be considered. One is the centralizing tendency by which establishments formerly manufacturing independently are acquired by public-service corporations and turned into distributing stations supplied from larger and more centrally situated plants, or find it to their advantage to cease manufacturing and to purchase gas from other establishments for distribution. In both these cases the plants concerned are not included in the census canvass. Another factor in the case of town and village gasoline gas and acetylene plants is the deterrent effect of the increasing use of electric current on the installation of gas plants capable of meeting a demand to which the production of gasoline gas and acetylene was no longer adequate.

Four states—Colorado, North Carolina, Oregon, and Wyoming—show an increase in the total number of gas plants in operation, while in 10 states the number remained the same as in 1914.

The following tabular statement shows the per cent of increase and decrease in the number of establishments and the quantity of gas produced, for each kind of gas:

KIND.	PER CENT OF INCREASE,[1] 1914 TO 1919.	
	Number of establishments.	Quantity of gas produced.
Total gas	−20.4	51.5
Mixed coal and water gas	29.3	108.5
Carbureted water gas	−6.7	0.9
Oil gas	−10.5	−6.6
Coal gas	−15.9	−23.6
Acetylene (sold through mains)	−70.4	−65.9
Gasoline (cold-process) gas	−80.4	−88.7

[1] A minus sign (−) denotes decrease.

Materials and products.—The special schedule used in collecting data for the industry called for a detailed report of the quantity and cost of the materials and fuel consumed during the year and of the quantity and value of all products manufactured. These figures are brought together in Table 12, which shows the total for the United States of each important material and product, for the years 1919, 1914, 1909, and 1904. The table shows also the unit cost and value for the principal items based on the quantity and the cost or value of same.

TABLE 12.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919, 1914, 1909, AND 1904.

	1919	1914	1909	1904
MATERIALS.				
Total cost	$157,550,882	$76,779,288	$52,427,844	$41,193,051
Coal used for gas making:				
Anthracite—				
Gross tons	1,307,383			
Cost	$11,326,268			
Average cost per ton	$8.66			
Bituminous—		6,116,672	4,940,598	4,431,774
Net tons	[1] 6,193,527	$20,872,517	$16,304,832	$14,607,485
Cost	$32,412,349	$3.41	$3.30	$3.30
Average cost per ton	$5.23			

TABLE 12.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919, 1914, 1909, AND 1904—Continued.

	1919	1914	1909	1904
MATERIALS—continued.				
Coke (purchased) used for gas making:				
Net tons	1,335,322	964,851	591,919	435,534
Cost	$11,781,932	$4,500,289	$2,667,706	$1,602,762
Average cost per ton	$8.82	$4.66	$4.51	$3.68
Oil used for gas making:				
Gallons	163,652,910			
Cost	$6,183,438			
Average cost per gallon	$0.038	715,418,623	578,309,411	
Oil used for enriching gas:		$24,720,998	$17,105,981	
Gallons	718,020,458	$0.034	$0.029	
Cost	$44,546,711			
Average cost per gallon	$0.062			
Benzene or benzol:				410,989,564
Gallons	14,155	388,146	253,837	$15,015,602
Cost	$3,107	$54,653	$27,543	$0.036
Average cost per gallon	$0.22	$0.14	$0.11	
Benzine, gasoline, and naphtha:				
Gallons	111,923	998,353	1,003,874	
Cost	$35,504	$169,020	$212,226	
Average cost per gallon	$0.32	$0.17	$0.19	
Calcium carbide:				
Pounds	1,049,222	31,749,491	6,080,465	(2)
Cost	$45,977	$887,937	$195,836	(2)
Average cost per pound	$0.044	$0.027	$0.032	.....
Lime, cost	$26,281	(2)	(2)	(2)
Oxide or purifying material, cost	$1,075,748	(2)	(2)	(2)
Gas purchased (43 establishments):				
M cu. ft	67,105,518			
Cost	$22,612,816			
Average cost per M cu. ft	$0.34			
Coke oven (16 est.)—				
M cu. ft	23,995,064			
Cost	$3,784,539			
Average cost per M cu. ft	$0.16			
Coal (5 est.)—				
M cu. ft	15,041,980			
Cost	$9,343,107			
Average cost per M cu. ft	$0.62	28,351,074	16,769,705	2,696,571
Mixed coal and water (6 est.)—		$8,883,016	$5,416,601	$937,252
M cu. ft	31,748	$0.31	$0.32	$0.35
Cost	$31,524			
Average cost per M cu. ft	$0.99			
Carbureted water (10 est.)—				
M cu. ft	14,932,670			
Cost	$7,476,894			
Average cost per M cu. ft	$0.50			
Natural (8 est.)—				
M cu. ft	13,104,056			
Cost	$1,976,752			
Average cost per M cu. ft	$0.15			
Boiler fuel, cost	$7,722,000	$3,784,911	$2,369,131	$2,298,168
Retort and bench fuel, cost	$854,754			
Water, cost	$576,599	(2)	(2)	(2)
All other materials, cost	$7,800,498	$5,512,723	$2,590,052	$2,718,797
Amount paid for lamps and appliances purchased for sale	$10,546,900	$7,393,224	$5,537,936	$4,013,885
PRODUCTS.				
Total value	[3]$329,278,908	[3]$220,237,790	$166,814,371	$125,144,945
Gas:				
For sale—				
M cu. ft	308,440,473	203,639,260	150,835,793	112,549,979
Value	$282,288,778	$175,065,920	$138,615,309	$112,652,568
Average value, M cu. ft	$0.92	$0.86	$0.92	$1.00
Plant consumption and loss, M cu. ft	35,679,338	1,121,108	1,730,563	1,363,757
Coal gas—				
M cu. ft	8,029,749	10,509,946	19,985,253	12,693,034
Value	$10,496,613	$10,726,514	$18,065,841	$12,868,604
Average value, M cu. ft	$1.31	$1.02	$0.90	$1.01
Carbureted water gas—				
M cu. ft	90,796,299	90,017,725	[4] 81,144,568	[4] 55,402,968
Value	$83,663,451	$74,516,534	$70,802,780	$48,903,620
Average value, M cu. ft	$0.92	$0.83	$0.87	$0.88
Mixed coal and water gas—				
M cu. ft	179,871,832	86,281,330	40,775,283	40,980,414
Value	$161,199,670	$72,012,021	$36,953,543	$45,605,263
Average value, M cu. ft	$0.90	$0.83	$0.91	$1.11
Oil gas—				
M cu. ft	15,421,836	16,512,274	8,688,860	3,441,352
Value	$18,747,496	$15,044,509	$12,111,458	$5,141,460
Average value, M cu. ft	$1.22	$0.91	$1.39	$1.49
Acetylene—				
Distributed through mains—				
M cu. ft	5,077	14,868		
Value	$69,647	$194,019		
Average value, M cu. ft	$13.72	$13.05		
Delivered in containers (compressed)[5]—			25,186	7,881
M cu. ft			$361,348	$104,267
Value	.....	121,696	$14.35	$13.23
Average value, M cu. ft	.....	$2,317,605		
		$19.04		
Gasoline (cold-process) gas—				
M cu. ft	20,428	181,412	216,643	24,330
Value	$41,169	$254,718	$320,339	$39,354
Average value, M cu. ft	$2.02	$1.40	$1.48	$1.62
Other gas (enriched natural)[6]—				
M cu. ft	14,295,252	.....	.....	.....
Value	$8,070,732	.....	.....	.....
Average value, M cu. ft	$0.56	.....	.....	.....

(See footnotes at end of table.)

TABLE 12.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919, 1914, 1909, AND 1904—Continued.

	1919	1914	1909	1904
PRODUCTS—continued.				
Coke:				
Production, net tons	4,278,533	3,582,565	2,631,997	2,714,152
For sale—				
Net tons	2,458,166	2,281,835	1,640,994	1,782,929
Value	$17,822,894	$8,719,920	$5,723,215	$5,195,461
Average value, ton	$7.25	$3.80	$3.50	$3.00
Made and consumed, net tons	1,820,367	1,300,730	991,003	931,223
Used in gas generators	663,265	.....	.....	.....
For retort and bench fuel	730,315	.....	.....	.....
Used otherwise	426,787	.....	.....	.....
Tar:				
Coal-gas tar—				
Production, gallons	65,824,282			
For sale—				
Gallons	61,969,577			
Value	$2,647,813			
Made and consumed, gallons	3,854,705	153,311,196	109,930,058	82,288,299
Water-gas and oil-gas tar—		125,938,607	[7] 78,339,880	67,515,421
Production, gallons	105,318,339	$3,252,765	$1,875,549	$2,064,343
For sale—		27,372,589	31,590,178	14,772,878
Gallons	58,557,947			
Value	$2,012,723			
Made and consumed, gallons	46,760,392			
Ammonia:				
Ammonia liquors—				
Gallons	23,393,320			
Value	$1,674,449			
Anhydrous ammonia—		50,737,762	37,277,864	
Pounds	1,846,024	$1,235,442	$725,702	
Value	$150,596			
Ammonium sulphate—				
Pounds	5,073,945	6,216,618	(2)	
Value	$205,101	$134,196	(2)	
Hydrocarbons:				
Gallons	491,559	(2)	(2)	
Value	$46,910	$35,902	$14,509	
Light oil and derivatives:				
Crude light oil—				
Production, gallons	6,491,113			
For sale—				
Gallons	285,071			
Value	$34,369			
Made and consumed, gallons	6,206,042			
Secondary light oil—				
Gallons	662,897			
Value	$45,841			
Benzol—				
Crude, gallons	3,738,844			
For sale—				(2)
Gallons	76,816			$972,992
Value	$14,974			
Made and consumed, gallons	3,662,028			
Refined (pure)—				
Gallons	3,147,751			
Value	$561,732			
Toluol—				
Crude, gallons	214,270			
For sale—				
Gallons	4,146			
Value	$1,023			
Made and consumed, gallons	210,124			
Refined (pure)—				
Gallons	165,612			
Value	$94,247			
Solvent naphtha—				
Gallons	187,034			
Value	$43,689			
Other refined oils—				
Gallons	567,252			
Value	$88,959	$20,815,871	$12,786,697	
Drip and holder oil:				
Gallons	2,659,080			
Value	$137,957			
Naphthalene:				
Crude—				
Production, pounds	1,757,317			
For sale—				
Pounds	521,459			
Value	$6,841			
Made and consumed, pounds	1,235,858			
Refined—				
Pounds	911,710			
Value	$45,585			
Pitch:				
Production, pounds	13,966,731			
For sale—				
Pounds	13,834,551			
Value	$92,988			
Made and consumed, pounds	132,180			
Retort carbon:				
Production, pounds	12,145,336			
For sale—				
Pounds	1,136,575			
Value	$9,370			
Made and consumed, pounds	11,008,761			
Lampblack (gas-house):				
Production, pounds	207,944,060			
For sale—				
Pounds	34,239,800			
Value	$107,201			
Made and consumed, pounds	173,704,260			

TABLE 12.—DETAILED STATISTICS OF QUANTITY AND VALUE: 1919, 1914, 1909, AND 1904—Continued.

	1919	1914	1909	1904
PRODUCTS—continued.				
Other by-products, value	$697,494			
Gas lime, value	$205			
Spent oxide, value	$32,358			
All other products, value	$3,055,869			
Receipts from rents and sales of lamps and appliances:				
Rents	$1,763,187	$10,977,774	$7,043,390	$4,249,581
Sales	$15,595,155			

[1] Includes 966 tons of cannel coal, valued at $8,818.
[2] Figures not available.
[3] In addition, the following products of gas manufacture were produced commercially by 5 establishments in 1919 and 6 in 1914, engaged primarily in other lines of manufacture:

KIND.	1919		1914	
	Quantity.	Value.	Quantity.	Value.
Total value	.....	$121,761	.....	$158,743
Gas (M cu. ft.)	64,199	112,480	56,939	131,979
Coal	17,576	29,158	41,744	45,394
Carbureted water	36,325	66,717	10,154	16,011
Oil	10,298	16,605	.....	.....
Acetylene (compressed)	.....	.....	5,041	70,574
Coke, net tons	913	6,017	2,287	9,355
Tar, gallons	23,200	1,635	35,100	2,076
Receipts from lamps and appliances	.....	1,629	.....	15,332

[4] Includes for 1909, 1,726,082 M cu. ft. of straight water gas, valued at $1,289,031: and for 1904, 715,550 M cu. ft., valued at $832,440.
[5] Included in chemicals in 1919 census; 311,390 M cu. ft., value $7,140,757, reported by 50 establishments.
[6] Enriched natural gas not reported prior to 1919.
[7] In addition, 13,813,058 gallons of tar were produced for which no value was reported.

Fuel used for power purposes and for heating retorts is not included with materials used in gas making, and its cost is shown separately. Quantity and cost are shown for each kind of gas purchased as a material, and the number of establishments purchasing each kind.

Though the increase in the quantity of materials used has been fairly uniform during the three five-year periods covered, a great difference is apparent in the cost in 1919 as compared with that in 1914. While the quantity of coal used increased 22.6 per cent, that of purchased coke 38.4 per cent, and that of oil 23.2 per cent, the total cost of coal increased 109.6 per cent, that of coke 161.8 per cent, and that of oil 105.2 per cent.

The difference between the cost per gallon of oil for gas making, 3.8 cents, and of that for enriching gas, 6.2 cents, is to be explained by the fact that four-fifths of the oil gas in the United States was made in California, where the transportation cost is relatively low, while much of the oil used for enriching carbureted water gas was consumed by plants situated far from the source of supply.

The purchase of gas for mixing has increased greatly since the previous census. In keeping with the relative and actual increase in the sale of mixed coal and water gas, the larger part of the gas purchased as a material was coal gas and coke-oven gas bought by plants manufacturing carbureted water gas, and carbureted water gas bought by plants manufacturing coal gas, for the purpose of mixing. Natural gas, the use of which as an ingredient in mixed gas has not appeared at any previous census, formed about one-fifth of the purchased gas.

The decrease in calcium carbide is due in part to the transfer to the chemical industry of establishments selling acetylene in containers.

The total value of the products of the gas industry in 1919 was 49.5 per cent greater than in 1914, while the value of gas alone was 61.2 per cent greater. The average unit value of all gas, which had dropped to 86 cents per M cubic feet in 1914, rose in 1919 to approximately 92 cents, which was also the average value in 1909.

The total quantity of gas produced for sale was 51.5 per cent more in 1919 than in 1914. About nine-tenths of this increase was in mixed coal and water gas, which represented 58.3 per cent of the total. The production of coal gas decreased 23.6 per cent, while that of oil gas was 6.6 per cent less in 1919 than in 1914.

In regard to the quantity of gas produced for sale it must be borne in mind that of the gas reported as purchased, under "Materials," 30,006,398 M cubic feet was the product of gas-manufacturing plants. As this was an ingredient in the gas sold by the purchasing establishments it entails a duplication in the total.

The average selling value of coke increased over 90 per cent, that of tar over 50 per cent, and that of ammonia liquors over 200 per cent, during the period from 1914 to 1919. The greater part of the coal-gas tar produced was sold, while nearly half of the water-gas and oil-gas tar was consumed in the producing plants, chiefly as fuel. A small proportion of the establishments broke up coal-gas tar for the segregation of the derivatives, some of which were sold in their crude form and some refined. Nearly all the crude benzol and toluol produced was refined in the producing plants, while over a third of the naphthalene was sold in the crude form.

By-products, gas and coking industries.—In this connection Table 13 is introduced to show the gas and other by-products of the coking industry—the by-products of retort coke ovens—in 1919 and 1914, as reported by the Geological Survey.

These by-products—tar, the ammonia products, benzol, toluol, solvent naphtha, naphthalene, etc.—are to be considered in conjunction with the output reported by the gas industry and are assembled in Table 14.

TABLE 13.—COKE-OVEN BY-PRODUCTS: 1919 AND 1914.

[Geological Survey.]

PRODUCT.	Production.	1919		1914	
		Sales.		Quantity.	Value.
		Quantity.	Value.		
Total	.....	.....	[1]$63,696,868	.....	.....
Gas.....M. cu. ft.	415,642,265	193,073,979	16,685,007	61,364,375	$6,009,583
Tar.....galls.	288,898,764	217,980,143	6,919,265	109,901,315	2,867,274
Ammonia:					
Sulphate.....lbs.	544,231,985	557,619,631	21,075,718	170,763,906	4,696,590
Liquor.....galls.	([2])	([2])	([2])	5,938,233	658,497
Anhydrous or free ammonia[3].....lbs.	50,535,639	51,646,744	5,692,950	25,370,509	2,300,137
Benzol products:					
Crude light oil...galls.	92,356,750	.....	.....		
Benzol crude.....galls.	44,060,970	44,697,615	7,776,669		
Benzol refined...galls.	17,006,532	18,403,909	3,783,552		
Toluol crude.....galls.	.....	.....	.....		
Toluol refined...galls.	1,160,136	1,353,827	355,990		
Solvent naphtha.galls.	3,915,489	3,625,978	552,853		
Other refined oils.galls.	575,885	127,483	18,358	([4])	997,007
Naphthalene crude.....lbs.	3,549,998	4,038,455	82,244		
Naphthalene refined.....lbs.	2,763,271	2,663,585	109,120		
Other by-products[4].....	.....	.....	645,142		

[1] Exclusive of coke breeze, production of which amounted to 1,839,291 short tons, valued at $2,442,541.
[2] Included in figures for Anhydrous or free ammonia.
[3] Includes liquor and sulphate sold on pound basis of NH_3.
[4] Figures not available.

TABLE 14.—GAS AND COKE-OVEN BY-PRODUCTS: 1919.

KIND.	Combined production.	The gas industry.	By-product coke industry.
Tar (coal-gas tar).....gallons.	354,723,046	65,824,282	288,898,764
Ammonia:			
Sulphate.....pounds.	549,305,930	5,073,945	544,231,985
Anhydrous or free ammonia...pounds.	52,381,663	1,846,024	[1] 50,535,639
Liquor.....gallons.	23,393,320	23,393,320	([2])
Crude light oil.....gallons.	98,847,863	6,491,113	92,356,750
Benzol:			
Crude.....gallons.	47,799,814	3,738,849	44,060,970
Refined.....gallons.	20,154,283	3,147,751	17,006,532
Toluol:			
Crude.....gallons.	214,270	214,270	.....
Refined.....gallons.	1,325,748	165,612	1,160,136
Solvent naphtha.....gallons.	4,102,523	187,034	3,915,489
Other refined oils.....gallons.	1,143,137	567,252	575,885
Naphthalene:			
Crude.....pounds.	5,307,315	1,757,317	3,549,998
Refined.....pounds.	3,674,981	911,710	2,763,271

[1] Includes liquor and sulphate sold on pound basis of NH_3.
[2] Included in figures for anhydrous or free ammonia.

Materials, by states.—Table 15 shows, by states, the quantity and cost of the principal purchased materials used by gas-manufacturing establishments during 1919 and the quantity of materials which were produced in the plants where consumed.

TABLE 15.—PRINCIPAL MATERIALS, BY STATES: 1919.

	Quantity.	Cost.
PURCHASED MATERIALS.		
Coal, anthracite, for gas making	*Gross tons.* 1,307,383	$11,326,268
Connecticut	38,633	$375,708
Delaware	15,128	114,298
Illinois	77,309	820,813
Maine	3,289	38,453
Maryland	91,663	828,482
Massachusetts	62,090	569,695
New Hampshire	5,384	63,277
New Jersey	134,288	1,124,776
New York	663,654	5,573,154
Pennsylvania	132,996	1,052,819
Rhode Island	4,532	45,728
Vermont	5,002	49,956
All other states	73,415	669,109
Coal, bituminous, for gas making	*Net tons.* 6,192,561	$32,403,531
Alabama	82,621	421,132
Colorado	133,232	642,715
Connecticut	196,648	1,208,236
Delaware	895	7,274
Georgia	92,704	481,341
Idaho	8,905	58,957
Illinois	325,322	1,795,927
Indiana	776,705	3,680,368
Iowa	64,860	432,202
Kansas	6,265	42,377
Kentucky	14,832	79,824
Maine	48,472	374,085
Maryland	11,507	66,085
Massachusetts	561,461	3,970,104
Michigan	746,648	3,846,952
Minnesota	82,662	637,116
Mississippi	22,853	140,844
Missouri	631,390	1,307,170
Montana	14,090	97,611
New Hampshire	15,056	120,694
New Jersey	26,463	141,164
New York	881,421	4,571,270
North Carolina	55,026	321,550
Ohio	37,769	174,646
Oregon	4,492	31,047
Pennsylvania	371,545	1,923,094
Rhode Island	177,056	1,292,180
South Dakota	1,366	11,037
Tennessee	83,389	400,309
Texas	18,434	133,907
Utah	34,386	170,029
Vermont	8,048	51,312
Virginia	103,423	559,245
Washington	149,471	890,367
Wisconsin	318,228	1,778,954
All other states	84,916	541,506
Coal, cannel, for gas making	966	8,818
Coke, purchased, for gas making	1,335,322	$11,781,932
Connecticut	7,791	65,368
Florida	12,457	170,346
Georgia	8,547	90,549
Illinois	486,049	4,507,997
Indiana	38,088	383,573
Iowa	64,339	723,323
Massachusetts	101,933	907,394
Michigan	3,164	32,561
Minnesota	15,655	142,200
Missouri	23,125	247,743
Nebraska	28,750	369,103
New Hampshire	8,361	77,128
New Jersey	94,245	643,687
New York	127,148	784,518
North Carolina	4,041	39,388
Ohio	2,511	23,241
Pennsylvania	176,607	1,139,759
South Carolina	9,505	101,357
South Dakota	7,852	104,238
Texas	41,696	459,869
Virginia	13,768	119,785
Wisconsin	12,128	123,996
All other states	47,562	524,809
Oil for gas making	*Gallons.* 163,652,910	$6,183,438
Arizona	3,950,846	219,619
California	126,520,238	4,912,499
Illinois	729,524	45,178
Massachusetts	633,663	53,753
Missouri	184,101	12,076
New Jersey	853,965	60,736
New York	342,943	20,626
Oregon	24,636,931	464,228
Pennsylvania	696,603	57,212
Tennessee	255,433	18,970
Texas	845,273	35,940
All other states	4,003,390	282,601

TABLE 15.—PRINCIPAL MATERIALS, BY STATES: 1919—Contd.

	Quantity.	Cost.
PURCHASED MATERIALS—continued.		
Oil for enriching gas	*Gallons.* 718,020,458	$44,546,711
Alabama	2,483,904	198,255
Colorado	1,955,365	145,282
Connecticut	14,054,015	1,050,201
Delaware	3,035,093	216,706
Florida	2,217,585	203,666
Georgia	5,441,222	457,985
Illinois	102,332,320	6,217,016
Indiana	9,088,528	634,587
Iowa	12,346,948	842,006
Kansas	234,905	12,317
Maine	904,826	74,451
Maryland	19,766,783	1,167,619
Massachusetts	39,888,508	2,664,958
Michigan	20,534,211	1,388,636
Minnesota	10,110,314	739,572
Missouri	9,874,667	601,893
Montana	385,510	26,430
Nebraska	6,552,526	447,445
New Hampshire	2,194,952	169,671
New Jersey	50,299,706	2,419,022
New York	256,088,705	17,117,110
North Carolina	1,137,090	96,423
Ohio	523,353	36,108
Pennsylvania	76,937,061	3,397,603
Rhode Island	6,000,966	412,420
South Carolina	2,130,619	157,694
South Dakota	1,201,358	96,027
Tennessee	2,600,904	181,189
Texas	13,798,435	464,739
Vermont	835,966	64,708
Virginia	7,125,049	529,405
Washington	5,623,586	336,538
Wisconsin	4,969,942	351,752
All other states	25,339,537	1,617,277
Benzene or benzol for gas making	14,155	$3,107
Benzine, gasoline, and naphtha	111,923	$35,504
Iowa	39,050	14,099
New York	20,841	5,109
All other states	52,032	16,296
Calcium carbide	*Pounds.* 1,049,222	$45,977
Illinois	74,700	3,477
Indiana	176,640	6,329
New Jersey	156,000	4,867
New York	275,367	16,127
Pennsylvania	74,100	2,555
All other states	292,415	12,622
Oxide or purifying material		$1,075,748
Alabama		3,078
Arizona		9,573
California		50,880
Colorado		1,764
Connecticut		36,017
Delaware		10,111
Florida		6,638
Georgia		2,370
Illinois		137,577
Indiana		27,390
Iowa		14,543
Kansas		1,024
Kentucky		1,944
Maine		7,670
Maryland		25,316
Massachusetts		81,440
Michigan		81,285
Minnesota		32,252
Mississippi		1,427
Missouri		39,854
Montana		1,114
Nebraska		6,043
New Hampshire		2,492
New Jersey		57,084
New York		203,481
North Carolina		2,032
North Dakota		313
Ohio		3,836
Oregon		18,081
Pennsylvania		114,668
Rhode Island		10,628
South Carolina		1,255
South Dakota		1,977
Tennessee		5,621
Texas		14,091
Utah		4,394
Virginia		11,953
Washington		2,813
Wisconsin		24,632
All other states		17,087

TABLE 15.—PRINCIPAL MATERIALS, BY STATES: 1919—Contd.

	Quantity.	Cost.
PURCHASED MATERIALS—continued.		
	M cu. ft.	
Gas purchased	67,105,518	22,612,816
California	12,312,002	1,773,440
Illinois	6,104,903	1,206,773
Indiana	1,198,137	216,164
Massachusetts	2,126,472	675,698
New Jersey	6,339,273	1,442,076
New York	13,054,951	8,774,408
Pennsylvania	14,150,700	6,802,314
All other states	11,819,080	1,721,943
MATERIALS PRODUCED AND CONSUMED IN SAME ESTABLISHMENT.		
	Net tons.	
Coke	1,820,367	.....
Used in gas generators	663,265	.....
For retort or bench fuel	730,315	.....
Used otherwise	426,787	.....
Alabama	37,775	.....
Colorado	38,175	.....
Connecticut	87,473	.....
Georgia	43,303	.....
Idaho	2,429	.....
Illinois	67,981	.....
Indiana	91,735	.....
Iowa	16,692	.....
Kansas	1,952	.....
Kentucky	3,691	.....
Maine	13,599	.....
Maryland	3,375	.....
Massachusetts	233,117	.....
Michigan	269,357	.....
Minnesota	42,221	.....
Mississippi	5,218	.....
Missouri	82,257	.....
Montana	5,004	.....
New Hampshire	3,442	.....
New Jersey	11,721	.....
New York	368,773	.....
North Carolina	15,511	.....
Ohio	8,456	.....
Oregon	1,236	.....
Pennsylvania	46,108	.....
Rhode Island	39,696	.....
Tennessee	32,374	.....
Texas	9,060	.....
Utah	15,295	.....
Virginia	51,770	.....
Washington	71,076	.....
Wisconsin	78,951	.....
All other states	21,539	.....
	Gallons.	
Coal-gas tar	3,854,705	.....
Connecticut	889,557	.....
Georgia	654,727	.....
Indiana	121,905	.....
Massachusetts	660,767	.....
Michigan	125,298	.....
Montana	126,436	.....
New Jersey	523,667	.....
New York	222,492	.....
Rhode Island	157,443	.....
Virginia	127,378	.....
All other states	245,035	.....
Water-gas and oil-gas tar	46,760,392	.....
California	882,835	.....
Colorado	195,520	.....
Connecticut	1,140,030	.....
Georgia	341,123	.....
Illinois	1,219,126	.....
Massachusetts	4,081,272	.....
Missouri	138,563	.....
Nebraska	618,351	.....
New Jersey	733,827	.....
New York	31,778,968	.....
Pennsylvania	1,061,239	.....
Rhode Island	484,548	.....
Tennessee	225,832	.....
Texas	832,343	.....
All other states	3,026,815	.....
	M cu. ft.	
Gas used on premises	7,491,158	.....
Indiana	3,968,967	.....
Missouri	2,023,272	.....
New York	230,144	.....
Rhode Island	474,974	.....
All other states	793,801	.....

Owing to the increase in the unit costs of the various materials, as shown in Table 12, the difference between the material costs in 1914 and 1919 bears no definite relation to the actual growth of the industry. Any comparison, therefore, between consumption of materials and other aspects of the industry must be based on quantities.

New York was the heaviest user of coal for gas making, consuming 51 per cent of the anthracite and 14 per cent of the bituminous. Illinois led in the consumption of purchased coke, using 36 per cent of the total. California consumed 77 per cent of the oil used for gas making, while 36 per cent of the oil used for enriching gas was consumed in New York. Of all coke produced, 43 per cent was consumed in the producing plants, and the amount of this coke made and consumed was 36 per cent greater than that of coke purchased.

Products, by states.—Table 16 shows, by principal states, the quantity and value of the chief products in 1919.

TABLE 16.—PRODUCTS, BY STATES: 1919.

PRODUCT AND STATE.	Quantity.	Value.
	M cu. ft.	
GAS, TOTAL (FOR SALE)	308,440,473	$282,288,778
Alabama	1,212,748	1,353,023
Arizona	360,729	651,307
California	25,145,377	19,885,050
Colorado	2,005,498	2,020,345
Connecticut	6,133,336	7,052,752
Delaware	773,368	936,757
Florida	996,777	1,477,058
Georgia	2,097,916	2,665,166
Idaho	89,364	196,190
Illinois	36,520,788	32,446,256
Indiana	8,195,804	6,761,689
Iowa	4,047,690	4,982,122
Kansas	140,026	345,713
Kentucky	175,841	278,131
Maine	680,716	1,045,830
Maryland	7,252,886	5,463,505
Massachusetts	20,177,804	21,500,458
Michigan	16,603,149	14 150,239
Minnesota	5,195,651	4,988,929
Mississippi	226,624	314,628
Missouri	7,648,192	6,830,202
Montana	235,330	394,872
Nebraska	1,644,175	2,137,335
New Hampshire	780,868	1,071,259
New Jersey	18,343,949	18,626,771
New York	76,730,459	62,362,211
North Carolina	768,736	1,195,703
North Dakota	147,754	293,332
Ohio	660,726	748,278
Oregon	2,556,215	2,329,590
Pennsylvania	33,662,922	28,113,111
Rhode Island	2,879,860	3,504,749
South Carolina	612,981	821,262
South Dakota	330,886	544,832
Tennessee	1,382,539	1,478,701
Texas	2,746,958	3,411,326
Utah	528,608	650,450
Vermont	279,076	427,440
Virginia	2,695,359	2,934,745
Washington	2,450,210	3,053,993
Wisconsin	7,238,943	6,232,033
All other states	6,184,557	6,611,435
Mixed coal and water gas	179,871,832	161,190,670
Alabama	1,106,684	1,164,485
Colorado	1,826,270	1,746,915
Connecticut	4,018,912	4,500,532
Georgia	1,445,957	1,714,872
Illinois	31,299,551	27,594,140
Indiana	5,183,339	3,866,123
Iowa	1,338,528	1,514,241
Massachusetts	18,132,994	18,812,440
Michigan	15,509,168	12,627,207
Minnesota	4,853,155	4,473,345
New Jersey	12,506,768	12,220,623
New York	37,321,574	28,441,162
North Carolina	356,205	516,432
Pennsylvania	15,153,512	15,023,901
Rhode Island	2,851,253	3,462,115
Tennessee	1,342,412	1,323,285
Texas	481,429	635,350
Virginia	2,290,365	2,529,169
Washington	2,227,705	2,671,172
Wisconsin	5,409,849	4,149,985
All other states	15,216,201	12,210,176

TABLE 16.—PRODUCTS, BY STATES: 1919—Continued.

PRODUCT AND STATE.	Quantity.	Value.
GAS, TOTAL (FOR SALE)—Continued.		
	M cu. ft.	
Carbureted water gas	90,796,299	83,663,451
Colorado	96,880	119,471
Connecticut	2,100,212	2,501,020
Delaware	770,480	928,977
Florida	604,991	903,214
Georgia	528,562	681,766
Illinois	4,131,266	3,420,400
Indiana	1,382,973	1,342,982
Iowa	2,560,171	3,142,977
Maine	157,581	250,510
Maryland	175,253	277,989
Massachusetts	1,460,963	1,823,317
Michigan	121,441	164,861
Minnesota	162,883	243,807
Missouri	1,181,112	1,631,390
Nebraska	1,620,330	2,092,217
New Hampshire	583,715	759,286
New Jersey	5,667,034	5,991,646
New York	38,917,795	33,096,884
North Carolina	154,243	259,140
Ohio	69,919	103,814
Pennsylvania	18,345,693	12,656,636
South Carolina	501,348	619,143
South Dakota	323,035	527,865
Texas	1,948,768	2,254,867
Vermont	206,311	311,762
Virginia	113,515	135,935
Wisconsin	646,697	799,472
All other states	6,262,528	6,619,103
Oil gas	15,421,836	18,747,496
Arizona	336,803	596,683
California	12,023,777	12,877,573
Illinois	43,390	267,875
Massachusetts	40,378	151,116
Missouri	26,388	190,380
New Jersey	48,717	244,297
New York	22,805	75,279
Oregon	2,481,915	2,205,074
Pennsylvania	37,021	241,211
Tennessee	13,737	116,851
Texas	76,472	254,901
All other states	270,433	1,526,256
Coal gas	8,029,749	10,496,613
Alabama	103,445	166,047
Colorado	76,742	106,199
Georgia	112,880	188,547
Idaho	85,473	164,161
Illinois	525,819	692,626
Indiana	1,175,489	1,127,605
Iowa	127,191	199,344
Kentucky	128,729	161,636
Maine	102,026	200,411
Maryland	85,567	144,517
Massachusetts	543,480	712,932
Michigan	959,328	1,252,092
Minnesota	172,447	230,176
Mississippi	185,887	259,180
Missouri	187,246	255,971
New York	464,290	717,860
North Carolina	252,926	373,807
Ohio	292,283	354,633
Oregon	42,208	77,867
Pennsylvania	126,338	186,589
Virginia	183,411	199,914
Washington	157,918	263,096
Wisconsin	1,177,122	1,267,032
All other states	761,495	1,194,281
Enriched natural gas	14,295,252	8,070,732
California	13,120,640	7,003,595
All other states	1,174,612	1,067,137
Acetylene, distributed through mains	5,077	69,647
Illinois	319	7,221
Indiana	778	10,053
New Jersey	244	6,619
New York	2,297	27,040
Pennsylvania	358	4,774
All other states	1,081	13,940
Gasoline (cold-process) gas	20,428	41,169
Iowa	9,447	18,184
New York	1,698	3,986
All other states	9,283	18,999
	Net tons.	
COKE (FOR SALE)	2,458,166	17,822,894
Alabama	13,869	116,364
Colorado	56,526	259,933
Connecticut	43,678	553,281
Georgia	14,803	91,044
Idaho	3,863	25,780
Illinois	123,631	895,054

TABLE 16.—PRODUCTS, BY STATES: 1919—Continued.

PRODUCT AND STATE.	Quantity.	Value.
COKE (FOR SALE)—Continued.		
	M cu. ft.	
Indiana	493,744	3,886,995
Iowa	22,347	224,082
Kansas	1,948	19,011
Kentucky	4,773	32,261
Maine	15,349	143,693
Maryland	3,155	17,156
Massachusetts	149,252	917,228
Michigan	238,411	1,997,534
Minnesota	12,628	97,117
Mississippi	9,434	52,853
Missouri	401,227	2,566,789
Montana	4,112	37,015
New Hampshire	6,982	58,770
New Jersey	5,677	36,823
New York	240,026	1,449,765
North Carolina	23,583	157,467
Ohio	13,607	82,766
Oregon	1,763	12,963
Pennsylvania	202,953	1,293,786
Rhode Island	86,181	678,477
Tennessee	23,820	143,322
Texas	1,506	11,946
Utah	7,238	42,904
Virginia	14,436	83,930
Washington	35,220	243,383
Wisconsin	138,948	1,164,199
All other states	48,476	429,203
	Gallons.	
COAL-GAS TAR (FOR SALE)	61,969,577	2,647,813
Alabama	726,295	24,252
Colorado	1,556,207	88,058
Connecticut	1,574,315	103,295
Georgia	401,246	16,764
Idaho	85,938	3,861
Illinois	3,250,659	135,443
Indiana	5,797,675	266,939
Iowa	640,738	27,758
Kansas	89,201	4,189
Kentucky	135,018	7,965
Maine	521,872	20,109
Maryland	106,001	4,793
Massachusetts	6,010,657	282,296
Michigan	8,290,451	291,739
Minnesota	1,161,648	52,557
Mississippi	202,069	13,854
Missouri	5,343,911	215,292
Montana	10,300	1,012
New Hampshire	188,500	7,669
New Jersey	729,583	22,018
New York	10,790,125	489,489
North Carolina	441,899	16,848
Ohio	421,061	19,142
Oregon	37,896	3,020
Pennsylvania	3,946,159	157,136
Rhode Island	1,752,159	60,278
Tennessee	673,387	23,139
Texas	188,567	12,120
Utah	377,446	15,439
Virginia	724,855	25,654
Washington	1,360,512	74,760
Wisconsin	3,538,452	127,404
All other states	894,825	33,512
WATER-GAS AND OIL-GAS TAR (FOR SALE)	58,557,947	2,012,723
Alabama	522,426	17,406
Arizona	2,923	288
California	239,780	2,847
Colorado	91,321	4,214
Connecticut	423,614	16,527
Florida	169,794	6,896
Georgia	159,160	5,804
Illinois	16,200,505	421,960
Indiana	993,478	23,329
Iowa	1,269,728	53,877
Maryland	3,162,174	169,210
Massachusetts	1,983,136	99,755
Michigan	1,496,795	40,948
Minnesota	1,573,566	77,537
Missouri	828,809	38,308
Montana	38,697	5,136
Nebraska	137,586	9,671
New Hampshire	29,129	686
New Jersey	5,905,498	185,979
New York	8,401,644	455,756
North Carolina	26,765	879
Ohio	51,945	1,854
Oregon	720,042	2,627
Pennsylvania	9,201,585	214,034
Rhode Island	25,417	2,110
South Carolina	175,660	8,382
South Dakota	7,937	491
Tennessee	22,175	894
Texas	210,429	8,121
Virginia	799,890	23,585
Washington	1,067,587	43,675
Wisconsin	692,547	20,552
All other states	1,866,205	49,385

TABLE 16.—PRODUCTS, BY STATES: 1919—Continued.

PRODUCT AND STATE.	Quantity.	Value.
RECEIPTS FROM RENTS AND SALES OF LAMPS AND APPLIANCES	.....	17,358,342
Alabama	.....	120,882
Arizona	.....	32,217
California	.....	265,507
Colorado	.....	68,030
Connecticut	.....	404,651
Delaware	.....	107,831
Florida	.....	242,898
Georgia	.....	152,174
Idaho	.....	14,871
Illinois	.....	2,480,501
Indiana	.....	438,370
Iowa	.....	403,572
Kansas	.....	30,111
Kentucky	.....	20,019
Maine	.....	140,398
Maryland	.....	783,794
Massachusetts	.....	1,082,150
Michigan	.....	1,258,047
Minnesota	.....	289,910
Mississippi	.....	29,557
Missouri	.....	404,931
Montana	.....	38,891
Nebraska	.....	253,246
New Hampshire	.....	40,515
New Jersey	.....	1,425,887
New York	.....	3,580,695
North Carolina	.....	148,053
North Dakota	.....	5,703
Ohio	.....	24,346
Oregon	.....	196,234
Pennsylvania	.....	914,125
Rhode Island	.....	146,875
South Carolina	.....	73,261
South Dakota	.....	67,421
Tennessee	.....	144,291
Texas	.....	153,181
Utah	.....	70,404
Vermont	.....	24,868
Virginia	.....	70,819
Washington	.....	171,688
Wisconsin	.....	511,326
All other states	.....	526,092

Of all gas manufactured for sale, 25 per cent by quantity and 22 per cent by value was produced in New York, which also ranked first in the production of carbureted water gas and mixed coal and water gas. Indiana and Wisconsin each reported nearly 15 per cent of the total production of coal gas. California and Oregon together produced 94 per cent of the oil gas, and 45 per cent of the acetylene sold through mains was in New York.

Table 17 shows, for the total gas production and for each kind, the number of establishments and the quantity produced for sale in 1919 and 1914, for the principal states arranged according to production in 1919.

TABLE 17.—GAS PRODUCTION, BY KINDS, AND NUMBER OF ESTABLISHMENTS, BY STATES: 1919 AND 1914.

STATE.	NUMBER OF ESTABLISHMENTS.		GAS PRODUCED FOR SALE: M CUBIC FEET.	
	1919	1914	1919	1914
ALL GAS.				
United States	1,022	1,284	308,440,473	203,639,260
New York	96	131	76,730,459	54,776,737
Illinois	70	75	36,520,788	27,066,585
Pennsylvania	86	99	33,662,922	14,718,834
California	57	66	25,145,377	15,192,904
Massachusetts	51	61	20,177,864	13,431,185
New Jersey	38	43	18,343,949	12,774,402
Michigan	59	59	16,603,149	6,986,926
Indiana	53	60	8,195,804	5,602,717
Missouri	26	35	7,648,192	6,432,786
Maryland	16	18	7,252,886	4,083,192
Wisconsin	34	47	7,238,943	2,884,187
Connecticut	22	27	6,133,336	4,439,924
Minnesota	23	47	5,195,651	4,400,936
Iowa	68	113	4,047,690	3,310,866
Rhode Island	4	6	2,879,860	2,415,708
Texas	25	27	2,745,958	1,597,882

TABLE 17.—GAS PRODUCTION, BY KINDS, AND NUMBER OF ESTABLISHMENTS, BY STATES: 1919 AND 1914—Continued.

STATE.	NUMBER OF ESTABLISHMENTS.		GAS PRODUCED FOR SALE: M CUBIC FEET.	
	1919	1914	1919	1914
ALL GAS—Continued.				
Virginia	17	22	2,595,359	1,878,77
Oregon	11	9	2,556,215	1,739,62
Washington	12	13	2,450,219	1,947,29
Georgia	17	19	2,097,916	1,567,17
Colorado	10	8	2,005,498	1,733,44
Nebraska	20	48	1,644,175	1,305,33
Tennessee	10	12	1,382,539	1,169,65
Alabama	12	14	1,212,748	925,27
Florida	14	14	996,777	714,36
New Hampshire	13	14	780,868	580,74
Delaware	7	8	773,368	564,69
North Carolina	22	20	768,736	493,00
Maine	13	17	680,716	546,30
Ohio	15	25	660,726	1,147,15
South Carolina	10	12	612,981	380,80
Arizona	9	9	360,729	168,85
South Dakota	12	17	330,886	232,74
Vermont	9	9	279,076	227,21
Montana	6	6	235,339	156,19
Mississippi	7	8	226,624	202,99
Kentucky	10	13	175,841	502,46
North Dakota	5	9	147,754	182,26
Kansas	7	12	140,026	94,31
All other states	26	32	6,802,529	5,062,79
COAL GAS.				
United States	233	277	8,029,749	10,509,940
Wisconsin	12	15	1,177,122	1,019,536
Indiana	22	20	1,175,489	482,220
Michigan	31	39	959,328	1,514,418
Massachusetts	9	12	543,480	761,087
Illinois	19	20	525,819	876,185
New York	17	25	464,290	1,822,078
Ohio	8	9	292,283	197,150
North Carolina	6	6	252,926	176,017
Missouri	8	8	187,246	157,536
Mississippi	6	6	185,887	129,280
Virginia	4	6	183,411	221,068
Minnesota	4	7	172,447	259,814
Washington	6	6	157,918	168,887
Kentucky	8	9	128,729	126,061
Iowa	5	9	127,191	387,126
Pennsylvania	9	10	126,338	729,695
Georgia	8	8	112,889	148,267
Alabama	5	8	103,445	123,232
Maine	6	6	102,026	112,961
Maryland	5	5	85,567	72,323
All other states	35	43	965,918	1,025,006
CARBURETED WATER GAS.				
United States	401	430	90,796,299	90,017,725
New York	46	52	38,917,795	34,593,594
Pennsylvania	62	69	18,345,693	3,896,311
New Jersey	21	24	5,667,034	8,222,442
Illinois	21	25	4,131,266	24,038,259
Iowa	43	43	2,560,171	1,730,540
Connecticut	15	14	2,100,212	1,592,552
Texas	13	14	1,948,768	1,244,171
Nebraska	16	20	1,620,330	1,264,451
Massachusetts	17	15	1,460,963	711,761
Indiana	10	11	1,382,973	1,173,224
Missouri	13	14	1,181,112	625,809
Wisconsin	12	13	646,697	471,177
Florida	11	11	604,991	412,440
New Hampshire	7	5	583,715	180,018
Georgia	4	4	528,562	370,423
South Carolina	6	7	501,348	357,500
South Dakota	10	7	323,635	194,187
Vermont	7	7	206,311	164,204
Maryland	7	8	175,253	4,005,066
Minnesota	11	8	162,883	68,610
North Carolina	9	9	154,243	80,093
Michigan	6	6	121,441	49,457
Virginia	3	4	113,515	76,293
Ohio	4	7	69,919	262,891
All other states	27	33	7,287,469	4,232,252
MIXED COAL AND WATER GAS.				
United States	190	147	179,871,832	86,281,339
New York	15	15	37,321,574	18,289,899
Illinois	20	14	31,299,551	2,080,287
Massachusetts	21	22	18,132,994	11,888,076
Michigan	21	12	15,509,168	5,407,222
Pennsylvania	7	4	15,153,512	10,053,404
Wisconsin	8	4	5,409,849	1,360,350
Indiana	11	10	5,183,339	3,926,280
Connecticut	6	7	4,018,912	2,818,153
Rhode Island	3	3	2,851,253	2,352,355
Virginia	8	6	2,290,365	1,572,249
Washington	4	3	2,227,705	1,694,906
Colorado	4	4	1,826,270	1,581,433
Iowa	9	7	1,338,528	1,106,466
Alabama	6	3	1,106,684	790,225
North Carolina	5	3	356,206	229,664
All other states	42	30	35,845,922	21,130,370

TABLE 17.—GAS PRODUCTION, BY KINDS, AND NUMBER OF ESTABLISHMENTS, BY STATES: 1919 AND 1914—Continued.

STATE.	NUMBER OF ESTABLISHMENTS.		GAS PRODUCED FOR SALE: M CUBIC FEET.	
	1919	1914	1919	1914
OIL GAS.				
United States	137	153	15,421,836	16,512,274
California	53	63	12,023,777	13,916,848
Oregon	7	5	2,481,915	1,680,381
Arizona	8	8	336,803	163,864
All other states	69	77	579,341	751,181
ACETYLENE.				
United States	37	165	5,077	14,868
New York	11	20	2,297	3,129
Indiana	8	19	778	1,736
Pennsylvania	3	9	358	689
Illinois	4	8	319	632
All other states	11	109	1,325	8,682
GASOLINE GAS.				
United States	22	112	20,428	181,412
Iowa	9	43	9,447	67,925
New York	4	14	1,698	8,722
All other states	9	55	9,283	104,765
ENRICHED NATURAL GAS.				
United States	7	.....	14,295,252	.....
California	3	.....	13,120,640	.....
All other states	4	.....	1,174,612	.....

The figures show a decrease in total production in three states only, Kentucky, North Dakota, and Ohio. In more than half the states, coal gas shows a decrease, while only four states, Illinois, Maryland, New Jersey, and Ohio, reported less carbureted water gas in 1919 than in 1914. An increase in the production of mixed coal and water gas was general, no state showing a decrease.

Mixed coal and water gas.—Table 18 shows, by geographic divisions, the total production of coal gas, and of carbureted water gas, including that sold as such and that entering into the composition of mixed coal and water gas.

The largest proportion of coal gas sold as such, 41 per cent, is shown for the West South Central division, while the largest portion entering into the production of mixed gas, 97.4 per cent, is found in the Middle Atlantic division.

The proportion of all water gas that was used in the production of mixed gas ran as high as 93.5 per cent in the East South Central division, while in the West South Central division it dropped to 8.5 per cent.

TABLE 18.—TOTAL PRODUCTION OF COAL GAS AND CARBURETED WATER GAS: 1919.

DIVISION.	COAL GAS.					CARBURETED WATER GAS.					MIXED COAL AND WATER GAS.		
	Total production, M cubic feet.	Sold as such.		Constituent of mixed gas.		Total production, M cubic feet.	Sold as such.		Constituent of mixed gas.		Production, M cubic feet.	Constituents: Per cent.	
		M cubic feet.	Per cent of total.	M cubic feet.	Per cent of total.		M cubic feet.	Per cent of total.	M cubic feet.	Per cent of total.		Coal gas.	Carbureted water gas.
United States	101,425,198	9,159,519	9.0	92,265,679	91.0	208,726,631	99,264,592	47.6	109,462,039	52.4	201,727,718	45.7	54.3
New England	12,451,378	841,164	6.8	11,610,214	93.2	21,010,044	4,950,260	23.6	16,059,784	76.4	27,669,998	42.0	58.0
Middle Atlantic	31,599,751	817,497	2.6	30,782,254	97.4	109,044,894	68,657,937	63.0	40,386,957	37.0	71,169,211	43.3	56.7
East North Central	35,796,094	4,604,389	12.9	31,191,705	87.1	41,749,754	6,717,100	16.1	35,032,654	83.9	66,224,359	47.1	52.9
West North Central	10,859,220	773,144	7.1	10,086,076	92.9	11,574,619	6,439,296	55.6	5,135,323	44.4	15,221,399	66.3	33.7
South Atlantic	4,554,134	802,300	17.6	3,751,834	82.4	16,878,821	7,903,332	46.8	8,975,489	53.2	12,727,323	29.5	70.5
East South Central	1,989,243	548,907	27.6	1,440,336	72.4	1,542,763	100,737	6.5	1,442,026	93.5	2,882,362	50.0	50.0
West South Central	281,302	115,388	41.0	165,914	59.0	4,595,174	4,203,255	91.5	391,919	8.5	557,833	29.7	70.3
Mountain	2,456,859	412,514	16.8	2,044,345	83.2	962,367	186,167	19.3	776,200	80.7	2,820,545	72.5	27.5
Pacific	1,437,217	244,216	17.0	1,193,001	83.0	1,368,195	106,508	7.8	1,261,687	92.2	2,454,688	48.6	51.4

Quality of gas.—At the census of 1914, out of 1,284 establishments covered, 1,055 reported the candlepower and 811 reported the heating value in British thermal units. In 1919, out of 1,022 establishments, only 389 reported candlepower, while 737 reported heating value. This illustrates the tendency resulting from the use of the incandescent mantle, by reason of which heating value instead of luminosity is becoming the standard of measurement. Table 19 shows the number of establishments and the quantity of gas, by geographic divisions, for specified groups based on the quality of gas in terms of British thermal units. While, in 1919, as in 1914, the group "575 to 625 B. t. u." has the largest number of establishments, the group "550 to 574 B. t. u." shows a relatively large increase, indicating that the prevailing standard is lower than in 1914. In agreement with this is the decrease in both of the higher groups.

TABLE 19.—HEATING VALUE—PRODUCTION ACCORDING TO QUALITY, BRITISH THERMAL UNITS PER CUBIC FOOT, BY GEOGRAPHIC DIVISIONS: 1919.

DIVISION.	TOTAL.		QUALITY NOT REPORTED.		LESS THAN 500 B. T. U.		500 TO 549 B. T. U.		550 TO 574 B. T. U.		575 TO 624 B. T. U.		625 TO 649 B. T. U.		650 AND OVER, B. T. U.	
	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.	Number of establishments.	Thousand cu. ft.
United States:																
1919	1,022	308,440,473	285	83,410,753	10	330,938	82	22,441,655	206	73,449,002	388	98,593,537	20	15,676,831	31	14,537,757
1914	1,284	203,639,260	473	(1)	.....	(1)	[2] 10	(1)	61	(1)	538	(1)	116	(1)	86	(1)
New England	112	30,931,720	15	270,740	.....	.....	45	20,728,829	27	4,457,200	23	5,447,513	.....	.....	2	27,438
Middle Atlantic	220	128,737,330	73	75,981,583	.....	.....	2	9,928	36	4,829,548	92	33,355,064	8	14,104,818	9	456,389
East North Central	231	69,219,410	66	3,832,574	1	5,027	5	579,667	49	37,909,936	104	25,761,563	1	8,475	5	1,122,168
West North Central	161	19,154,374	50	484,989	1	4,911	15	317,102	32	2,875,330	54	13,985,731	8	1,481,394	1	4,917
South Atlantic	108	19,394,939	32	1,475,199	.....	.....	6	220,619	15	7,926,207	47	9,670,362	2	45,286	6	57,266
East South Central	39	2,997,752	20	722,576	1	20,578	4	347,284	4	754,132	8	1,115,917	.....	.....	2	37,265
West South Central	32	4,507,251	12	160,180	3	221,448	1	22,654	6	348,581	10	3,754,388	.....	.....	.....	.....
Mountain	39	3,345,886	7	96,149	4	78,974	3	199,945	5	558,117	17	2,293,115	1	36,858	2	82,728
Pacific	80	30,151,811	10	386,763	.....	.....	1	15,627	32	13,789,951	33	3,209,884	.....	.....	4	12,749,586

[1] Figures not available. [2] Under 550 B. t. u.

Table 20 shows, by states, gas production distributed by kind and by British thermal-unit groups. The highest average heating value (631 B. t. u.) appears in Pennsylvania for mixed coal and water gas, and the lowest (540 B. t. u.) in Massachusetts for the same gas.

TABLE 20.—HEATING VALUE—PRODUCTION, BY KINDS OF GAS, FOR LEADING STATES: 1919.

KIND OF GAS AND STATE.	GAS PRODUCED FOR SALE BY ESTABLISHMENTS REPORTING QUALITY IN B. T. U.: 1919.										GAS PRODUCED BY ESTABLISHMENTS NOT REPORTING B. T. U.	
	Quantity (million cu. ft.).	Per cent of total.	Average B. t. u.	B. t. u. groups—million cu. ft.							Quantity (million cu. ft.).	Per cent of total.
				Less than 500.	500 to 549.	550 to 574.	575 to 599.	600 to 624.	625 to 649.	650 and over.		
MIXED COAL AND WATER GAS.												
United States	143,038	79.5	587	32	18,725	46,832	17,949	44,788	14,015	697	36,834	20.5
New York	4,427	11.9	592	.....	.....	23	3,621	124	659	.....	32,895	88.1
Illinois	29,058	92.8	566	.....	.....	28,135	854	69	.....	.....	2,242	7.2
Massachusetts	18,133	100.0	540	.....	16,429	1,085	619	.....	.....	.....	.....	.....
Michigan	14,847	95.7	595	.....	142	774	1,920	12,011	.....	.....	662	4.3
Pennsylvania	15,123	99.8	631	.....	.....	1,543	196	.....	13,356	28	31	0.2
All other	61,450	98.4	599	32	2,154	15,272	10,739	32,584	.....	669	1,004	1.6
CARBURETED WATER GAS.												
United States	46,075	50.7	580	222	3,222	9,831	14,954	15,836	1,497	513	44,721	49.3
New York	9,772	25.1	590	.....	.....	18	8,875	625	44	210	29,146	74.9
Pennsylvania	4,703	25.6	554	.....	10	3,011	1,384	263	6	29	13,643	74.4
New Jersey	5,644	99.6	602	.....	.....	11	.....	5,487	.....	146	23	0.4
Illinois	3,968	96.1	575	5	.....	2,024	1,868	71	.....	.....	163	3.9
Iowa	2,298	89.8	580	.....	48	1,139	55	1,047	9	.....	262	10.2
All other	19,690	92.9	570	217	3,164	3,628	2,772	8,343	1,438	128	1,484	7.1
COAL GAS.												
United States	6,968	86.8	587	21	455	2,018	1,542	2,668	54	210	1,062	13.2
Wisconsin	1,177	100.0	600	.....	.....	.....	.....	1,177	.....	.....	.....	.....
Indiana	1,124	95.7	556	.....	117	759	188	60	.....	.....	51	4.3
Michigan	742	77.4	583	.....	17	143	348	234	.....	.....	217	22.6
Massachusetts	543	100.0	571	.....	65	38	388	52	.....	.....	.....	.....
Illinois	404	76.8	567	.....	4	330	56	14	.....	.....	122	23.2
All other	2,978	81.6	602	21	252	748	562	1,131	54	210	672	18.4
OIL GAS.												
United States	[1] 14,481	96.8	562	.....	16	13,812	48	539	37	29	[1] 493	3.2
California	11,648	97.1	560	.....	16	11,387	23	213	.....	9	342	2.9
Oregon	2,472	100.0	571	.....	.....	2,403	25	33	.....	11	.....	.....
Arizona	309	91.7	603	.....	.....	.....	.....	272	37	.....	28	8.3
All other	52	29.7	600	.....	.....	22	.....	21	.....	9	123	70.3

[1] Not including Pintsch gas, of which 448 million cu. ft. was produced for sale.

Table 21 shows, by geographic divisions, the number of establishments reporting candlepower, classified by groups, for 1919 and 1914.

In 1909, 92 per cent of the establishments reported candlepower; in 1914, 82 per cent; and in 1919 only 38 per cent.

TABLE 21.—ILLUMINATING VALUE—NUMBER OF ESTABLISHMENTS REPORTING CANDLEPOWER: 1919 AND 1914.

DIVISION.	Census year.	Total number of establishments.	CANDLEPOWER GROUPS.[1] Not reporting candlepower.	Under 15.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	Over 25.
United States	1919	1,022	633	27	20	84	28	93	10	54	12	38	2	5	3	13
	1914	1,284	229	24	26	194	96	226	54	151	51	86	16	16	15	100
	1909	1,296	105	23	15	146	91	207	48	170	53	101	31	36	29	241
New England	1919	112	85	5	3	3	2	6	.....	3	.....	1	.....	.....	1	3
	1914	134	18	.....	1	15	20	32	7	19	4	5	3	2	1	7
Middle Atlantic	1919	220	145	3	.....	5	3	12	3	12	4	22	2	4	1	4
	1914	273	51	5	5	25	7	23	10	43	26	47	3	7	6	15
East North Central	1919	231	159	10	1	27	11	10	1	10	.....	1	.....	.....	1	.....
	1914	266	43	10	3	59	30	45	13	28	4	7	.....	2	2	20
West North Central	1919	161	70	6	6	24	3	33	3	7	.....	6	.....	.....	.....	3
	1914	281	90	1	4	43	15	43	4	20	3	13	6	5	6	28
South Atlantic	1919	108	58	1	2	9	3	14	2	12	3	2	.....	1	.....	1
	1914	121	11	2	2	17	6	27	10	18	6	6	3	.....	.....	13
East South Central	1919	39	19	1	6	6	.....	2	.....	3	1	1	.....	.....	.....	.....
	1914	47	3	2	5	15	5	11	.....	.....	.....	2	.....	.....	.....	4
West South Central	1919	32	17	1	.....	1	1	6	.....	5	.....	1	.....	.....	.....	.....
	1914	37	5	.....	.....	4	1	7	1	9	2	2	.....	.....	.....	6
Mountain	1919	39	27	.....	2	4	3	3	.....	.....	.....	.....	.....	.....	.....	.....
	1914	37	3	2	4	5	2	7	2	6	.....	3	.....	.....	.....	3
Pacific	1919	80	53	.....	.....	5	2	7	1	2	4	4	.....	.....	.....	2
	1914	88	5	2	2	11	10	31	7	8	6	1	1	.....	.....	4

[1] Per 5-foot burners.

Distribution.—Table 22 shows the quantity of gas sold, used on premises, and unaccounted for, by kind and by geographic divisions. This information is not available for prior censuses.

TABLE 22.—DISTRIBUTION OF GAS PRODUCED, BY KIND, AND BY GEOGRAPHIC DIVISIONS: 1919.

KIND AND DIVISION.	Total production (M cu. ft.).	SOLD. For illuminating, household, and industrial purposes.	SOLD. For distribution by other companies.	Used on premises.	Unaccounted for.
United States	344,119,811	[1]271,579,422	36,861,053	7,491,158	28,188,178
Mixed coal and water gas	201,727,718	165,488,341	14,383,491	7,017,680	14,838,206
Carbureted water gas	99,264,590	70,391,270	20,405,029	294,137	8,174,154
Oil gas	18,008,181	15,309,111	112,725	93,847	2,492,498
Coal gas	9,159,519	7,691,337	338,412	74,213	1,055,557
Other gas	15,959,803	12,699,363	1,621,396	11,281	1,627,763
Mixed coal and water gas:					
New England	27,669,998	22,935,463	2,639,056	595,691	1,499,788
Middle Atlantic	71,169,211	53,489,661	11,492,193	194,089	5,993,268
East North Central	66,224,359	57,476,231	218,117	4,096,903	4,433,108
West North Central	15,221,399	12,478,167	27,915	2,046,131	669,186
South Atlantic	12,727,323	11,530,316	.....	41,492	1,155,515
East South Central	2,882,362	2,449,096	.....	11,676	421,590
West South Central	557,833	495,906	6,210	2,320	53,397
Mountain	2,820,545	2,405,796	.....	4,958	409,791
Pacific	2,454,688	2,227,705	.....	24,420	202,563
Carbureted water gas:					
New England	4,950,260	4,300,117	237,272	18,161	394,710
Middle Atlantic	68,657,935	44,134,253	18,796,269	168,356	5,559,057
East North Central	6,717,100	5,308,441	1,043,855	15,564	349,240
West North Central	6,439,296	5,899,509	248	29,813	509,726
South Atlantic	7,903,332	6,785,339	327,385	39,053	751,555
East South Central	100,737	81,051	.....	242	19,444
West South Central	4,203,255	3,606,568	.....	21,529	575,158
Mountain	186,167	179,304	.....	1,208	5,655
Pacific	106,508	96,688	.....	211	9,609
Oil gas:					
New England	78,754	78,754	.....	.....	.....
Middle Atlantic	108,543	108,543	.....	.....	.....
East North Central	74,016	71,764	.....	27	2,225
West North Central	92,991	78,670	.....	.....	14,321
South Atlantic	49,020	49,020	.....	.....	.....

[1] Of this, 23,621,320 M cu. ft. were reported as sold for industrial use, but as many gas plants were unable to report gas sold for industrial use separate from that for illuminating and household use, this figure does not represent the total industrial use of gas.

TABLE 22.—DISTRIBUTION OF GAS PRODUCED, BY KIND, AND BY GEOGRAPHIC DIVISIONS: 1919—Continued.

KIND AND DIVISION.	Total production (M cu. ft.).	SOLD. For illuminating, household, and industrial purposes.	SOLD. For distribution by other companies.	Used on premises.	Unaccounted for.
Oil gas—Continued.					
East South Central	23,154	23,154	.....	.....	.....
West South Central	94,647	93,918	.....	.....	729
Mountain	455,155	412,321	.....	5,295	37,539
Pacific	17,031,901	14,392,967	112,725	88,525	2,437,684
Coal gas:					
New England	841,164	740,251	.....	10,872	90,041
Middle Atlantic	817,497	660,528	50,824	6,481	99,664
East North Central	4,604,389	3,849,715	280,326	39,993	434,355
West North Central	773,144	646,956	7,262	7,118	111,808
South Atlantic	802,300	702,404	.....	1,985	97,911
East South Central	548,907	444,451	.....	4,590	99,866
West South Central	115,388	97,481	.....	374	17,533
Mountain	412,514	348,465	.....	1,697	62,352
Pacific	244,216	201,086	.....	1,103	42,027
Other gas:					
New England	1,027	807	.....	.....	220
Middle Atlantic	5,157	5,061	.....	7	89
East North Central	1,130,769	970,961	.....	6,828	152,980
West North Central	16,705	15,647	.....	180	878
South Atlantic	475	475	.....	.....	.....
East South Central	.....	.....	.....	.....	.....
West South Central	258,347	207,168	.....	426	50,753
Mountain	.....	.....	.....	.....	.....
Pacific	14,547,323	11,499,244	1,621,396	3,840	1,422,843

Of the total production in 1919, 78.9 per cent was sold direct to consumers, and 10.7 per cent to other companies for distribution, while 2.2 per cent was used by the producing companies for heating retorts, lighting, etc., and the remainder, 8.2 per cent, reported as "unaccounted for", covered loss through leakage, etc. It was found impossible to obtain accurate data in regard to the gas used industrially, as many producers were unable to give segregated figures for household and industrial use. The amount reported as sold for industrial use, 23,621,320 M. cu. ft., does

not, therefore, represent the total, though it is probable that it covers the greater portion, as the companies which gave segregated figures were as a rule those situated in the chief industrial areas.

Consumers and population.—Table 23 shows the number of consumers reported, and the population of the territory served, for states and for geographic divisions. For the United States the ratio is 1 consumer to 5.2 persons in the territory supplied. The highest ratio of consumers to population was in the New England and Middle Atlantic divisions, where it was 1 to 4.7 while the lowest was in the East South Central division, 1 consumer to 11.1 of the population. Illinois shows the highest ratio, 1 to 4, and Oklahoma the lowest, 1 to 17.4.

Gas rates.—Table 24 shows the number of establishments and the amount of gas sold under certain specified rate groups, by states and by geographic divisions. It is difficult to make a satisfactory tabulation of the rates charged for gas, owing to the difference in rate scales, some companies basing their charges on a flat rate per thousand cubic feet, while others use a sliding scale, the rate varying in inverse ratio to the quantity of gas consumed. In cases where practically the entire output of a plant was sold at one rate or at rates within the limits of a rate group, the quantity was tabulated under the rate charged for the bulk of it, even though charges were computed on a sliding scale. On the other hand, the output of establishments basing their charges on a sliding scale so graduated that the preponderating portion of the gas could not be tabulated in any one of the rate columns, is included in the "sliding scale" column.

Of the total gas produced for sale, 51.3 per cent was reported by 6.7 per cent of the establishments at less than $1 per thousand cubic feet, while 6.8 per cent of the establishments reported one-tenth of 1 per cent of the gas at over $2 per thousand cubic feet. The latter includes the acetylene plants. The largest number of establishments under any one group was 229, or 22.4 per cent of the total, under the group "$1.55 to $2.00," with 1.6 per cent of the gas sold.

TABLE 23.—NUMBER OF CONSUMERS AND POPULATION OF TERRITORY SUPPLIED, BY GEOGRAPHIC DIVISIONS AND STATES: 1919.

DIVISION AND STATE.	Number of consumers.	Population of territory supplied.
UNITED STATES	8,253,165	42,991,579
GEOGRAPHIC DIVISIONS:		
New England	1,071,576	5,078,115
Middle Atlantic	3,199,457	15,098,982
East North Central	1,837,125	8,765,615
West North Central	619,667	3,336,070
South Atlantic	475,808	3,408,156
East South Central	91,705	1,018,038
West South Central	128,461	1,120,085
Mountain	118,649	925,842
Pacific	710,717	4,240,676
NEW ENGLAND:		
Maine	32,201	205,800
New Hampshire	35,567	225,900
Vermont	15,526	83,000
Massachusetts	661,106	3,042,232
Rhode Island	95,967	451,200
Connecticut	231,209	1,069,983
MIDDLE ATLANTIC:		
New York	1,852,874	8,234,956
New Jersey	646,953	2,724,014
Pennsylvania	699,630	4,140,012
EAST NORTH CENTRAL:		
Ohio	16,961	260,094
Indiana	226,198	1,357,618
Illinois	1,094,177	4,122,159
Michigan	387,685	2,019,781
Wisconsin	202,104	1,005,963
WEST NORTH CENTRAL:		
Minnesota	158,928	822,091
Iowa	152,732	826,554
Missouri	221,213	1,132,262
North Dakota	6,091	45,826
South Dakota	14,002	94,100
Nebraska	62,041	382,837
Kansas	4,660	32,400
SOUTH ATLANTIC:		
Delaware	24,558	158,800
Maryland	158,465	843,860
District of Columbia	76,676	423,664
Virginia	68,509	557,000
West Virginia	2,979	29,750
North Carolina	27,437	361,082
South Carolina	17,565	189,000
Georgia	58,875	520,000
Florida	40,744	325,000
EAST SOUTH CENTRAL:		
Kentucky	8,083	93,920
Tennessee	41,971	370,147
Alabama	32,993	427,971
Mississippi	8,658	126,000
WEST SOUTH CENTRAL:		
Arkansas	765	8,000
Louisiana	52,927	426,000
Oklahoma	862	15,000
Texas	73,907	671,085
MOUNTAIN:		
Montana	11,226	107,500
Idaho	4,821	43,000
Wyoming	1,461	22,000
Colorado	66,302	412,016
New Mexico	2,280	27,000
Arizona	12,970	125,036
Utah	17,061	169,000
Nevada	2,528	20,290
PACIFIC:		
Washington	92,956	719,000
Oregon	69,188	418,000
California	548,573	3,103,676

TABLE 24.—RATES (NET) CHARGED FOR GAS—QUANTITY OF GAS SOLD, BY RATE GROUPS, BY GEOGRAPHIC DIVISIONS: 1919.

DIVISION.	TOTAL.		UNDER $1.00.		$1.00 TO $1.25.		$1.30 TO $1.50.		$1.55 TO $2.00.		OVER $2.00.		SLIDING SCALE.		RATE NOT REPORTED.	
	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).	Number of establishments.	Gas sold (M cu. ft.).
United States	1,022	308,440,473	68	158,311,552	147	51,480,925	153	9,760,603	229	4,917,831	69	305,045	234	64,889,371	122	18,775,146
New England	112	30,931,720	1	22,244	26	17,731,928	13	1,166,791	29	1,019,076	13	135,209	26	10,809,249	4	47,223
Middle Atlantic	220	128,737,330	24	82,152,867	22	17,814,200	38	2,678,423	46	1,184,280	22	19,975	30	8,776,617	38	16,110,968
East North Central	231	69,219,410	26	27,636,997	48	4,872,691	31	841,970	30	629,219	13	5,472	56	34,090,875	27	1,142,186
West North Central	161	19,154,374	4	11,109,879	19	3,940,718	26	854,145	63	970,360	7	7,653	26	1,777,790	16	494,029
South Atlantic	108	19,394,939	5	11,074,914	11	2,542,610	19	1,352,440	30	512,079	6	15,475	26	3,224,188	11	73,233
East South Central	39	2,997,752	1	653,269	10	1,563,651	9	206,325	10	186,892	.....	.....	2	314,216	7	73,399
West South Central	32	4,507,251	1	12,000	3	876,020	10	2,397,672	3	42,552	1	12,605	8	1,098,462	6	67,940
Mountain	39	3,345,886	1	1,582,073	3	527,559	4	189,315	8	210,213	2	26,240	17	755,623	4	54,863
Pacific	80	30,151,811	5	23,467,509	5	1,611,548	3	73,522	10	163,160	5	82,416	43	4,042,351	9	711,305

Equipment.—No attempt was made to collect data in regard to production equipment, but certain data were asked for relative to the distributing systems. Table 25 shows the capacity of the gas storage holders, by states and by geographic divisions, in 1919. Of the total gas storage capacity in the United States, 38.8 per cent was reported from the Middle Atlantic division, which reported 41.7 per cent of the gas sold.

TABLE 25.—GAS STORAGE HOLDERS, BY GEOGRAPHIC DIVISIONS AND STATES: 1919.

DIVISION AND STATE.	Holder capacity.	DIVISION AND STATE.	Holder capacity.
	M cu. ft.		*M. cu. ft*
UNITED STATES	835,041	SOUTH ATLANTIC:	
		Delaware	2,035
GEOGRAPHIC DIVISIONS:		Maryland	20,715
New England	136,623	District of Columbia	8,100
Middle Atlantic	324,419	Virginia	3,900
East North Central	174,005	West Virginia	173
West North Central	58,201	North Carolina	2,098
South Atlantic	47,931	South Carolina	1,215
East South Central	10,503	Georgia	5,764
West South Central	19,336	Florida	3,931
Mountain	6,912	EAST SOUTH CENTRAL:	
Pacific	57,111	Kentucky	786
		Tennessee	2,370
NEW ENGLAND:		Alabama	6,321
Maine	3,987	Mississippi	1,026
New Hampshire	3,004	WEST SOUTH CENTRAL:	
Vermont	1,156	Arkansas	220
Massachusetts	90,002	Louisiana	7,636
Rhode Island	15,677	Oklahoma	60
Connecticut	22,797	Texas	11,420
MIDDLE ATLANTIC:		MOUNTAIN:	
New York	210,160	Montana	975
New Jersey	53,335	Idaho	410
Pennsylvania	60,924	Wyoming	130
EAST NORTH CENTRAL:		Colorado	2,635
Ohio	5,723	New Mexico	100
Illinois	91,350	Arizona	805
Indiana	22,764	Utah	1,815
Michigan	37,002	Nevada	42
Wisconsin	17,166	PACIFIC:	
WEST NORTH CENTRAL:		Washington	6,847
Minnesota	15,452	Oregon	6,581
Iowa	10,774	California	43,683
Missouri	26,350		
North Dakota	610		
South Dakota	756		
Nebraska	3,914		
Kansas	345		

Distributing mains.—In Table 26 the miles of transmission and distributing mains reported in 1919 are tabulated, by states and by geographic divisions. New York ranked first, Illinois second, and California third in miles of mains, while in total quantity of gas produced these states ranked first, second, and fourth, respectively. The geographic division with the largest mileage was the Middle Atlantic, with 30.7 per cent of the total.

TABLE 26.—DISTRIBUTING MAINS, BY GEOGRAPHIC DIVISIONS AND STATES: 1919.

DIVISION AND STATE.	Miles.	DIVISION AND STATE.	Miles.
UNITED STATES.....1919..	69,742	SOUTH ATLANTIC:	
1914..	58,727	Delaware	222
		Maryland	969
GEOGRAPHIC DIVISIONS:		District of Columbia	550
New England	8,109	Virginia	699
Middle Atlantic	21,445	West Virginia	36
East North Central	15,836	North Carolina	498
West North Central	5,778	South Carolina	235
South Atlantic	4,512	Georgia	606
East South Central	1,247	Florida	697
West South Central	1,578	EAST SOUTH CENTRAL:	
Mountain	1,410	Kentucky	226
Pacific	9,827	Tennessee	315
		Alabama	495
NEW ENGLAND:		Mississippi	211
Maine	326	WEST SOUTH CENTRAL:	
New Hampshire	317	Arkansas	16
Vermont	134	Louisiana	474
Massachusetts	4,781	Oklahoma	15
Rhode Island	739	Texas	1,073
Connecticut	1,812	MOUNTAIN:	
MIDDLE ATLANTIC:		Montana	121
New York	12,119	Idaho	84
New Jersey	4,724	Wyoming	21
Pennsylvania	4,602	Colorado	675
EAST NORTH CENTRAL:		New Mexico	40
Ohio	650	Arizona	167
Indiana	2,904	Utah	263
Illinois	7,506	Nevada	39
Michigan	3,085	PACIFIC:	
Wisconsin	1,691	Washington	1,276
WEST NORTH CENTRAL:		Oregon	1,247
Minnesota	1,280	California	7,304
Iowa	1,745		
Missouri	1,726		
North Dakota	78		
South Dakota	179		
Nebraska	684		
Kansas	86		

Stoves and heaters.—Table 27 shows the number of gas stoves and heaters connected with mains at the end of the year, by states and geographic divisions for 1919, 1914, and 1909. These figures are not to be taken as complete, as several large producers stated that the data were not available in 1919, and the same condition prevailed in the previous years. In so far as they are shown, they cover only the heating attachments connected, or known to be connected, by the company reporting. The per cent column indicates the proportion which the gas produced by establishments reporting stoves and heaters bears to the total gas (excluding Pintsch gas, gasoline gas, and acetylene) produced for sale in 1919.

TABLE 27.—STOVES AND HEATERS CONNECTED WITH MAINS, BY GEOGRAPHIC DIVISIONS AND STATES: 1919, 1914, AND 1909.

DIVISION AND STATE.	1919			NUMBER OF STOVES AND HEATERS CONNECTED WITH MAINS AT END OF YEAR (AS REPORTED).		
	Number of establishments.		Per cent which gas produced for sale by establishments reporting stoves and heaters is of total.[1]			
	Total number.[1]	Number reporting stoves and heaters.		1919	1914	1909
UNITED STATES	911	801	65.1	5,469,126	5,168,924	3,603,435
NEW ENGLAND:						
Maine	11	11	100.0	37,206	28,172	6,002
New Hampshire	12	11	98.4	35,057	31,722	21,965
Vermont	9	8	95.8	13,217	11,677	8,943
Massachusetts	48	42	51.5	346,775	245,417	168,442
Rhode Island	4	3	94.6	73,786	19,301	17,228
Connecticut	21	18	81.1	167,415	103,369	68,936
MIDDLE ATLANTIC:						
New York	79	61	56.9	827,176	984,590	1,114,126
New Jersey	30	21	16.8	80,752	346,551	29,552
Pennsylvania	78	74	59.7	733,543	500,417	410,243
EAST NORTH CENTRAL:						
Ohio	13	10	46.1	12,455	19,184	15,951
Indiana	45	38	77.0	195,220	169,507	97,998
Illinois	64	60	98.3	754,393	620,911	437,447
Michigan	58	46	85.1	82,896	276,653	185,218
Wisconsin	33	31	32.4	87,341	141,720	91,208
WEST NORTH CENTRAL:						
Minnesota	20	18	8.7	20,263	42,779	22,736
Iowa	57	55	99.3	166,868	136,482	82,282
Missouri	24	19	9.4	28,494	139,422	119,592
North Dakota	4	4	100.0	6,446	8,588	3,752
South Dakota	11	11	100.0	16,679	11,286	6,635
Nebraska	18	18	100.0	76,191	71,317	49,199
Kansas	5	5	100.0	6,215	3,020	449
SOUTH ATLANTIC:						
Delaware	6	6	100.0	20,914	15,244	7,104
Maryland and District of Columbia	14	12	63.0	185,302	132,713	74,725
Virginia	15	15	100.0	68,731	47,985	27,065
West Virginia	3	3	100.0	3,073	2,928	465
North Carolina	20	19	97.9	44,236	21,711	5,230
South Carolina	8	8	100.0	30,362	18,620	6,024
Georgia	16	14	76.5	57,387	53,744	36,221
Florida	13	12	98.6	66,352	40,502	20,550
EAST SOUTH CENTRAL:						
Kentucky	9	9	100.0	6,389	68,393	19,085
Tennessee	7	7	100.0	77,822	50,063	29,567
Alabama	11	11	100.0	55,515	32,531	17,354
Mississippi	7	7	100.0	13,190	10,860	7,661
WEST SOUTH CENTRAL:						
Arkansas	1	1	100.0	765	1,255	6,077
Louisiana	3	3	100.0	103,375	55,375	20,432
Oklahoma	1	1	100.0	1,088	4,484	3,062
Texas	21	19	90.3	116,313	52,978	45,190
MOUNTAIN:						
Montana	5	5	100.0	12,116	8,604	2,766
Idaho	3	3	100.0	5,395	4,048	1,607
Wyoming	2	2	100.0	1,550	1,042	188
Colorado	10	7	96.1	105,985	92,789	60,459
New Mexico	2	2	100.0	1,900	1,883	651
Arizona	9	6	86.4	10,640	8,127	3,237
Utah	3	3	100.0	20,583	18,725	9,376
Nevada	2	2	100.0	1,809	1,820	864
PACIFIC:						
Washington	12	10	99.4	119,284	91,504	33,750
Oregon	10	6	97.8	58,399	47,231	22,924
California	54	44	70.3	512,254	371,671	183,897

[1] Not including Pintsch gas, gasoline (cold-process) gas, and acetylene.

Gas and electric light and power.—Table 28 shows the number of establishments which operated electric light and power plants in conjunction with the manufacture of gas, by states and by geographic divisions, in 1919 and 1914. While a decrease of nearly 12 per cent is evident in the total number operating electric plants, the relative number so engaged increased from 30 per cent in 1914 to over 33 per cent in 1919.

TABLE 28.—ESTABLISHMENTS OPERATING GAS AND ELECTRIC LIGHT AND POWER PLANTS IN CONJUNCTION, BY GEOGRAPHIC DIVISIONS AND STATES: 1919 AND 1914.

DIVISION AND STATE.	NUMBER OF ESTABLISHMENTS.		NUMBER OPERATING GAS AND ELECTRIC PLANTS IN CONJUNCTION.	
	1919	1914	1919	1914
UNITED STATES	1,022	1,284	341	385
GEOGRAPHIC DIVISIONS:				
New England	112	134	39	52
Middle Atlantic	220	273	63	73
East North Central	231	266	83	84
West North Central	161	281	54	52
South Atlantic	108	121	24	30
East South Central	39	47	14	23
West South Central	32	37	8	11
Mountain	39	37	18	14
Pacific	80	88	38	46
NEW ENGLAND:				
Maine	13	17	3	6
New Hampshire	13	14	4	5
Vermont	9	9	4	4
Massachusetts	51	61	16	21
Rhode Island	4	6	1	2
Connecticut	22	27	11	14
MIDDLE ATLANTIC:				
New York	96	131	37	46
New Jersey	38	43	8	4
Pennsylvania	86	99	18	23
EAST NORTH CENTRAL:				
Ohio	15	25	4	5
Indiana	53	60	16	16
Illinois	70	75	39	38
Michigan	59	59	7	8
Wisconsin	34	47	17	17
WEST NORTH CENTRAL:				
Minnesota	23	47	9	8
Iowa	68	113	20	19
Missouri	26	35	12	14
North Dakota	5	9	1	2
South Dakota	12	17	2	3
Nebraska	20	48	8	5
Kansas	7	12	2	1
SOUTH ATLANTIC:				
Delaware	7	8	.....	.....
Maryland	16	18	5	6
District of Columbia	2	3	.....	.....
Virginia	17	22	3	3
West Virginia	3	5	.....	1
North Carolina	22	20	8	6
South Carolina	10	12	4	4
Georgia	17	19	2	5
Florida	14	14	2	5
EAST SOUTH CENTRAL:				
Kentucky	10	13	5	7
Tennessee	10	12	3	5
Alabama	12	14	3	6
Mississippi	7	8	3	5
WEST SOUTH CENTRAL:				
Arkansas	1	1	1	1
Louisiana	4	4	1	2
Oklahoma	2	5	1	3
Texas	25	27	5	5
MOUNTAIN:				
Montana	6	6	2	.....
Idaho	4	4	.....	.....
Wyoming	2	1	1	1
Colorado	10	8	4	3
New Mexico	2	2	2	2
Arizona	9	9	7	6
Utah	4	4	1	1
Nevada	2	3	1	1
PACIFIC:				
Washington	12	13	4	4
Oregon	11	9	4	5
California	57	66	30	36

Municipal establishments.—The establishments owned by municipalities are operated under conditions somewhat different from the commercial companies, and the statistics therefor, though included in the other tables, are presented in Table 29 in detail.

The gas works of Philadelphia, though owned by the city, are operated by a private corporation and are not here included. The decrease of 81 in number of establishments in 1919, as compared with 1914, is in the town and village acetylene and gasoline plants of the North Central and South Atlantic states.

TABLE 29.—MUNICIPAL ESTABLISHMENTS: 1919 AND 1914.

	UNITED STATES.		GEOGRAPHIC DIVISION.					
			New England.		Middle Atlantic.		East North Central.	
	1919	1914	1919	1914	1919	1914	1919	1914
Number of establishments [1]	57	138	5	5	5	5	8	26
Number manufacturing:								
Straight coal gas	11	11	1	1	.....	.....	1	.....
Carbureted water gas	18	18	1	2	1	1	3	3
Mixed coal and water gas	6	3	3	2	.....	.....	1	.....
Oil gas	2	4	.....	.....	.....	.....	.....	.....
Acetylene	8	31	.....	.....	4	3	1	9
Gasoline (cold-process) gas	12	71	.....	.....	.....	1	2	14
Number operating gas and electric light and power plants in conjunction	14	16	3	5	1	.....	1	2
Persons engaged	666	542	248	193	7	8	80	42
Salaried employees	93	112	32	45	2	2	18	10
Wage earners (average number)	573	430	216	148	5	6	62	32
Primary horsepower	2,693	2,224	249	174	10	13	266	272
Capital	$7,858,740	$5,554,187	$2,526,077	$1,353,060	$104,764	$84,280	$955,690	$273,137
Salaries and wages	$771,452	$337,659	$202,426	$124,222	$5,006	$4,017	$84,612	$19,668
Salaries	$105,172	$65,918	$28,973	$24,539	$2,600	$315	$23,865	$2,381
Wages	$666,280	$271,741	$263,453	$99,683	$2,406	$3,702	$60,747	$17,287
Cost of materials	$1,366,703	$717,371	$288,979	$167,021	$25,308	$10,831	$150,118	$70,625
Value of products	$2,778,069	$1,757,017	$653,314	$473,620	$32,107	$24,103	$313,482	$101,004
Value added by manufacture [2]	$1,411,366	$1,039,646	$364,335	$306,599	$6,799	$13,272	$163,364	$30,379
MATERIALS.								
Total cost	$1,366,703	$717,371	$288,979	$167,021	$25,308	$10,831	$150,118	$70,625
Coal used for gas making:								
Net tons	66,965	74,944	25,477	27,124	728	377	13,533	.....
Cost	$395,767	$256,579	$166,800	$119,165	$7,011	$2,020	$63,806	.....
Coke, purchased, used for gas making:								
Net tons	8,680	5,709	1,500	610	.....	.....	1,780	1,809
Cost	$90,754	$28,685	$12,750	$2,709	.....	.....	$18,739	$8,503
Oil used for gas making and enriching:								
Gallons	5,442,952	3,790,220	717,751	537,414	84,123	62,928	353,862	383,657
Cost	$429,850	$182,559	$62,399	$27,277	$4,760	$2,517	$28,122	$14,109
Gasoline for gas making:								
Gallons	53,621	746,371	.....	.....	.....	1,430	11,220	151,940
Cost	$18,820	$130,000	.....	.....	.....	$420	$3,894	$27,758
Calcium carbide:								
Pounds	263,200	1,612,275	.....	.....	178,800	736,000	34,000	207,400
Cost	$11,532	$33,508	.....	.....	$7,244	$5,060	$1,564	$7,022
Fuel for boilers and retorts, cost	$39,363	$30,270	$1,615	$722	$3,506	$389	$16,410	$5,637
Amount paid for lamps and appliances purchased for sale	$37,412	$16,634	$1,480	$8,031	.....	$140	$712	$146
All other materials, cost	$343,205	$39,136	$43,035	$9,117	$2,787	$276	$16,871	$7,450
PRODUCTS.								
Total value	$2,778,069	$1,757,017	$653,314	$473,620	$32,107	$24,103	$313,482	$101,004
Gas:								
M cubic feet	2,186,039	1,636,371	450,237	383,813	21,131	13,093	210,829	100,749
Value	$2,520,698	$1,579,886	$597,086	$390,291	$32,107	$23,932	$249,932	$98,548
Straight coal gas—								
M cubic feet	307,962	252,438	5,651	44,600	.....	.....	73,000	.....
Value	$361,131	$237,377	$13,067	$44,600	.....	.....	$90,540	.....
Carbureted water gas—								
M cubic feet	414,166	227,926	87,000	4,746	19,918	12,158	77,034	70,261
Value	$543,405	$173,384	$103,000	$6,317	$23,561	$15,198	$90,923	$49,092
Mixed coal and water gas—								
M cubic feet	1,411,699	996,452	357,586	334,467	.....	.....	58,190	.....
Value	$1,510,614	$910,861	$481,019	$339,374	.....	.....	$63,372	.....
Oil gas—								
M cubic feet	37,596	22,195	.....	.....	.....	.....	.....	.....
Value	$66,145	$28,123	.....	.....	.....	.....	.....	.....
Acetylene—								
M cubic feet	1,762	4,477	.....	.....	1,213	700	185	808
Value	$14,500	$50,321	.....	.....	$8,546	$8,204	$1,827	$10,516
Gasoline (cold-process) gas—								
M cubic feet	12,854	132,883	.....	.....	.....	235	2,420	29,590
Value	$24,903	$179,820	.....	.....	.....	$530	$3,270	$38,940
Coke:								
For sale—								
Net tons	18,345	22,996	4,890	8,894	.....	.....	5,471	.....
Value	$116,549	$82,536	$31,465	$32,939	.....	.....	$43,121	.....
Made and consumed, tons	46,610	.....	11,513	.....	.....	.....	508	.....
Tar:								
Gallons	1,463,299	1,179,843	386,857	335,051	.....	.....	154,796	14,667
Value	$58,306	$33,117	$18,781	$7,992	.....	.....	$8,087	$440
All other products, value	$15,235	$37,404	$5,918	$31,548	.....	.....	$1,410	$1,516
Receipts from rents and sales of lamps and appliances	$67,281	$24,074	$64	$10,850	.....	$171	$10,932	$500
MAINS.								
Miles of mains	829	927	208	147	23	21	85	125

[1] Distribution, by states:
New England, 1919—Maine, 1 establishment; Massachusetts, 3; Connecticut, 1; 1914—Massachusetts, 4; Connecticut, 1.
Middle Atlantic, 1919—New York, 2 establishments; New Jersey, 2; Pennsylvania, 1; 1914—New York, 3; New Jersey, 1; Pennsylvania, 1.
East North Central, 1919—Ohio, 2 establishments; Indiana, 1; Illinois, 1; Michigan, 3; Wisconsin, 1; 1914—Ohio, 2; Indiana, 7; Illinois, 4; Michigan, 1 Wisconsin, 12

[2] Value of products less cost of materials.

TABLE 29.—MUNICIPAL ESTABLISHMENTS: 1919 AND 1914—Continued.

	GEOGRAPHIC DIVISION.								
	West North Central.		South Atlantic.		East South Central.		Mountain (Arizona).	Pacific (California).	
	1919	1914	1919	1914	1919	1914	1919	1919	1914
Number of establishments [1]	20	81	15	17	2	3	1	1	1
Number manufacturing:									
Straight coal gas	1		6	7	2	3			
Carbureted water gas	7	8	6	4					
Mixed coal and water gas			2	1					
Oil gas		3					1	1	1
Acetylene	2	14	1	5					
Gasoline (cold-process) gas	10	56							
Number operating gas and electric light and power plants in conjunction	4	2	3	5		1	1	1	1
Persons engaged	40	88	258	184	19	23	7	7	4
Salaried employees	9	12	24	35	2	6	2	4	2
Wage earners (average number)	31	76	234	149	17	17	5	3	2
Primary horsepower	1,203	975	853	746	2	14	90	20	30
Capital	$630,922	$481,042	$3,300,341	$3,089,083	$228,000	$223,948	$65,000	$47,946	$49,637
Salaries and wages	$39,127	$38,531	$325,616	$134,009	$13,660	$13,804	$5,990	$5,015	$3,408
Salaries	$8,287	$3,928	$36,135	$29,514	$2,070	$4,233	$1,050	$2,192	$1,008
Wages	$30,840	$34,603	$289,481	$104,495	$11,590	$9,571	$4,940	$2,823	$2,400
Cost of materials	$87,968	$150,584	$760,355	$300,399	$22,869	$13,796	$18,177	$12,929	$4,115
Value of products	$137,798	$217,230	$1,532,095	$887,736	$43,128	$38,829	$42,356	$23,789	$14,495
Value added by manufacture [2]	$49,830	$66,646	$771,740	$587,337	$20,259	$25,033	$24,179	$10,860	$10,380
MATERIALS.									
Total cost	$87,968	$150,584	$760,355	$300,399	$22,869	$13,796	$18,177	$12,929	$4,115
Coal used for gas making:									
Net tons	1,670		22,247	43,805	3,310	3,638			
Cost	$11,816		$129,074	$123,621	$17,260	$11,773			
Coke, purchased, used for gas making:									
Net tons	1,308	1,155	4,092	2,135					
Cost	$12,527	$6,583	$46,738	$10,890					
Oil used for gas making and enriching:									
Gallons	292,706	229,618	3,500,710	2,429,057			216,000	277,800	147,546
Cost	$34,218	$9,773	$276,183	$125,939			$14,476	$9,692	$2,944
Gasoline for gas making:									
Gallons	42,401	592,992							
Cost	$14,926	$101,813							
Calcium carbide:									
Pounds	26,400	476,875	24,000	192,000					
Cost	$1,404	$15,260	$1,320	$6,166					
Fuel for boilers and retorts, cost	$7,154	$8,066	$10,678	$15,406		$50			
Amount paid for lamps and appliances, purchased for sale		$701	$33,996	$7,104	$1,224	$422			
All other materials, cost	$5,923	$8,298	$262,366	$11,273	$4,385	$1,551	$3,701	$3,237	$1,171
PRODUCTS.									
Total value	$137,798	$217,230	$1,532,095	$887,736	$43,128	$38,829	$42,356	$23,789	$14,495
Gas:									
M cubic feet	82,019	142,617	1,358,119	941,338	26,108	41,137	21,178	16,418	13,624
Value	$134,051	$215,173	$1,408,715	$806,335	$32,662	$31,743	$42,356	$23,789	$13,864
Straight coal gas—									
M cubic feet	13,260		189,943	166,701	26,108	41,137			
Value	$19,888		$204,974	$161,034	$32,662	$31,743			
Carbureted water gas—									
M cubic feet	58,192	29,205	172,022	111,556					
Value	$90,712	$41,047	$235,209	$61,730					
Mixed coal and water gas—									
M cubic feet			995,923	661,985					
Value			$966,223	$571,487					
Oil gas—									
M cubic feet		8,571					21,178	16,418	13,624
Value		$14,259					$42,356	$23,789	$13,864
Acetylene—									
M cubic feet	133	1,783	231	1,096					
Value	$1,818	$19,517	$2,309	$12,084					
Gasoline (cold-process) gas—									
M cubic feet	10,434	103,058							
Value	$21,633	$140,350							
Coke:									
For sale—									
Net tons			6,846	12,626	1,138	1,476			
Value			$35,230	$45,275	$6,733	$4,322			
Made and consumed, tons	3,325		30,878		386				
Tar:									
Gallons			881,267	788,025	40,379	42,100			
Value			$29,021	$22,751	$2,417	$1,934			
All other products, value	$558	$151	$7,257	$3,829	$92				$360
Receipts from rents and sales of lamps and appliances	$3,189	$1,906	$51,872	$9,546	$1,224	$830			$271
MAINS.									
Miles of mains	87	259	371	334	24	27	14	17	14

[1] Distribution, by states:
West North Central, 1919—Minnesota, 7 establishments; Iowa, 8; North Dakota, 1; South Dakota, 2; Nebraska, 2; 1914—Minnesota, 28; Iowa, 34; North Dakota, 1; South Dakota, 5; Nebraska, 11; Kansas, 2.
South Atlantic, 1919—Maryland, 1 establishment; Virginia, 5; Georgia, 4; Florida, 2; North Carolina, 3; 1914—Maryland, 1; Virginia, 7; West Virginia, 1; South Carolina, 1; Georgia, 5; Florida., 2.
East South Central, 1919—Kentucky, 1 establishment; Alabama, 1; 1914—Kentucky., 1; Alabama, 2.

[2] Value of products less cost of materials.

GENERAL TABLES.

Table 30 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 31 is a detailed statement, by states, for the census of 1919.

TABLE 30.—COMPARATIVE SUMMARY, BY STATES: 1919, 1914, AND 1909.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	1,022	42,908	238,467	$52,759	$157,551	$329,279
	1914	1,284	43,792	215,715	26,802	76,779	220,238
	1909	1,296	37,215	128,350	20,931	52,428	166,814
Alabama	1919	12	522	333	544	762	1,646
	1914	14	214	461	129	387	1,125
	1909	13	259	599	133	214	687
Arizona	1919	9	63	590	85	350	691
	1914	9	59	646	41	90	267
	1909	8	20	153	20	47	137
California	1919	57	2,444	24,545	2,754	8,000	20,441
	1914	66	2,317	22,054	2,023	3,422	13,578
	1909	74	1,666	7,502	1,408	2,604	8,927
Colorado	1919	10	448	736	565	1,001	2,649
	1914	8	387	1,379	303	562	1,588
	1909	10	306	646	191	636	1,472
Connecticut	1919	22	1,270	3,071	1,087	3,190	8,347
	1914	27	1,209	5,089	827	1,471	4,746
	1909	28	926	4,100	557	1,005	3,446
Delaware	1919	7	145	167	186	449	1,053
	1914	8	125	158	75	205	570
	1909	5	128	333	76	109	364
Florida	1919	14	418	1,074	422	983	1,989
	1914	14	349	968	183	338	1,049
	1909	12	210	746	113	182	585
Georgia	1919	17	486	1,344	499	1,519	3,005
	1914	19	560	1,999	279	653	2,021
	1909	15	459	689	206	368	1,425
Idaho	1919	4	35	402	41	90	241
	1914	4	44	224	32	52	171
	1909	3	35	27	27	52	113
Illinois	1919	70	4,430	21,912	5,372	17,892	36,930
	1914	75	3,890	31,058	2,659	8,035	28,171
	1909	78	6,301	18,385	2,967	6,210	21,052
Indiana	1919	53	1,002	8,378	2,138	6,612	12,454
	1914	60	1,668	3,707	958	2,611	6,398
	1909	53	928	5,845	508	1,102	3,147
Iowa	1919	68	727	5,316	846	2,641	5,738
	1914	113	768	5,394	497	1,638	4,066
	1909	117	806	2,043	380	1,111	2,893
Kansas	1919	7	52	557	64	155	400
	1914	12	62	1,544	37	66	225
	1909	12	36	275	22	57	208
Kentucky	1919	10	90	312	74	160	340
	1914	13	232	1,178	131	190	589
	1909	15	386	991	206	315	1,004
Maine	1919	13	220	463	267	647	1,381
	1914	17	220	490	152	292	769
	1909	19	216	349	120	212	549
Maryland	1919	16	875	2,831	1,272	2,858	6,448
	1914	18	1,234	1,677	398	1,405	4,157
	1909	18	476	1,555	220	629	3,223
Massachusetts	1919	51	2,654	18,827	3,557	10,774	24,231
	1914	61	3,182	11,462	2,141	5,951	15,752
	1909	64	2,292	7,371	1,250	3,810	11,074
Michigan	1919	59	2,846	13,593	3,965	8,270	17,993
	1914	59	2,349	4,935	1,584	3,356	10,441
	1909	55	1,771	6,055	1,096	2,129	6,748
Minnesota	1919	23	707	5,908	869	2,408	5,518
	1914	47	1,038	4,670	646	1,681	4,159
	1909	42	848	3,538	292	820	2,874
Mississippi	1919	7	122	228	100	204	411
	1914	8	113	196	56	111	292
	1909	8	101	148	39	86	256
Missouri	1919	26	1,318	8,772	1,539	2,996	11,113
	1914	35	1,342	16,351	844	2,143	7,197
	1909	29	941	3,635	636	1,223	4,638
Montana	1919	6	63	170	$99	$197	$487
	1914	6	59	172	58	95	266
	1909	5	48	129	41	77	190
Nebraska	1919	20	291	1,639	328	1,134	2,446
	1914	48	354	1,620	227	606	1,928
	1909	48	400	1,015	209	445	1,415
New Hampshire	1919	13	209	298	228	529	1,195
	1914	14	244	513	147	324	842
	1909	14	247	220	106	180	581
New Jersey	1919	38	2,083	14,757	2,375	7,375	20,317
	1914	43	2,205	10,397	761	4,075	14,020
	1909	47	1,917	6,717	853	2,855	9,837
New York	1919	96	8,409	54,291	10,898	41,170	69,339
	1914	131	10,090	44,637	5,927	21,560	52,816
	1909	141	6,422	30,089	4,364	15,018	42,347
North Carolina	1919	22	341	1,086	329	677	1,521
	1914	20	210	705	102	252	716
	1909	14	151	308	62	123	369
North Dakota	1919	5	43	66	69	155	384
	1914	9	52	65	29	109	273
	1909	6	28	52	13	78	199
Ohio	1919	15	162	822	225	358	887
	1914	25	398	1,353	262	480	1,432
	1909	38	666	2,165	431	827	3,080
Oregon	1919	11	334	1,910	353	818	2,927
	1914	9	385	2,482	310	404	1,528
	1909	8	260	1,483	194	200	909
Pennsylvania	1919	86	3,324	16,671	4,241	17,330	31,598
	1914	99	2,796	12,552	1,420	6,440	16,745
	1909	99	3,119	9,374	1,501	4,099	15,840
Rhode Island	1919	4	670	2,335	834	2,073	4,478
	1914	6	605	1,731	477	884	2,462
	1909	8	412	719	303	530	1,833
South Carolina	1919	10	219	950	195	474	947
	1914	12	136	509	68	169	496
	1909	12	127	207	52	114	334
South Dakota	1919	12	80	473	83	320	613
	1914	17	80	651	57	136	380
	1909	17	108	318	64	120	278
Tennessee	1919	10	474	1,868	421	841	1,801
	1914	12	506	655	292	518	1,571
	1909	11	422	613	164	357	1,282
Texas	1919	25	643	3,622	628	1,587	3,614
	1914	27	613	1,759	354	768	2,185
	1909	27	575	1,090	288	545	1,644
Utah	1919	4	172	638	196	295	790
	1914	4	208	720	141	279	617
	1909	3	167	291	108	168	366
Vermont	1919	9	87	136	90	222	486
	1914	9	59	1,543	32	122	337
	1909	9	70	153	43	100	278
Virginia	1919	17	475	1,875	667	1,457	3,150
	1914	22	533	1,488	306	750	2,150
	1909	21	378	1,116	217	431	1,472
Washington	1919	12	637	2,969	838	1,606	3,680
	1914	13	630	2,568	487	759	2,369
	1909	12	465	1,479	273	661	1,684
Wisconsin	1919	34	1,294	7,869	1,556	3,575	8,153
	1914	47	1,240	11,159	722	1,816	5,295
	1909	49	1,063	3,278	583	1,389	4,001
All other states	1919	18	1,124	4,663	1,269	3,397	7,447
	1914	24	1,027	2,796	628	1,574	4,479
	1909	29	1,059	2,549	595	1,190	4,053

TABLE 31.—DETAILED STATEMENT,

	STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male.	Capital.
															Dollars.
1	United States	1,022	63,328	27	3,424	11,088	5,881	42,908	De 44,280	Mh 41,549	44,280	44,058	200	22	1,465,656,265
2	Alabama	12	568	.....	18	19	9	522	De 558	My 496	558	558	.....	.....	7,575,500
3	Arizona	9	122	.....	19	27	13	63	Fe 66	Oc 60	60	60	.....	.....	1,613,634
4	California	57	3,721	1	167	769	340	2,444	No 2,851	Fe 2,079	2,705	2,702	2	1	62,207,518
5	Colorado	10	528	.....	31	36	13	448	De 521	Fe 404	521	521	.....	.....	10,973,023
6	Connecticut	22	1,785	.....	109	224	182	1,270	Au 1,331	No 1,229	1,249	1,225	16	8	27,214,357
7	Delaware	7	219	1	21	33	19	145	Au 160	My 133	141	140	1	.....	7,728,319
8	Florida	14	509	.....	38	35	18	418	Ja 456	Je 392	439	439	.....	.....	10,850,130
9	Georgia	17	668	1	47	86	43	486	De 541	Ja 436	496	495	1	.....	11,103,421
10	Idaho	4	58	.....	12	7	4	35	De 40	Fe 31	39	39	.....	.....	1,981,979
11	Illinois	70	7,737	.....	282	1,972	1,053	4,430	Ja 4,986	Ap 4,258	4,479	4,435	44	.....	172,854,890
12	Indiana	53	2,038	1	147	329	254	1,902	Au 1,987	My 1,786	1,836	1,830	6	.....	32,999,981
13	Iowa	68	1,052	1	101	135	88	727	De 750	Fe 696	816	813	3	.....	20,600,750
14	Kansas	7	79	.....	14	9	4	52	Se 56	No 48	51	51	.....	.....	1,402,948
15	Kentucky	10	118	.....	15	6	7	90	Au 105	Ap 81	89	89	.....	.....	1,981,327
16	Maine	13	309	.....	32	33	24	220	No 245	Jy 204	218	214	3	1	4,431,373
17	Maryland	16	1,505	4	57	385	184	875	Oc [1] 988	Mh 738	959	956	3	.....	34,832,759
18	Massachusetts	51	3,314	.....	204	179	277	2,654	Ja 2,739	Se 2,424	2,612	2,608	.....	4	77,030,109
19	Michigan	59	4,044	2	208	362	626	2,846	De 3,275	Fe 2,387	3,286	3,282	4	.....	60,125,709
20	Minnesota	23	1,028	.....	73	157	91	707	Je 783	Fe 632	734	727	7	.....	21,461,659
21	Mississippi	7	160	.....	15	10	13	122	De 133	Mh 106	134	134	.....	.....	1,190,879
22	Missouri	26	1,866	1	106	185	256	1,318	Ja 1,419	Je 1,265	1,307	1,302	5	.....	51,942,192
23	Montana	6	89	.....	9	14	3	63	Au 68	Mh 59	63	63	.....	.....	1,815,946
24	Nebraska	20	451	1	43	77	39	291	De 323	Fe 250	324	324	.....	.....	12,476,927
25	New Hampshire	13	302	.....	33	35	25	209	Se 227	Ja 190	219	212	7	.....	3,551,515
26	New Jersey	38	3,859	.....	188	1,219	369	2,083	Ja 2,303	Ap 1,924	2,073	2,065	8	.....	105,766,467
27	New York	96	12,766	3	599	2,934	821	8,409	Ja 8,636	Se 8,076	8,440	8,380	60	.....	447,549,070
28	North Carolina	22	417	.....	34	22	20	341	Je 384	Oc 322	332	332	.....	.....	6,617,981
29	North Dakota	5	69	.....	9	14	3	43	Oc 51	Mh [2] 37	43	43	.....	.....	1,005,972
30	Ohio	15	221	.....	31	12	16	162	Ja 175	De 152	154	153	1	.....	6,500,838
31	Oregon	11	540	.....	36	98	72	334	De 414	Ja 261	414	414	.....	.....	14,549,796
32	Pennsylvania	86	4,823	2	246	900	351	3,324	Ja 3,532	No 3,223	3,360	3,350	9	1	91,878,192
33	Rhode Island	4	906	.....	47	68	121	670	Ja 1,001	Au 508	586	582	2	2	15,592,065
34	South Carolina	10	303	.....	33	30	21	219	Mh 224	Fe 215	223	223	.....	.....	2,511,189
35	South Dakota	12	124	7	14	11	12	80	Se 90	Ja [2] 68	80	80	.....	.....	1,834,545
36	Tennessee	10	544	.....	36	34	.....	474	Jy [2] 487	Fe 461	475	475	.....	.....	13,546,480
37	Texas	25	876	1	62	108	62	643	De 693	Je 597	688	685	2	1	15,404,524
38	Utah	4	236	.....	11	32	21	172	Je 201	Ap 141	177	177	.....	.....	6,566,099
39	Vermont	9	137	.....	26	12	12	87	Je [2] 95	Fe [2] 81	84	84	.....	.....	2,015,227
40	Virginia	17	583	.....	38	29	41	475	Ja 532	Ap 443	496	496	.....	.....	9,800,819
41	Washington	12	858	.....	38	104	79	637	Oc 772	Fe 533	760	760	.....	.....	23,986,656
42	Wisconsin	34	1,749	1	104	155	195	1,294	Jy 1,351	Fe 1,174	1,304	1,297	5	2	32,382,014
43	All other states [4]	18	1,457	.....	71	182	80	1,124	.....	.....	1,256	1,243	11	2	27,701,486

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

BY STATES: 1919.

EXPENSES.										POWER.							
Salaries and wages.			For contract work.	Rent and taxes.		For materials.		Value of products.	Value added by manufacture.	Primary horsepower.						Electric horsepower generated in establishments reporting.	
											Owned.						
Officials.	Clerks, etc.	Wage earners.		Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.			Total.	Steam engines (not turbines.)	Steam turbines.	Internal-combustion engines.	Water power.[1]	Rented.[2]		
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*								
8,299,422	16,873,031	52,758,628	463,280	4,062,677	18,826,338	42,638,896	114,911,986	320,278,908	171,728,026	238,467	148,393	48,928	7,574	196	33,376	22,040	1
42,113	34,571	544,427	1,846	900	88,455	127,474	634,281	1,646,047	884,292	333	296	.....	.....	.....	37	.....	2
18,492	47,179	84,651	.....	.....	29,542	92,414	257,513	691,169	341,242	590	240	170	50	.....	130	18	3
493,049	1,152,856	2,754,113	.....	300	1,325,762	1,723,896	6,276,167	20,440,682	12,440,619	24,545	6,702	1,811	452	.....	15,580	152	4
69,313	49,074	565,366	1,306	1,440	41,396	112,447	888,368	2,649,135	1,648,320	736	505	37	25	.....	169	300	5
283,587	360,028	1,687,091	5,785	13,846	565,502	547,692	2,641,922	8,346,845	5,157,231	3,071	1,861	695	.....	.....	515	1,726	6
51,976	40,980	186,037	393½	.....	36,553	76,818	372,305	1,053,011	603,888	167	145	20	2	.....	.....	.....	7
84,447	64,168	421,893	125½	675	92,982	309,671	673,279	1,989,238	1,006,288	1,074	789	265	20	.....	.....	100	8
101,385	123,342	498,461	.....	600	167,585	322,205	1,197,035	3,005,168	1,485,928	1,344	979	30	.....	.....	335	18	9
11,753	10,493	40,504	1,825	.....	10,051	20,639	69,578	240,702	150,485	402	402	.....	.....	.....	.....	.....	10
780,539	3,265,556	5,372,255	164,478	347,309	1,492,615	3,178,894	14,713,268	36,930,423	19,038,261	21,912	14,869	6,187	226	.....	630	1,133	11
281,379	429,410	2,137,557	4,966	397,464	536,334	1,593,628	5,018,043	12,454,206	5,842,535	8,378	3,596	225	175	.....	4,382	178	12
184,472	217,506	846,497	.....	10,080	324,981	874,171	1,767,102	5,737,627	3,096,354	5,316	3,927	545	147	1	696	1,103	13
20,713	12,340	63,529	600	149	19,092	56,257	98,530	400,196	245,409	557	490	15	.....	.....	52	3	14
16,880	10,716	73,803	.....	.....	13,385	42,302	117,622	330,844	179,920	312	261	.....	.....	.....	51	.....	15
63,710	56,216	266,584	7,760	.....	59,243	138,455	508,620	1,380,930	733,855	463	185	177	16	.....	85	.....	16
170,311	566,023	1,272,374	2,574	1,363	482,558	589,524	2,268,793	6,447,980	3,589,663	2,831	1,291	1,499	26	.....	15	.....	17
458,483	497,024	3,557,468	.....	3,073	1,788,328	1,907,331	8,866,233	24,231,095	13,457,531	18,827	9,958	5,880	25	12	2,952	2,059	18
503,947	1,139,831	3,965,259	6,510	1,520	1,247,040	2,514,834	5,755,498	17,993,314	9,722,982	13,593	10,479	1,037	1,272	.....	805	3,149	19
204,349	254,398	868,656	.....	2,300	308,655	658,994	1,748,827	5,517,882	3,110,061	5,908	3,024	2,330	125	.....	429	256	20
22,535	16,293	99,945	100	3,420	16,174	37,254	166,717	411,344	207,373	228	167	.....	.....	.....	61	.....	21
208,075	382,698	1,539,087	415	3,082	617,828	553,571	2,442,547	11,113,372	8,117,254	8,772	4,210	3,253	992	.....	317	2,999	22
22,857	22,279	98,570	.....	.....	28,556	42,906	154,293	486,767	289,568	170	170	.....	.....	.....	.....	12	23
89,679	125,124	327,894	16,055	1,460	173,700	272,438	861,895	2,445,794	1,311,461	1,639	841	305	79	1	413	.....	24
53,932	49,912	227,764	.....	1,468	74,586	102,684	426,335	1,194,779	665,760	298	217	.....	.....	.....	81	.....	25
375,623	1,081,607	2,374,544	776	830	272,595	2,428,382	4,946,315	20,317,305	12,942,608	14,757	11,133	1,841	1,774	1	8	390	26
1,857,367	3,783,375	10,897,701	150,842	30,599	5,768,757	11,772,134	29,397,975	69,339,351	28,109,242	54,291	44,899	8,260	449	1	682	1,252	27
58,938	42,085	329,355	435	1,620	52,899	178,526	498,964	1,521,490	844,000	1,086	522	223	.....	180	161	45	28
17,279	15,019	60,076	845	1,342	13,688	7,373	147,836	354,467	220,258	66	56	10	.....	.....	.....	.....	29
47,475	27,576	225,483	1,416	1,692	85,618	82,978	274,820	887,298	529,500	822	707	.....	110	.....	5	.....	30
77,185	193,621	353,324	.....	635	231,122	214,568	603,907	2,927,374	2,108,899	1,910	293	1,540	.....	.....	77	2,089	31
570,633	1,384,168	4,240,772	170	3,212,869	627,295	8,951,978	8,377,993	31,598,131	14,268,160	16,671	8,009	7,280	928	.....	454	3,837	32
143,103	180,461	834,074	.....	.....	247,219	186,944	1,886,093	4,477,592	2,404,555	2,335	1,215	385	.....	.....	735	189	33
48,155	43,269	194,905	350	1,143	51,828	92,463	381,987	946,732	472,282	950	676	107	125	.....	42	151	34
31,875	24,827	82,866	.....	1,662	19,977	64,952	254,795	613,376	293,629	473	367	15	58	.....	33	.....	35
75,946	77,783	420,788	.....	440	161,478	133,521	707,233	1,800,579	959,825	1,868	680	133	15	.....	1,040	4	36
135,811	161,087	627,976	28,324	5,784	211,523	346,899	1,239,910	3,613,995	2,027,186	3,622	1,887	1,194	125	.....	416	.....	37
28,220	50,226	196,050	.....	10,151	56,907	81,715	213,154	789,889	495,020	638	401	86	.....	.....	151	.....	38
31,964	16,696	89,914	822	2,407	14,943	63,203	158,804	485,751	263,744	136	95	15	.....	.....	26	55	39
74,864	86,822	667,166	9,586	5	88,665	139,997	1,316,630	3,149,476	1,692,849	1,875	1,044	556	.....	.....	275	50	40
94,046	197,016	838,340	2,762	124	291,828	506,043	1,099,923	3,680,464	2,074,498	2,969	1,455	630	286	.....	598	349	41
222,386	322,362	1,556,142	52,214	.....	704,144	1,179,351	2,395,945	8,152,860	4,577,564	7,869	6,770	1,045	32	.....	22	373	42
170,576	257,014	1,269,367	.....	925	384,949	311,370	3,084,931	7,445,228	4,048,927	4,663	2,580	1,127	40	.....	916	50	43

[1] Same number reported for one or more other months.
[2] All other states embrace: Arkansas 1, establishment; District of Columbia, 2; Louisiana, 4; Nevada, 2; New Mexico, 2; Oklahoma, 2; West Virginia, 3; and Wyoming, 2.

NATURAL DYESTUFFS AND EXTRACTS.

GENERAL STATISTICS.

General character of the industry.—The census classification covers establishments engaged primarily in the manufacture of natural dyestuffs as distinguished from the artificial or synthetic dyes, that is, from forest products, woods, barks, berries, etc., and also tanning extracts and liquors, including chrome tanning solutions, and mordants, assistants and sizes.

Comparative summary.—Table 1 presents the general statistics for the census years 1879 to 1919, inclusive. At prior censuses the industry included the artificial dyestuffs and mineral colors and dyes. The manufacture of artificial dyestuffs, however, chiefly concerns the coal-tar products industry and establishments engaged in the manufacture of coal-tar dyes are included therein, although at prior censuses they were not segregated from the natural dyestuffs and extracts. At the census of 1869 the industry was represented by 73 establishments with products valued at $2,878,609.

Principal states, ranked by value of products.—The general statistics are presented in Table 2, by states, ranked according to value of products. It is largely centered in the Atlantic and Eastern states, 70 per cent of the production being reported by Atlantic Coast states.

Persons engaged in the industry.—The age classification of the average number of wage earners as shown in Table 3 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 15.

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 fluctuation in number of wage earners per month is relatively small. The females employed as wage earners constituted but 1.7 per cent of the total number.

Prevailing hours of labor.—The statistics presented in Table 5 show a reduction in the hours of labor per week, though the movement is not as pronounced as in some of the other industries. In 1909, 77.3 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were "60 or over." In 1914 the proportion was 73.4 per cent, and in 1919 it dropped to 65.2 per cent. On the other hand, in 1909 only 5.7 per cent were employed in establishments where the hours were fewer than 54 per week, and the percentage for this group increased to 9.1 per cent in 1914, and to 17.4 per cent in 1919.

Size of establishments, by average number of wage earners.—The industry is one of relatively small units, see Table 6, the average number of wage earners per establishment being 30 in 1919, 25 in 1914, and 22 in 1909. In 1919 the establishments employing over 100 wage earners were 14 in number, with 48.6 per cent of the wage earners; and in 1914 there were 6 with 30. 9 per cent.

Size of establishments, by value of products.—The grouping by value of products, as shown in Table 7, reflects the general increase in values. The average value of products per establishment increased from $111,000 in 1904 to $149,000 in 1909, to $184,000 in 1914, and to $373,000 in 1919. The ratios of value of product per wage earner at the several censuses is an index of increase in values. This ratio in 1909 was $6,656 per wage earner, in 1914 $7,263, and in 1919 it averaged $12,378. This increase in values accounts in the main for the changes from lower to higher groups.

Character of ownership.—The preponderance of corporate ownership is shown in Table 8. The establishments owned by corporations employed 95.8 per cent of all wage earners and reported 92.5 per cent of the value of products in 1919 as compared with 92.1 per cent and 91.4 per cent, respectively, in 1914, and 89.7 per cent and 91.2 per cent in 1909.

Number and horsepower of types of prime movers.—Table 9 presents the statistics concerning power. The total horsepower reported in 1919 shows an increase of 11,030 horsepower, or 47.4 per cent, over that reported for 1914. This increase, however, is largely in rented power, which constituted 7.9 per cent of the primary power in 1919 and 3.2 per cent in 1914. The total electric power as utilized in 1919, including electric motor equipment operated with purchased current, specified as rented, and secondary electric or that generated by the establishment, constituted 24.3 per cent of the primary power in 1919 as compared with 11.8 per cent in 1914 and 7.5 per cent in 1909.

Fuel consumed.—Table 10 presents the statistics for fuel consumed, by kinds of fuel, for 1919, 1914, and 1909, and by states for 1919.

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	144	112	107	98	77	62	41	28.6	4.7	.....	.....	.....	.....
Persons engaged	5,205	3,551	3,015	3,150	(2)	(2)	(2)	46.6	17.8	−4.3	.....	.....	.....
Proprietors and firm members	59	56	65	82	(2)	(2)	(2)	.....	.....	.....	.....	.....	.....
Salaried employees	804	656	553	361	229	(2)	(2)	22.6	18.6	53.2	57.6	.....	.....
Wage earners (average number)	4,342	2,839	2,397	2,707	1,647	2,111	992	52.9	18.4	−11.5	64.4	(3)	(3)
Primary horsepower	34,320	23,290	22,213	17,671	11,409	11,896	(2)	47.4	4.8	25.7	54.9	−4.1	.....
Capital	$38,689,058	$21,283,974	$17,934,545	$14,904,150	$7,839,034	$8,645,458	$2,363,700	81.8	18.7	20.3	90.1	−9.3	265.8
Salaries and wages	7,055,528	3,001,959	2,233,705	1,873,282	1,100,051	1,289,987	512,097	135.0	34.4	19.2	70.3	−14.7	151.9
Salaries	2,320,914	1,388,843	942,326	608,790	312,109	252,336	(2)	67.1	47.4	54.8	95.1	23.7	.....
Wages	4,734,614	1,613,116	1,291,379	1,264,492	787,942	1,037,651	(2)	193.5	24.9	2.1	60.5	−24.1	.....
Paid for contract work	225,880	2,487	4,738	2,675	(2)	(2)	(2)	8,982.4	−47.5	77.1	.....	.....	.....
Rent and taxes	2,521,380	225,582	106,415	[4] 77,639	(2)	(2)	(2)	1,017.7	112.0	.....	.....	.....	.....
Cost of materials	34,592,698	13,237,995	9,683,651	6,829,340	4,745,912	6,500,928	3,918,741	161.3	36.7	41.8	43.9	−27.0	65.9
Value of products	53,744,283	20,620,336	15,954,574	10,893,113	7,350,748	9,292,514	5,253,038	160.6	29.2	46.5	48.2	−20.9	76.9
Value added by manufacture[5]	19,151,585	7,382,341	6,270,923	4,063,773	2,604,836	2,791,586	1,334,297	159.4	17.7	54.3	56.0	−6.7	109.2

[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.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	144	4,342	100.0	....	$53,744	100.0	....	$19,152	100.0	...
New York	27	593	13.7	3	9,561	17.8	1	3,628	18.9	3
Virginia	17	1,002	23.1	2	9,426	17.5	2	4,493	23.4	1
Tennessee	10	1,037	23.8	1	7,562	14.1	3	3,889	20.3	2
New Jersey	17	385	8.9	5	5,924	11.0	4	2,375	12.4	4
Massachusetts	27	165	3.8	7	$5,811	10.8	5	$1,336	7.0	5
Pennsylvania	12	426	9.8	4	3,800	7.1	7	938	4.9	6
North Carolina	5	335	7.7	6	2,444	4.6	8	782	4.1	7
Rhode Island	14	66	1.5	10	1,024	1.9	10	358	1.9	10
All other states	15	333	7.7	....	8,192	15.2	....	1,353	7.1	...

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	5,205	4,950	255	95.1	4.9
	1914	3,551	3,402	149	95.8	4.2
	1909	3,015	2,901	114	96.2	3.8
Proprietors and officials	1919	418	408	10	97.6	2.4
	1914	270	262	8	97.0	3.0
	1909	264	262	2	99.2	0.8
Proprietors and firm members	1919	59	55	4	93.2	6.8
	1914	56	50	6	89.3	10.7
	1909	65	64	1	98.5	1.5
Salaried officers of corporations	1919	142	137	5	96.5	3.5
	1914	103	102	1	99.0	1.0
	1909	91	91	.....	100.0	.....
Superintendents and managers	1919	217	216	1	99.5	0.5
	1914	111	110	1	99.1	0.9
	1909	108	107	1	99.1	0.9
Clerks and other subordinate salaried employees	1919	445	274	171	61.6	38.4
	1914	442	330	112	74.7	25.3
	1909	354	278	76	78.5	21.5
Wage earners (average number)	1919	4,342	4,268	74	98.3	1.7
	1914	2,839	2,810	29	99.0	1.0
	1909	2,397	2,361	36	98.5	1.5
16 years of age and over	1919	4,328	4,259	69	98.4	1.6
	1914	2,823	2,796	27	99.0	1.0
	1909	2,391	2,355	36	98.5	1.5
Under 16 years of age	1919	14	9	5	64.3	35.7
	1914	16	14	2	87.5	12.5
	1909	6	6	.....	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 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	4,342	4,278	4,285	4,165	*4,103*	4,214	4,336	4,511	4,472	4,454	4,360	4,488	4,438	91.0
Males	4,268	4,208	4,215	4,095	*4,034*	4,146	4,261	4,427	4,392	4,376	4,291	4,417	4,354	91.1
Females	74	70	70	70	69	*68*	75	84	80	78	69	71	84	81.0
1914	2,839	2,719	*2,662*	2,779	2,838	2,848	2,849	2,798	2,785	2,917	2,989	2,967	2,917	89.1
1909	2,397	*2,293*	2,351	2,351	2,436	2,344	2,399	2,432	2,478	2,453	2,324	2,450	2,439	92.5
Massachusetts	165	152	149	130	*127*	148	176	175	180	182	182	185	194	65.5
New Jersey	385	370	348	337	*332*	*332*	339	376	409	426	437	460	454	72.2
New York	593	549	560	574	545	*534*	*534*	577	578	602	636	684	743	71.9
North Carolina	335	363	360	349	367	360	363	367	373	356	258	263	*241*	64.6
Pennsylvania	426	433	444	453	406	*391*	403	398	417	416	435	463	453	84.4
Rhode Island	66	64	*57*	61	*57*	61	60	65	65	71	72	78	81	70.4
Tennessee	1,037	*981*	1,048	1,004	1,020	1,027	1,103	1,120	1,066	1,041	991	1,060	983	87.6
Virginia	1,002	1,015	1,010	974	*925*	1,000	1,015	1,060	1,044	1,015	1,015	983	968	87.3

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

STATE.	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.	4,342	166	193	267	129	363	392	1,535	1,297
1914.	2,839	(2)	(2)	85	173	46	452	1,311	772
1909.	2,397	(2)	(2)	97	39	58	351	1,361	491
Massachusetts	165	38	5	42	34	9	32	5	.....
New Jersey	385	11	55	14	43	7	182	8	65
New York	593	32	38	69	40	140	4	166	104
North Carolina	335	71	.....	.....	.....	.....	.....	230	34
Pennsylvania	426	8	.....	4	6	33	.....	58	317
Rhode Island	66	5	.....	3	6	10	42	.....	.....
Tennessee	1,037	.....	.....	.....	.....	150	62	453	372
Virginia	1,002	.....	95	125	.....	.....	.....	546	236

[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 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		Over 250 wage earners.	
			Establishments.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States...1919..	144	4,342	9	59	161	29	291	15	510	18	1,268	13	1,836	1	276
1914..	112	2,839	4	37	86	33	383	20	662	12	832	6	876	.....	.....
Massachusetts	27	165	2	18	58	5	49	2	58	.....	.....	.....	.....	.....	.....
New Jersey	17	385	1	4	15	8	82	2	53	1	65	1	170	.....	.....
New York	27	593	2	12	28	7	75	3	92	.....	.....	3	398	.....	.....
North Carolina	5	335	.....	1	2	.....	.....	1	34	2	156	1	143	.....	.....
Pennsylvania	12	426	1	5	12	2	17	3	121	.....	.....	.....	.....	1	276
Rhode Island	14	66	3	9	22	1	9	1	35	.....	.....	.....	.....	.....	.....
Tennessee	10	1,037	.....	.....	.....	.....	.....	.....	.....	7	509	3	528	.....	.....
Virginia	17	1,002	.....	4	17	2	23	.....	.....	7	487	4	475	.....	.....

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	144	112	107	4,342	2,839	2,397	$53,744,283	$20,620,336	$15,954,574	$19,151,585	$7,382,341	$6,270,923
Less than $5,000	5	6	10	1	3	12	11,056	11,372	25,838	4,803	6,264	15,571
$5,000 to $20,000	17	19	19	32	49	66	198,366	216,921	240,409	85,074	110,230	105,736
$20,000 to $100,000	49	37	36	200	308	390	2,521,776	1,860,718	1,892,747	1,052,403	670,451	832,605
$100,000 to $500,000	38	41	42	1,097	2,479	1,929	11,263,383	13,531,325	13,795,580	4,080,641	6,595,396	5,317,011
$500,000 to $1,000,000	24	6		1,488			15,700,228			5,848,609		
$1,000,000 and over	11	3		1,524			24,049,474			8,080,055		
	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	5.4	9.3	(1)	0.1	0.5	(1)	0.1	0.2	(1)	0.1	0.2
$5,000 to $20,000	11.8	17.0	17.8	0.7	1.7	2.8	0.4	1.1	1.5	0.5	1.5	1.7
$20,000 to $100,000	34.0	33.0	33.6	4.6	10.9	16.3	4.7	9.0	11.9	5.5	9.1	13.3
$100,000 to $500,000	26.4	36.6	39.3	25.3	87.3	80.4	21.0	89.8	86.4	21.3	89.3	84.8
$500,000 to $1,000,000	16.7	5.3		34.3			29.2			30.5		
$1,000,000 and over	7.6	2.7		35.1			44.7			42.2		

[1] Less than one-tenth of 1 per cent.

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

STATE.	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.	
	Individuals.	Corporations	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States 1919	38	96	10	4,342	156	4,160	26	3.6	95.8	0.6	$53,744,283	$3,406,538	$49,691,965	$645,780	6.3	92.5	1.2
1914	25	75	12	2,839	143	2,615	81	5.0	92.1	2.9	20,620,336	1,144,266	18,854,821	621,249	5.5	91.4	3.1
1909	23	69	15	2,397	145	2,151	101	6.1	89.7	4.2	15,954,574	946,201	14,558,545	449,828	5.9	91.2	2.8
Massachusetts	12	12	3	165	38	120	7	23.0	72.7	4.2	5,811,567	1,135,937	4,380,598	295,032	19.5	75.4	5.1
New Jersey	2	13	2	385	[1] 28	357	.....	7.3	92.7	.....	5,924,057	[1] 1,004,305	4,919,752	.....	17.0	83.0	.....
New York	6	21	.....	593	23	570	.....	3.9	96.1	.....	9,560,583	317,448	9,243,135	.....	3.3	96.7	.....
Pennsylvania	4	8	.....	426	8	418	.....	1.9	98.1	.....	3,800,246	274,138	3,526,108	.....	7.2	92.8	.....
Rhode Island	9	3	2	66	[1] 56	10	.....	84.8	15.2	.....	1,024,287	[1] 883,054	141,233	.....	86.2	13.8	.....
Tennessee	.....	10	.....	1,037	.....	1,037	.....	.....	100.0	.....	7,561,944	.....	7,561,944	.....	.....	100.0	.....
Virginia	3	13	1	1,002	[1] 17	985	.....	1.7	98.3	.....	9,425,657	[1] 83,686	9,341,971	.....	0.9	99.1	.....
All other states	2	16	2	668	.....	663	[2] 5	.....	99.3	0.7	10,635,942	.....	10,577,224	[2] 58,718	.....	99.4	0.6

[1] Includes the group "All others." [2] Includes the group "Individuals."

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	562	306	270	34,320	23,290	22,213	100.0	100.0	100.0
Owned	268	224	251	31,603	22,543	22,020	92.1	96.8	99.1
Steam [1]	256	218	247	31,289	22,032	21,685	91.2	94.6	97.6
Engines	232	(2)	(2)	28,316	(2)	(2)	82.5	.....	.....
Turbines	24	(2)	(2)	2,973	(2)	(2)	8.7	.....	.....
Internal-combustion engines	9	4	1	201	455	15	0.6	2.0	0.1
Water wheels and turbines	3	2	3	113	56	320	0.3	0.2	1.4
Rented	294	82	19	2,717	747	193	7.9	3.2	0.9
Electric	294	82	19	2,692	745	191	7.8	3.2	0.9
Other	.....	.....	.....	25	2	2	0.1	.....	.....
Electric	539	195	106	8,341	2,750	1,664	100.0	100.0	100.0
Rented	294	82	19	2,692	745	191	32.3	27.1	11.5
Generated by establishments reporting	245	113	87	5,649	2,005	1,473	67.7	72.9	88.5

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

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

STATE.	COAL.		Coke (tons, 2,000 lbs.).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
	Anthracite (tons, 2,240 lbs.).	Bituminous (tons, 2,000 lbs.).				
United States...1919..	13,585	330,092	2,325	3,705	91	148,848
1914..	24,457	173,888	25	227	(1)	187,673
Massachusetts	1,447	4,067	.....	165	.....	643
New Jersey	1,153	10,080	2,227	.....	60	682
New York	8,830	20,879	.....	600	.....	382
North Carolina	.....	36,781	.....	.....	.....	.....
Pennsylvania	398	10,693	5	.....	24	
Rhode Island	33	1,672	93	1,970	.....	
Tennessee	.....	114,715	.....	970	.....	.....
Virginia	1,724	109,292	.....	.....	7	.....
All other states	.....	21,913	.....	.....	.....	146,

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Materials.—Table 11 presents the statistics for the principal materials consumed in the manufacture of natural dyestuffs and extracts in 1919.

TABLE 11.—MATERIALS: 1919.

[Including forest products consumed by tanneries and establishments manufacturing dyestuffs and extracts as subsidiary products, and also including the consumption by tanneries and other establishments manufacturing extracts for their own consumption, as well as the materials consumed by the establishments that constitute the classified industry.]

	Quantity.	Cost.
Total	.....	$47,208,538
The classified industry: Dyestuffs and extracts, natural	.....	34,592,698
Other industries manufacturing natural dyestuffs and tanning extracts for consumption or as subsidiary products	.....	12,615,840
	Tons (2,000 lbs.).	
Forest products	1,559,405	24,161,486
Woods:		
Chestnut	787,498	7,347,284
Spruce	366	6,833
Logwood	54,806	1,943,704
Quebracho	9,228	566,498
Fustic	5,134	215,227
Brazilwoods	3,175	137,360
Barks:		
Hemlock	309,917	5,017,827
Oak or oak and chestnut mixed	261,519	5,076,356
Chestnut-oak	61,155	916,391
Black-oak	10,353	134,117
Sumac leaves	7,832	534,129
Myrobalans	8,354	488,982
Divi-divi	5,200	398,337
Mangrove	2,078	125,750
Gambier	342	92,237
Valonia	303	22,303
All other forest products [1]	32,145	1,138,151
Starch	45,924	4,820,447
Rosin	14,503	2,167,395
Gums other than rosin	85	56,159
	Gallons.	
Castor oil	225,234	356,919
Dyes and extracts purchased for blending, etc.:		
Of coal-tar origin	.....	444,006
Other	.....	890,374
Fuel and rent of power	.....	1,675,726
All other materials	.....	12,636,020

[1] Includes larch, Osage orange, wattle bark, archil, gallnuts, etc.

Table 12 shows the consumption of forest product by states. The figures cover the consumption by a classes of establishments so far as the reports a available.

TABLE 12.—MATERIALS—FOREST PRODUCTS, BY STATES: 1919

STATE.	Tons.	Cost.
Total	1,559,405	$24,161,4
Virginia	422,463	4,946,4
Pennsylvania	218,881	4,892,0
Tennessee	343,126	3,473,0
North Carolina	184,124	2,189,4
New York	34,056	1,306,3
Massachusetts	34,351	776,0
New Jersey	15,899	621,9
All other states	306,505	5,055,6

The principal forest products consumed in Virgini were chestnut-oak bark, chestnut wood, and logwood in Pennsylvania, hemlock and black-oak bark, log wood, fustic, Brazilwoods, mangrove, myrobalans quebracho, sumac, and valonia; in Tennessee, chestnu wood and hemlock bark; in North Carolina, chestnu wood and bark; in New York, logwood, quebracho spruce, and sumac; in Massachusetts, Brazilwoods myrobalans, divi-divi, sumac, and gambier; and i New Jersey, logwood, fustic, Brazilwoods, and gambier

Products.—Table 13 presents the statistics fo products in 1919 in comparison with 1914 and 1909 Dyestuffs and extracts made by dye and print work or by tanneries for their own consumption are no included. Figures therefor are not available.

TABLE 13.—PRODUCTS: 1919, 1914, AND 1909.

[Not including tanning extracts made and consumed in establishment producing.]

	1919	1914	1909
Number of establishments	176	133	124
The classified industry: Dyestuffs and extracts, natural	144	112	107
Other industries	32	21	17
PRODUCTS.			
Total value	$56,905,553	[1] $21,382,689	[1] $16,788,676
The classified industry: Dyestuffs and extracts, natural	$53,744,283	$20,620,336	$15,954,574
Subsidiary products from other industries	$3,161,270	$762,353	$834,102
Dyestuffs:			
Natural dyestuffs	$4,699,111	$1,862,162	$1,135,694
Dyewood extracts—			
Logwood—			
Number of establishments	[2] 10	9	6
Pounds	32,751,757	28,980,962	22,317,248
Value	$3,292,512	$1,311,966	$991,974
Average value, 100 pounds	$10.00	$4.50	$4.45
Fustic—			
Number of establishments	[2] 5	5	(3)
Pounds	3,844,390	4,509,943	(3)
Value	$355,029	$222,804	(3)
Average value, 100 pounds	$9.25	$4.95	.....
Quercitron—			
Number of establishments	[2] 6	4	(3)
Pounds	6,745,979	3,844,882	(3)
Value	$303,472	$112,945	(3)
Average value, 100 pounds	$4.50	$2.95	.....
Other dyewood extracts—Brazilwoods, cutch, etc.—			
Pounds	2,078,287	3,434,150	(3)
Value	$312,924	$90,934	(3)
All other, dyewoods ground or chipped, and dyestuffs not dyewoods	$435,174	$123,513	$143,720
Tanning materials	$32,616,231	$7,808,672	$7,323,971
Extracts:			
Oak and chestnut—			
Number of establishments	[2] 34	24	.....
Pounds	507,905,777	328,197,524	266,529,514
North Carolina	63,879,651	48,855,547	(3)
Tennessee	175,418,997	117,510,960	(3)
Virginia	236,470,867	119,701,202	(3)
All other states	32,136,762	42,129,815	(3)
Tanning materials—Continued.			
Extracts—Continued.			
Oak and chestnut—Continued.			
Value	$18,663,125	$4,130,042	$4,321,637
Average value, 100 pounds	$3.65	$1.25	$1.60
Hemlock—			
Number of establishments	[2] 11	7	.....
Pounds	19,705,590	18,978,013	12,588,078
Value	$879,366	$340,402	$280,487
Average value, 100 pounds	$4.45	$1.80	$2.22
Sumac—			
Number of establishments	[2] 5	.....	.....
Pounds	4,507,433	4,512,361	3,148,790
Value	$253,088	$129,631	$107,450
Average value, 100 pounds	$5.60	$2.90	$3.40
Other tanning extracts, quebracho, spruce, gambier, chrome tanning, myrobalans, divi-divi, and gallnuts, in order as to value—			
Pounds	170,846,336	109,597,041	
Value	$8,059,912	$2,944,906	$2,614,391
Other tanning materials	$4,760,740	$353,691	
Mordants:			
Tannic acid—			
Pounds	665,772	760,100	
Value	$528,463	$234,630	$598,516
Other mordants	$690,178	$157,791	
Assistants:			
Turkey red oil—			
Pounds	2,477,874	11,681,884	1,814,506
Value	$319,050	$820,491	$108,292
Other assistants	$2,526,246	$716,510	(3)
Sizes:			
Dextrin—			
Pounds	49,328,560	18,913,641	
Value	$3,701,372	$705,584	
Average value, 100 pounds	$7.69	$3.73	16,148,931
Gum, other than rosin—			$610,999
Pounds	8,680,048	3,832,182	$3.78
Value	$634,595	$205,282	
Average value, 100 pounds	$7.31	$5.36	
Rosin—			
Pounds	57,055,943	20,717,148	
Value	$2,888,600	$373,218	$1,835,045
Average value, 100 pounds	$5.06	$1.80	
Other sizes	$4,264,074	$1,768,777	
All other products	$3,947,633	[1] $6,639,572	[1] $5,176,158

[1] Includes artificial dyestuffs and mineral colors or dyes to the value of $5,252,693 in 1914 and $3,683,553 in 1909.
[2] Distribution by states, 1919—Logwood, 10: New Jersey 3, Massachusetts 2, Pennsylvania 2, and 1 each in Maryland, New York, and Virginia; fustic, 5: New Jersey 2, and 1 each in New York, Pennsylvania, and Virginia; quercitron, 6: Pennsylvania 2, Virginia 2, New Jersey 1, and Tennessee 1; oak and chestnut, 34: Virginia 11, Tennessee 10, North Carolina 4, Pennsylvania 3, West Virginia 2, and 1 each in Alabama, California, Massachusetts, and New Jersey; hemlock, 11: Tennessee 4, Virginia 3, West Virginia 2, Michigan 1, and Pennsylvania 1; sumac, 5: Virginia 2, Massachusetts 1, New Jersey 1, and Pennsylvania 1.
[3] Figures not available.

GENERAL TABLES.

Table 14 gives for 1919, 1914, and 1909, by states, the number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products for the industry.

Table 15 presents for 1919 the statistics in detail for the industry as a whole, and by states, so far as they can be shown without disclosing the operations of individual establishments.

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

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	144	4,342	34,320	$4,735	$34,593	$53,744
	1914	112	2,839	23,290	1,613	13,238	20,620
	1909	107	2,397	22,213	1,291	9,684	15,955
Massachusetts	1919	27	165	773	200	4,476	5,811
	1914	17	148	520	99	1,162	1,674
	1909	10	80	325	50	512	725
New Jersey	1919	17	385	2,312	498	3,549	5,024
	1914	18	343	1,625	216	3,044	4,969
	1909	13	279	1,006	179	1,969	3,130
New York	1919	27	593	3,615	755	5,933	9,561
	1914	23	647	3,576	450	3,885	6,226
	1909	18	418	3,647	259	2,867	4,505
Pennsylvania	1919	12	426	4,145	446	2,863	3,800
	1914	9	265	3,113	182	1,158	1,569
	1909	14	369	3,516	187	1,373	2,345
Rhode Island	1919	14	66	686	$75	$666	$1,024
	1914	7	91	729	52	512	793
	1909	10	87	639	82	632	928
Tennessee	1919	10	1,037	7,643	895	3,673	7,562
	1914	6	365	4,065	173	770	1,536
	1909	6	336	4,119	156	642	1,313
Virginia	1919	17	1,002	10,038	1,090	4,933	9,426
	1914	13	429	4,309	161	1,138	1,677
	1909	14	346	4,209	123	686	1,260
All other states	1919	20	668	5,108	776	8,500	10,636
	1914	19	551	5,353	280	1,569	2,176
	1909	22	482	4,702	255	1,003	1,809

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

STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male.	Under 16. Female.	Capital.	EXPENSES. Salaries and wages. Officials.	EXPENSES. Salaries and wages. Clerks, etc.
United States	144	5,205	59	359	274	171	4,342	Jy 4,511	Ap 4,103	4,565	4,474	77	9	5	$38,689,058	$1,676,984	$643,930
Massachusetts	27	277	19	32	34	27	165	De 194	Ap 127	186	175	5	1	5	2,261,813	118,664	91,095
New Jersey	17	490	6	55	28	16	385	No 460	Ap [1] 332	454	439	8	7	.....	4,056,912	314,940	103,775
New York	27	791	6	80	73	39	593	De 743	Je [1] 534	744	709	35	.....	.....	9,218,733	551,112	131,529
North Carolina	5	351	1	11	3	1	335	Au 373	De 241	346	346	.....	.....	.....	1,649,705	33,792	6,011
Pennsylvania	12	519	4	29	33	27	426	No 463	My 391	452	451	.....	1	.....	3,721,936	112,563	78,223
Rhode Island	14	103	13	7	11	6	66	De 81	Fe [1] 57	78	77	1	.....	.....	784,674	27,197	26,016
Tennessee	10	1,109	.....	40	24	8	1,037	Jy 1,120	Ja 981	983	980	3	.....	.....	6,425,456	132,174	57,327
Virginia	17	1,112	5	55	33	17	1,002	Jy 1,060	Ap 925	971	971	.....	.....	.....	6,527,445	189,037	75,274
All other states [2]	15	453	5	50	35	30	333	.....	.....	351	326	25	.....	.....	4,042,384	197,505	74,680

STATE.	EXPENSES—continued. Salaries and wages—Continued. Wage earners.	For contract work.	Rent and taxes. Rent of factory.	Rent and taxes. Taxes, Federal, state, county, and local.	For materials. Principal materials.	For materials. Fuel and rent of power.	Value of products.	Value added by manufacture.	POWER. Primary horsepower. Total.	Owned. Steam engines (not turbines).	Owned. Steam turbines.	Owned. Internal-combustion engines.	Owned. Water power.[3]	Rented.[4]	Electric horsepower generated in establishments reporting.
United States	$4,734,614	$225,880	$84,864	$2,436,516	$32,916,972	$1,675,726	$53,744,283	$19,151,585	34,320	28,316	2,073	201	113	2,717	5,649
Massachusetts	199,918	.....	22,183	152,958	4,422,910	52,920	5,811,567	1,335,737	773	319	.....	25	8	421	.....
New Jersey	497,624	.....	15,238	88,119	3,443,082	105,885	5,924,057	2,375,090	2,312	435	1,150	.....	.....	727	1,049
New York	754,700	.....	29,274	1,028,216	5,765,125	167,993	9,560,583	3,627,465	3,615	2,676	373	.....	.....	566	658
North Carolina	306,330	.....	.....	37,239	1,467,013	194,514	2,443,899	782,372	3,138	2,663	475	.....	.....	.....	305
Pennsylvania	445,579	.....	6,371	66,222	2,793,103	69,419	3,800,246	937,724	4,145	3,893	.....	157	.....	95	1,051
Rhode Island	74,616	100,033	9,334	20,111	642,001	24,170	1,024,287	358,116	686	374	.....	.....	.....	312	.....
Tennessee	894,619	.....	.....	458,519	3,257,765	415,365	7,561,944	3,888,814	7,643	7,100	510	4	.....	29	1,497
Virginia	1,089,676	125,847	220	477,781	4,428,378	504,105	9,425,657	4,493,174	10,038	9,243	420	15	105	255	217
All other states [2]	471,552	.....	2,244	107,351	6,697,595	141,355	8,192,043	1,353,093	1,970	1,613	45	.....	.....	312	872

[1] Same number reported for one or more other months.
[2] All other states embrace: California, 2 establishments; Georgia, 1; Illinois, 3; Louisiana, 2; Maryland, 1; Michigan, 2; West Virginia, 3; and Wisconsin, 1.
[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).

PAINT AND VARNISH.

GENERAL STATISTICS.

General character of the industry.—The statistics presented in this report include the industries designated as (1) Paints and (2) Varnishes. The statistics for each industry have been tabulated separately, each establishment being classified according to the product of chief value. The first group includes establishments engaged primarily in the manufacture of colors or pigments, as well as paints in paste form and already mixed for use. The principal products of establishments of the second group are mainly solutions of gums, resins, asphaltum, etc., in solvents, or vehicles, such as turpentine, linseed oil, alcohol, naphtha, benzine, etc. The industry embraces japans and lacquers, and the products are classified according to their character. There is considerable overlapping between the two groups, and hence the tables showing products in detail are presented for the combined industry, since many establishments manufacture both classes of products.

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

Comparative summary for paint and varnish.—Table 2 presents the statistics for the combined paint and varnish industries, and the respective branches, for 1919 and 1914, with the percentage each component is of the combined industry.

Principal states, ranked by value of products.—Statistics are presented in Table 3 for the chief factors: Number of establishments, number of wage earners, value of products, and value added by manufacture, for all states for which the statistics can be reported separately, ranked according to value of products.

Persons engaged in the industry.—The age classification of the average number of wage earners, and other statistics for the combined industry in Table 4 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 15.

Wage earners, by months.—The statistics for wage earners in Table 5 are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year.

Prevailing hours of labor.—Table 6 shows that, in 1919, 6,713 wage earners, or 31.2 per cent of the total number, were employed in establishments where the prevailing hours per week were 48 or less. This is comparable with 5.5 per cent in 1914 and 4.6 per cent in 1909. On the other hand, in 1919, only 3.4 per cent were in the "60" and "Over 60" groups, as compared with 18.4 per cent in 1914 and 27.9 per cent in 1909.

Size of establishments, by average number of wage earners.—Table 7 shows that a large number of the establishments credited to the industry are found in the lower groups. Of the total number, 404, or 48.7 per cent, are found in the groups employing "1 to 5," or "no wage earners," in 1919, as compared with 53.1 per cent in 1914 and 56.8 per cent in 1909. On the other hand, the drift toward larger establishments is evidenced by the fact that 11 establishments, with 22.3 per cent of the wage earners, were in the groups covering over 250 wage earners in 1919, as compared with 8 establishments and 17.6 per cent of the wage earners in 1914, and 3 establishments with 9.4 per cent of the wage earners in 1909.

Size of establishments, by value of products.—The average value of products per establishment for all classes, in 1919, was $410,056, as compared with $182,030, in 1914, and $157,888 in 1909. The increase from 1914 to 1919 was to a large degree due to enhanced values, and, as a result, Table 8, being based upon value of products, shows heavy gains in the higher groups at the expense of the lower groups.

Character of ownership.—Although establishments under corporate ownership were in the majority, yet the industry included a considerable percentage of establishments owned by individuals or by firms and other forms of ownership of a nonincorporated character. These, however, were relatively small establishments and employed but a small percentage of the wage earners, and represented correspondingly small percentages of the value of products. Table 9 shows that in 1919 the incorporated establishments constituted 75.7 per cent of the total number, as compared with 69.8 per cent in 1914 and 66.5 per cent in 1909.

Number and horsepower of types of prime movers.—Table 10 gives the total horsepower reported for the industry. Electric power is becoming more and more an important factor. Of the total primary power, 50.8 per cent was purchased electric power in 1919, as compared with 27 per cent in 1914 and 13.9 per cent in 1909.

Fuel consumed.—Table 11 shows the consumption of fuel, by kinds and by states. The figures for gas include both manufactured and natural gas.

TABLE 1.—COMPARATIVE SUMMARY FOR THE COMBINED INDUSTRY: 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	830	800	791	639	600	522	325	3.8	1.1	23.8	6.5	14.9	60.
Persons engaged	34,030	25,682	21,806	16,480	13,819	(2)	(2)	32.5	17.3	32.9	19.3	.....	.....
Proprietors and firm members	298	391	456	439	412	(2)	(2)	−23.8	−14.3	3.9	6.6	.....	.....
Salaried employees	12,225	9,208	7,200	4,408	3,710	(2)	(2)	32.8	27.9	63.3	18.8	.....	.....
Wage earners (average number)	21,507	16,083	14,240	11,633	9,697	8,189	5,056	33.7	12.9	22.4	20.0	(3)	(3)
Primary horsepower	85,199	70,611	56,162	41,288	30,443	24,640	(2)	20.7	25.7	36.0	35.6	23.6	.....
Capital	$239,775,836	$129,533,935	$103,994,908	$75,486,214	$60,052,674	$45,318,146	$17,333,392	85.1	24.6	37.8	25.7	32.5	161.
Salaries and wages	50,640,787	24,369,021	18,649,074	11,941,059	9,942,241	7,354,687	2,498,971	107.8	30.7	56.2	20.1	35.2	194.
Salaries	26,522,628	14,188,733	10,378,361	5,677,451	5,016,651	(2)	(2)	86.9	36.7	82.8	13.2	.....	.....
Wages	24,118,159	10,180,288	8,270,713	6,263,608	4,925,590	(2)	(2)	136.9	23.1	32.0	27.2	.....	.....
Paid for contract work	729,885	91,602	91,549	146,734	197,055	(2)	(2)	696.8	0.1	−37.6	−25.5	.....	.....
Rent and taxes	8,399,760	1,647,370	977,751	[4] 665,568	[4] 621,975	(2)	(2)	409.9	68.5	(3)	(3)	(3)	(3)
Cost of materials	217,112,372	88,465,757	79,015,555	59,826,674	44,738,517	32,736,195	20,762,236	145.4	12.0	32.1	33.7	36.7	57.
Value of products	340,346,803	145,623,691	124,889,422	90,839,609	69,552,235	54,233,681	29,111,941	133.7	16.6	37.5	30.6	28.3	86.
Value added by manufacture[5]	123,234,431	57,157,934	45,873,867	31,012,935	24,823,718	21,497,486	8,349,705	115.6	24.6	47.9	24.9	15.5	157.

[1] A minus sign (−) denotes decrease.
[2] Figures not available.
[3] Figures not strictly comparable.
[4] Exclusive of internal revenue.
[5] Value of products less cost of materials.

TABLE 2.—COMPARATIVE SUMMARY FOR PAINT AND VARNISH: 1919 AND 1914.

	TOTAL. 1919	TOTAL. 1914	ESTABLISHMENTS ENGAGED PRIMARILY IN THE MANUFACTURE OF— Paint. 1919	Paint. 1914	Varnish. 1919	Varnish. 1914	PER CENT OF TOTAL. Paint. 1919	Paint. 1914	Varnish. 1919	Varnish. 1914
Number of establishments	830	800	601	585	229	215	72.4	73.1	27.6	26.
Persons engaged	34,030	25,682	26,645	20,072	7,385	5,610	78.3	78.2	21.7	21.
Proprietors and firm members	298	391	226	304	72	87	75.8	77.7	24.2	22.
Salaried employees	12,225	9,208	8,934	6,419	3,291	2,789	73.1	69.7	26.9	30.
Wage earners (average number)	21,507	16,083	17,485	13,349	4,022	2,734	81.3	83.0	18.7	17.
Primary horsepower	85,199	70,611	73,702	62,955	11,497	7,656	86.5	89.2	13.5	10.
Capital	$239,775,836	$129,533,935	$177,314,815	$99,673,137	$62,461,021	$29,860,798	74.0	76.9	26.0	23.
Salaries and wages	50,640,787	24,369,021	37,820,075	17,921,684	12,820,712	6,447,337	74.7	73.5	25.3	26.
Salaries	26,522,628	14,188,733	18,269,704	9,606,461	8,252,924	4,582,272	68.9	67.7	31.1	32.
Wages	24,118,159	10,180,288	19,550,371	8,315,223	4,567,788	1,865,065	81.1	81.7	18.9	18.
Paid for contract work	729,885	91,602	689,986	73,637	39,899	17,965	94.5	80.4	5.5	19.
Rent and taxes	8,399,760	1,647,370	6,331,973	1,313,289	2,067,787	334,081	75.4	79.7	24.6	20.
Cost of materials	217,112,372	88,465,757	165,604,116	71,588,364	51,508,256	16,877,393	76.3	80.9	23.7	19.
Value of products	340,346,803	145,623,691	256,714,379	112,408,742	83,632,424	33,214,949	75.4	77.2	24.6	22.
Value added by manufacture[1]	123,234,431	57,157,934	91,110,263	40,820,378	32,124,168	16,337,556	73.9	71.4	26.1	28.

[1] Value of product less cost of material.

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

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount.	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount.	Per cent distribution.	Rank
United States	830	21,507	100.0	.....	$340,346,803	100.0	.....	$123,234,431	100.0	.....
New York	148	3,872	18.0	1	66,243,534	19.5	1	26,625,526	21.6	1
Illinois	83	3,178	14.8	3	54,787,301	16.1	2	17,285,753	14.0	3
Ohio	94	2,929	13.6	4	50,477,810	14.8	3	18,170,959	14.7	2
Pennsylvania	104	3,279	15.2	2	38,845,266	11.4	4	13,345,065	10.8	4
New Jersey	63	1,994	9.3	5	31,815,368	9.3	5	11,005,200	8.9	5
Michigan	30	1,212	5.6	6	20,527,096	6.0	6	8,819,015	7.2	6
Missouri	37	991	4.6	7	16,558,775	4.9	7	5,486,124	4.5	7
California	46	737	3.4	8	11,846,040	3.5	8	4,164,459	3.4	8
Massachusetts	33	591	2.8	9	9,806,874	2.9	9	4,133,496	3.4	9
Indiana	23	257	1.2	13	4,315,023	1.3	12	1,514,655	1.2	12
Maryland	17	263	1.2	12	3,466,120	1.0	13	1,012,753	0.8	14
Minnesota	17	144	0.7	14	2,897,742	0.9	14	1,015,707	0.8	13
Nebraska	5	58	0.3	18	1,307,556	0.4	19	625,338	0.5	17
Colorado	7	76	0.4	17	1,168,001	0.3	20	479,419	0.4	21
Texas	8	52	0.2	19	1,019,069	0.3	22	504,489	0.4	19
West Virginia	4	132	0.6	15	864,447	0.3	23	468,773	0.4	22
Louisiana	3	34	0.2	21	767,342	0.2	25	252,157	0.2	25
Washington	6	20	0.1	22	486,783	0.1	26	219,696	0.2	26
Georgia	4	37	0.2	20	362,476	0.1	27	155,245	0.1	27
Iowa	4	10	(1)	24	268,434	0.1	28	108,808	0.1	28
Oregon	4	15	0.1	23	238,579	0.1	29	87,382	0.1	31
Maine	3	6	(1)	25	166,940	(1)	31	41,179	(1)	33
All other states	87	1,611	7.5	.....	22,110,227	6.5	.....	7,713,233	6.3	.....

[1] Less than one-tenth of 1 per cent.

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	34,030	28,831	5,199	84.7	15.3
	1914	25,082	22,777	2,905	88.7	11.3
	1909	21,896	19,496	2,400	89.0	11.0
Proprietors and officials	1919	2,971	2,871	100	96.6	3.4
	1914	2,135	2,091	44	97.9	2.1
	1909	2,016	1,960	56	97.2	2.8
Proprietors and firm members	1919	298	285	13	95.6	4.4
	1914	391	379	12	96.9	3.1
	1909	456	422	34	92.5	7.5
Salaried officers of corporations	1919	1,101	1,052	49	95.5	4.5
	1914	852	830	22	97.4	2.6
	1909	793	773	20	97.5	2.5
Superintendents and managers	1919	1,572	1,534	38	97.6	2.4
	1914	892	882	10	98.9	1.1
	1909	767	765	2	99.7	0.3
Clerks and other subordinate salaried employees.	1919	9,552	6,476	3,076	67.8	32.2
	1914	7,464	5,849	1,615	78.4	21.6
	1909	5,640	4,436	1,204	78.7	21.3
Wage earners (average number)	1919	21,507	19,484	2,023	90.6	9.4
	1914	16,083	14,837	1,246	92.3	7.7
	1909	14,240	13,100	1,140	92.0	8.0
16 years of age and over	1919	21,438	19,436	2,002	90.7	9.3
	1914	16,036	14,797	1,239	92.3	7.7
	1909	14,159	13,037	1,122	92.1	7.9
Under 16 years of age	1919	69	48	21	69.6	30.4
	1914	47	40	7	85.1	14.9
	1909	81	63	18	77.8	22.2

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

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

	Average number employed during year.	NUMBER EMPLOYED ON 15TH DAY OF THE MONTH OR NEAREST REPRESENTATIVE DAY. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	21,507	19,711	*19,707*	19,946	20,424	20,905	21,311	21,972	22,429	22,679	22,927	22,917	23,156	85.1
Males	19,484	17,927	*17,875*	18,060	18,446	18,891	19,232	19,873	20,292	20,545	20,804	20,833	21,030	85.0
Females	2,023	*1,784*	1,832	1,886	1,978	2,014	2,079	2,099	2,137	2,134	2,123	2,084	2,126	83.5
Paint	17,485	16,094	*16,070*	16,262	16,625	17,071	17,351	17,891	18,170	18,339	18,588	18,593	18,766	85.6
Males	15,843	14,652	*14,673*	14,716	15,004	15,422	15,651	16,181	16,432	16,633	16,887	16,918	17,047	85.5
Females	1,642	*1,442*	1,407	1,546	1,621	1,649	1,700	1,710	1,738	1,706	1,701	1,675	1,719	83.0
Varnish	4,022	*3,617*	3,637	3,684	3,799	3,834	3,960	4,081	4,259	4,340	4,339	4,324	4,390	82.4
Males	3,641	*3,275*	3,302	3,344	3,442	3,469	3,581	3,692	3,860	3,912	3,917	3,915	3,983	82.2
Females	381	342	*335*	340	357	365	379	389	399	428	422	409	407	78.3
1914	16,083	15,723	16,277	16,593	16,852	**16,905**	16,870	16,030	15,821	15,872	15,564	15,288	*15,201*	89.9
1909	14,240	*13,223*	13,835	14,360	14,635	**14,692**	14,582	14,202	14,141	14,236	14,444	14,296	14,231	90.0
California	737	*597*	651	638	703	719	731	773	828	777	820	808	799	72.1
Illinois	3,178	3,051	*3,016*	3,050	3,022	3,028	3,021	3,103	3,138	3,362	3,408	3,379	3,558	84.8
Michigan	1,212	1,100	*1,059*	1,088	1,137	1,186	1,162	1,107	1,282	1,289	1,386	1,346	1,352	76.4
Missouri	991	*811*	857	884	998	987	978	1,054	1,104	1,113	1,107	1,068	931	72.9
New Jersey	1,994	1,878	1,829	*1,810*	1,819	1,907	1,951	2,009	2,088	2,120	2,164	2,171	2,182	83.0
New York	3,872	*3,493*	3,528	3,570	3,657	3,795	3,945	4,051	4,062	4,097	4,038	4,096	4,132	85.3
Ohio	2,929	*2,598*	2,648	2,682	2,776	2,912	3,014	3,052	3,089	3,023	3,075	3,154	3,125	82.4
Pennsylvania	3,279	3,053	*3,047*	3,106	3,150	3,188	3,288	3,424	3,418	3,438	3,418	3,380	3,438	88.6

TABLE 6.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED STATES: 1919 AND 1914.

STATE AND 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	21,507	1,057	758	4,898	7,475	2,280	4,300	524	215
Paint industry	17,485	768	348	4,136	5,406	2,018	4,092	502	215
Varnish industry	4,022	289	410	762	2,069	262	208	22	.....
1914	16,083	(2)	(2)	887	2,763	4,060	5,409	1,943	1,021
1909	14,240	(2)	(2)	656	2,332	2,601	4,681	3,440	530
California: [3]									
1919	737	27	22	441	121	45	78	3	.....
Illinois:									
1919	3,178	83	44	392	1,175	232	1,155	97	.....
1914	2,110	(2)	(2)	49	433	358	1,053	182	35
Michigan:									
1919	1,212	3	.....	8	207	665	322	7	.....
1914	878	(2)	(2)	1	16	455	379	27	.....
Missouri:									
1919	991	12	173	377	164	3	220	.....	42
1914	599	(2)	(2)	52	50	138	146	167	46
New Jersey:									
1919	1,994	150	289	418	507	154	374	8	94
1914	1,737	(2)	(2)	44	535	365	506	198	89
New York:									
1919	3,872	236	118	667	2,494	248	100	9	.....
1914	3,450	(2)	(2)	234	1,046	728	984	423	35
Ohio:									
1919	2,929	49	26	518	1,470	86	713	67	.....
1914	2,107	(2)	(2)	82	319	235	925	546	.....
Pennsylvania:									
1919	3,279	152	33	1,535	739	333	434	48	5
1914	2,643	(2)	(2)	180	70	853	617	143	780

[1] Includes 48 and under for 1914 and 1909. [2] Corresponding figures not available. [3] Not shown separately in 1914.

TABLE 7.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED 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.	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	830	21,507	49	355	960	219	2,509	100	3,097	56	3,977	40	6,163	9	2,919	1	852	1	1,030
Paint industry	601	17,485	33	256	670	151	1,706	71	2,264	48	3,413	32	4,942	8	2,608	1	852	1	1,030
Varnish industry	229	4,022	16	99	290	68	803	29	833	8	564	8	1,221	1	311	....	.....	....	.....
1914	800	16,083	40	385	935	217	2,354	81	2,664	38	2,761	31	4,532	7	2,281	1	556	....	.....
1909	791	14,240	38	411	1,017	191	2,056	79	2,551	38	2,588	31	4,682	2	715	1	631	....	.....
California	46	737	2	28	90	9	96	3	106	3	173	....	.....	1	272	....	.....	....	.....
Illinois	83	3,178	2	31	88	18	214	13	403	12	843	6	778	....	.....	1	852	....	.....
Massachusetts	33	591	3	11	28	12	123	2	47	5	393	....	.....	....	.....	....	.....	....	.....
Michigan	30	1,212	2	13	32	6	78	3	85	2	170	3	395	1	452	....	.....	....	.....
Missouri	37	991	2	15	38	10	128	4	180	4	269	2	376	....	.....	....	.....	....	.....
New Jersey	63	1,994	2	22	57	17	207	11	383	4	310	6	757	1	280	....	.....	....	.....
New York	148	3,872	8	61	166	38	453	20	585	11	776	9	1,606	1	286	....	.....	....	.....
Ohio	94	2,929	3	38	110	29	296	12	360	3	225	6	958	3	971	....	.....	....	.....
Pennsylvania	104	3,279	10	46	129	22	274	14	372	8	566	1	250	2	658	....	.....	1	1,030

TABLE 8.—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	830	800	791	21,507	16,083	14,240	$340,346,803	$145,623,691	$124,889,422	$123,234,431	$57,157,934	$45,873,857
Less than $5,000	53	85	104	34	54	82	133,873	209,101	244,517	66,092	105,631	121,015
$5,000 to $20,000	114	189	175	177	418	386	1,266,394	2,125,922	2,034,695	560,182	993,197	961,382
$20,000 to $100,000	230	261	273	940	1,538	1,734	12,160,855	12,790,449	13,241,833	4,469,576	4,866,301	5,516,438
$100,000 to $500,000	273	195	213	4,136	7,835	7,133	68,563,851	46,347,266	65,259,238	26,099,102	28,454,103	23,689,490
$500,000 to $1,000,000	68	37		2,842			47,000,247	25,391,487		16,338,826		
$1,000,000 and over	92	33	26	13,378	6,238	4,905	211,221,583	58,759,466	44,109,139	75,700,653	22,738,702	15,585,542
	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	6.4	10.6	13.1	0.2	0.3	0.6	(1)	0.1	0.2	0.1	0.2	0.3
$5,000 to $20,000	13.7	23.6	22.2	0.8	2.6	2.7	0.4	1.5	1.6	0.5	1.7	2.1
$20,000 to $100,000	27.7	32.6	34.5	4.4	9.6	12.2	3.6	8.8	10.6	3.6	8.5	12.0
$100,000 to $500,000	32.9	24.4	26.9	19.2	48.7	50.1	20.1	31.8	52.3	21.2	49.8	51.6
$500,000 to $1,000,000	8.2	4.6		13.2			13.8	17.4		13.3		
$1,000,000 and over	11.1	4.2	3.3	62.2	38.8	34.4	62.1	40.4	35.3	61.4	39.8	34.0

[1] Less than one-tenth of 1 per cent.

TABLE 9.—CHARACTER OF OWNERSHIP, BY SELECTED STATES: 1919 AND 1914.

STATE AND CENSUS 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.	
	Individuals.	Corporations	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States:																	
1919	128	628	74	21,507	529	20,237	741	2.5	94.1	3.4	$340,346,803	$7,968,219	$320,828,085	$11,550,499	2.3	94.3	3.4
Paint industry	93	451	57	17,485	411	16,370	704	2.4	93.6	4.0	256,714,379	5,146,101	241,017,967	10,550,311	2.0	93.9	4.1
Varnish industry	35	177	17	4,022	118	3,867	37	2.9	96.1	0.9	83,632,424	2,822,118	79,810,118	1,000,188	3.4	95.4	1.2
1914	152	558	90	16,083	827	14,489	767	5.1	90.1	4.8	145,623,691	5,791,435	133,240,662	6,591,594	4.0	91.5	4.5
1909	160	526	105	14,240	910	12,087	1,243	6.4	84.9	8.7	124,889,422	7,536,788	106,349,811	11,002,823	6.0	85.2	8.8
California:																	
1919	12	29	5	737	36	685	16	4.9	92.9	2.2	11,846,040	536,651	11,100,747	208,642	4.5	93.7	1.8
Illinois:																	
1919	11	68	4	3,178	83	3,081	14	2.6	96.9	0.4	54,787,301	1,430,281	52,749,977	607,043	2.6	96.3	1.1
1914	10	59	3	2,110	144	1,959	7	6.8	92.8	0.3	24,488,449	922,581	23,503,708	62,160	3.8	96.0	0.3
Michigan:																	
1919	3	25	2	1,212	[1] 9	1,203	.....	.....	99.3	.....	20,527,096	[1] 238,937	20,288,159	.....	1.2	98.8	.....
1914	2	22	2	878	.....	874	[2] 4	.....	99.5	0.5	8,306,609	.....	8,282,642	[2] 23,967	.....	99.7	0.3
Missouri:																	
1919	3	32	2	991	[1] 6	985	.....	.....	99.4	.....	16,558,775	[1] 135,405	16,423,370	.....	0.8	99.2	.....
1914	2	31	1	599	[1] 7	592	.....	1.2	98.8	.....	5,791,895	[1] 99,024	5,692,871	.....	1.7	98.3	.....

[1] Includes the group "All others."

[2] Includes the group "Individuals."

TABLE 9.—CHARACTER OF OWNERSHIP, BY SELECTED STATES: 1919 AND 1914—Continued.

STATE AND CENSUS 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.		
	Individuals.	Corporations	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.		Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
New Jersey:																	
1919	12	48	3	1,994	34	1,907	53	1.7	95.6	2.7	$31,815,368	$677,670	$30,179,481	$958,217	2.1	94.9	3.0
1914	12	43	5	1,737	41	1,618	78	2.4	93.1	4.5	16,086,717	387,707	15,002,843	696,167	2.4	93.3	4.3
New York:																	
1919	27	109	12	3,872	147	3,596	129	3.8	92.9	3.3	66,243,534	2,628,376	60,840,215	2,774,943	4.0	91.8	4.2
1914	39	91	20	3,450	300	2,836	314	8.7	82.2	9.1	31,884,421	2,334,956	26,554,871	2,994,594	7.3	83.3	9.4
Ohio:																	
1919	10	77	7	2,929	26	2,878	25	0.9	98.3	0.9	50,477,810	509,351	49,393,102	575,357	1.0	97.9	1.1
1914	17	72	6	2,107	30	2,039	38	1.4	96.8	1.8	19,326,576	227,772	18,719,880	378,924	1.2	96.9	2.0
Pennsylvania:																	
1919	22	64	18	3,279	129	3,060	90	3.9	93.3	2.7	38,845,266	925,379	36,024,687	1,895,200	2.4	92.7	4.9
1914	32	62	20	2,643	196	2,355	92	7.4	89.1	3.5	16,004,616	998,521	14,176,902	829,193	6.2	88.6	5.2

TABLE 10.—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	3,612	2,159	1,378	85,199	70,611	56,162	100.0	100.0	100.0
Owned	444	578	651	41,559	48,533	47,487	48.8	68.7	84.6
Steam [1]	351	439	510	37,967	43,881	42,191	44.6	62.1	75.1
Engines	338	(2)	(2)	34,647	(2)	(2)	40.7	.....	.....
Turbines	13	(2)	(2)	3,320	(2)	(2)	3.9	.....	.....
Internal-combustion engines	67	107	110	2,573	3,226	3,290	3.0	4.6	5.9
Water wheels, turbines, and motors	26	32	31	1,019	1,426	2,006	1.2	2.0	3.6
Rented	3,168	1,581	727	43,640	22,078	8,675	51.2	31.3	15.4
Electric	3,168	1,581	727	43,268	19,035	7,814	50.8	27.0	13.9
Other	.....	.....	.....	372	3,043	861	0.4	4.3	1.5
Electric	4,690	2,804	1,353	64,241	34,917	17,037	100.0	100.0	100.0
Rented	3,168	1,581	727	43,268	19,035	7,814	67.4	54.5	45.9
Generated by establishments reporting	1,522	1,223	626	20,973	15,882	9,223	32.6	45.5	54.1

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

TABLE 11.—FUEL CONSUMED, BY STATES: 1919 AND 1914.

STATE.	Census year.	COAL.		Coke (tons, 2,000 lbs.)	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
		Anthracite [1] (tons, 2,240 lbs.).	Bituminous (tons, 2,000 lbs.).				
United States:							
Paint and varnish	1919	93,545	440,717	36,319	54,213	1,821	261,291
Paint industry	.....	76,186	406,889	17,047	51,312	738	207,610
Varnish industry	.....	17,359	33,828	19,272	2,901	1,083	53,681
Paint and varnish	1914	81,566	301,554	25,461	23,584	(2)	366,695
Per cent of increase [3]	.....	14.7	46.1	42.6	134.6	.....	−28.7
California	1919	.....	4	41	17,214	.....	12,761
Connecticut	1919	111	1,688	20	6,000	.....	.....
Illinois	1919	74	89,248	8,153	8,670	4	10,617
	1914	35	72,456	4,212	5,126	(2)	2,418
Indiana	1919	5	1,903	432	350	37	2,727
Kansas	1919	.....	32,635	.....	.....	1	66
Kentucky	1919	.....	1,414	1,137	.....	.....	317
Maryland	1919	15	9,144	.....	.....	35	138
Massachusetts	1919	296	6,300	803	.....	31	6,653
	1914	1,361	5,972	2,245	358	(2)	36
Michigan	1919	3	19,289	3,836	.....	231	628
	1914	21	19,582	2,598	.....	.....	2,131
Minnesota	1919	22	765	28	.....	120	1,892
	1914	13	2,729	68	2	(2)	825
Missouri	1919	25	37,485	1,219	12,968	20	254
	1914	4	20,613	211	1	(2)	1,138
New Jersey	1919	6,825	54,542	3,595	5,087	100	68,773
	1914	20,921	49,062	3,113	60	(2)	10,451
New York	1919	33,648	26,798	6,768	834	380	7,826
	1914	48,696	19,199	4,707	375	(2)	4,048
Ohio	1919	8,772	25,524	7,191	247	601	60,160
	1914	13	18,026	3,540	9	(2)	223,179
Pennsylvania	1919	21,872	105,604	2,698	2,293	67	75,678
	1914	9,703	65,886	2,040	561	(2)	107,042
Tennessee	1919	.....	2,178	62	.....	.....	.....
Texas	1919	4	.....	68	500	18	301
Virginia	1919	6,423	1,031	103	.....	14	88
West Virginia	1919	.....	1,520	.....	.....	.....	1,686
Wisconsin	1919	15,380	13,785	.....	.....	(2)	9,423
All other states	1919	120	9,860	165	50	162	1,303
	1914	799	28,029	2,727	17,092	(2)	15,427

[1] Includes some semianthracite coal. [2] Included in figures for fuel oils. [3] A minus sign (−) denotes decrease.

SPECIAL STATISTICS.

Table 12 presents statistics of materials and products for 1919, in comparison with 1914 and 1909. There is a considerable production of paints and varnishes by establishments falling under other industry classifications, which are here included, and the figures for specific products represent total production irrespective of the industry classification of the producing establishments.

TABLE 12.—MATERIALS AND PRODUCTS: 1919, 1914, AND 1909.

	1919	1914	1909
Number of establishments	886	857	863
Paint industry	601	585	588
Varnish industry	229	215	203
Subsidiary paint and varnish products, other industries	56	57	72
MATERIALS.			
Total cost	$223,091,742	$88,980,635	$79,136,194
Paint industry, cost	$165,604,116	$71,588,364	$62,458,250
Varnish industry, cost	51,508,256	16,877,393	16,557,305
Other industries, producing paint and varnish as subsidiary products, cost	5,979,370	514,878	120,639
Pig lead:			
Tons (2,000 lbs.)	192,558	159,762	159,163
Cost	$22,159,573	$11,488,113	$12,380,524
Grain alcohol:			
Gallons	2,985,735	1,061,324	356,225
Cost	$1,724,112	$436,509	$226,724
Wood alcohol:			
Gallons	244,561	987,451	1,325,807
Cost	$303,998	$422,122	$693,362
Linseed oil:			
Gallons	27,037,192	24,481,623	(1)
Cost	$43,721,595	$12,049,218	(1)
China wood oil:			
Gallons	6,196,134	(1)	(1)
Cost	$10,254,030	(1)	(1)
Cottonseed oil:			
Gallons	16,506	(1)	(1)
Cost	$24,028	(1)	(1)
Corn oil:			
Gallons	55,074	(1)	(1)
Cost	$76,739	(1)	(1)
Soya-bean oil:			
Gallons	2,753,173	(1)	(1)
Cost	$3,630,634	(1)	(1)
Other oils (fish oil, tar oil, kerosene, creosote, parilla, hempseed oil, etc.):			
Gallons	8,749,494	(1)	(1)
Cost	$3,373,988	(1)	(1)
Benzol:			
Gallons	1,665,605	(1)	(1)
Cost	$400,162	(1)	(1)
Turpentine:			
Gallons	6,081,902	(1)	(1)
Cost	$6,961,982	(1)	(1)
MATERIALS—continued.			
Rosin:			
Pounds	85,917,127		
Cost	$5,411,192		
Copal, damar, or kauri:			
Pounds	18,235,774		
Cost	$3,250,165	48,902,000	(1)
Shellac:		$4,797,944	(1)
Pounds	7,785,319		
Cost	$4,653,619		
Other gums:			
Pounds	17,116,381		
Cost	$1,873,210		
Fuel and rent of power, cost	4,122,151	1,592,230	$1,306,297
All other materials, cost	111,150,555	58,194,499	64,520,287
PRODUCTS.			
Total value	$381,916,186	$149,173,400	$127,472,819
Paint industry, value	256,714,379	112,408,742	94,572,005
Varnish industry, value	83,632,421	33,214,949	30,317,417
Paint and varnish subsidiary products of other industries, value	41,569,383	3,549,709	2,583,397
Colors (pigments), value	72,457,266	17,450,482	18,134,869
Paints in oil, value	168,525,448	70,582,461	57,380,539
Water paints and kalsomine, value	5,351,918	2,202,281	1,981,161
Varnishes and japans, value	86,814,800	36,142,256	31,758,735
Fillers:			
Liquid—			
Gallons	2,605,285	965,636	1,166,533
Value	$1,835,573	$670,033	$828,393
Paste—			
Pounds	15,508,344		
Value	$1,480,529	49,587,548	65,148,395
Dry—		$1,318,729	$1,199,595
Pounds	1,473,164		
Value	$71,285		
Putty:			
Pounds	66,681,514	69,828,017	67,767,348
Value	$3,164,254	$1,250,421	$1,169,683
Linseed oil, raw:			
Gallons	1,693,414	2,230,988	2,093,696
Value	$2,888,623	$1,201,839	$1,106,181
Linseed oil, boiled:			
Gallons	611,126	572,561	1,379,025
Value	$1,044,814	$306,569	$806,846
Other oils:			
Gallons	3,504,333	(1)	(1)
Value	$3,115,999	$999,392	(1)
Bleached shellac:			
Pounds	8,799,191	8,654,514	3,905,593
Value	$5,955,732	$1,806,802	$772,240
Dryers:			
Gallons	408,572	1,047,140	(1)
Value	$511,485	$257,725	(1)
All other products, value	$28,698,460	$14,984,419	$12,334,577

[1] Figures not available.

In some cases the products reported include subsidiary products that fall under other industry classifications. The value of same, so far as they can be identified, amounted in 1919 to $4,886,038. The net product balance, therefore, for the combined industries, crediting subsidiary products from other industries, and debiting subsidiary products to other industries, will be $377,036,151.

The table presents the materials in detail, quantities and cost, but carries under "Products" group totals for colors, paints in oil, water paints and kalsomine, and varnishes and japans. The detailed statistics for these groups will be found in Table 13.

Table 13 gives the detailed statistics for products for 1919 and 1914, distributed by states, together with the number of producing establishments.

TABLE 13.—DETAILED STATISTICS OF PRODUCTS—QUANTITY, VALUE, AND NUMBER OF ESTABLISHMENTS, BY STATES: 1919 AND 1914.

PRODUCT AND STATE.	1919			1914		
	Number of establishments.	Quantity.	Value.	Number of establishments.	Quantity.	Value.
		Pounds.			*Pounds.*	
COLORS (PIGMENTS) [1]	....	.....	$72,457,266	....	.....	$17,450,482
White lead, dry	21	262,959,465	.....	20	279,289,800	.....
For sale	21	80,454,977	6,318,504	18	71,643,812	3,697,702
Illinois	4	22,630,278	1,942,033	3	16,783,007	950,147
Pennsylvania	5	12,787,614	1,146,804	4	10,295,241	517,772
New York	3	5,401,781	502,625	3	12,341,619	631,642
All other states	9	39,635,304	2,727,042	8	32,223,945	1,598,141
Made and consumed	17	182,504,488	.....	20	207,626,048	.....
Zinc oxide [2]	16	279,321,235	24,082,299	....	.....	.....
Pennsylvania	4	223,465,331	19,736,298	....	(3)	(3)
Illinois	4	13,931,600	1,293,349	....	.....	.....
All other states	8	41,924,304	3,052,652	....	.....	.....
Lithopone [4]	14	154,622,275	.....	7	48,972,062	.....
For sale	14	151,200,696	9,757,559	7	48,972,062	1,857,510
New Jersey	4	55,124,026	3,615,545	3	22,710,825	877,184
Pennsylvania	3	36,043,537	2,306,186	....	(3)	(3)
Illinois	3	16,414,656	1,025,759	....	(3)	(3)
All other states	4	43,618,477	2,810,069	4	26,261,237	980,326
Made and consumed	2	3,421,579	.....	....	.....	.....
Lead oxides	16	165,106,671	.....	24	61,335,290	.....
For sale	16	162,474,216	12,748,344	22	58,642,588	3,281,716
Missouri	3	58,591,582	3,702,075	3	3,224,070	232,180
Pennsylvania	4	41,785,966	3,448,004	5	18,107,863	930,496
All other states	9	62,096,668	5,598,265	14	37,310,655	2,119,040
Made and consumed	4	2,632,455	.....	7	2,692,702	.....
Carbon black [5]	3	905,192	49,046	....	(3)	(3)
Barytes	4	39,906,000	455,257	6	46,920,380	325,922
Vermilion (true)	5	327,454	237,825	4	322,759	200,134
Fine colors (not elsewhere specified)	11	6,681,210	2,384,054	18	6,914,513	913,004
New York	5	3,191,719	1,458,683	6	2,513,300	450,419
All other states	6	3,489,491	925,371	12	4,401,213	462,585
Chrome yellow, orange, or green	23	9,494,800	2,081,440	29	13,771,726	1,318,863
Reported as—						
Chrome yellow	8	2,370,648	612,310	15	5,747,317	641,534
Orange or green	9	2,985,680	666,705	14	8,024,409	677,329
New York	4	2,405,482	478,412	3	1,989,878	183,356
All other states	5	580,198	188,293	11	6,034,531	493,973
Chrome yellow, orange, or green	6	4,138,472	802,425	....	(3)	(3)
Iron buff or other earth colors	34	202,181,787	3,778,942	23	92,896,956	797,819
Pennsylvania	13	124,746,769	2,433,231	4	28,791,520	199,576
New York	7	19,189,948	425,966	....	(3)	(3)
All other states	14	58,245,070	919,745	19	64,105,436	598,243
Prussian blue	11	944,649	645,179	17	1,239,382	387,077
Illinois	3	156,928	118,594	....	(3)	(3)
New Jersey	3	193,309	86,471	....	(3)	(3)
All other states	5	594,412	440,114	....	(3)	(3)
Other dry colors	39	37,447,782	5,480,028	58	95,616,993	3,616,445
New York	10	8,894,287	2,346,911	20	14,844,816	1,274,060
New Jersey	9	9,809,241	1,975,482	6	7,023,877	816,963
Illinois	3	6,471,972	369,727	5	2,311,282	297,932
Pennsylvania	4	501,790	114,005	11	58,130,582	933,862
All other states	13	11,770,492	673,903	16	13,306,436	293,628
Pulp colors, sold moist	19	30,084,301	3,262,284	29	22,110,527	1,054,290
Pennsylvania	5	15,359,815	1,335,181	5	4,767,853	180,066
New York	5	10,335,681	1,307,541	10	11,336,894	583,417
New Jersey	5	2,272,615	271,266	5	4,125,114	157,406
All other states	4	2,116,190	348,296	9	1,880,666	133,401
Other mineral colors	8	38,263,989	1,176,505	....	(3)	(3)
PAINTS IN OIL	....	.....	168,525,448	....	.....	70,582,461
In paste form (ground in oil)	....	.....	49,183,229	....	.....	29,038,181
White lead	145	237,358,672	25,606,609	214	281,417,563	18,141,444
Illinois	15	75,793,862	7,992,259	23	73,019,593	5,000,591
New York	15	39,321,030	4,322,900	20	63,805,600	3,795,370
PAINTS IN OIL—Contd						
In paste form (ground in oil)—Contd.						
White lead—Contd.		*Pounds.*			*Pounds.*	
Ohio	17	35,408,775	$4,140,545	26	29,011,498	$1,910,042
Pennsylvania	23	28,837,497	3,252,483	38	41,526,000	2,470,052
Missouri	10	28,733,270	2,899,186	14	34,389,924	2,180,674
California	10	15,950,033	1,717,362	12	11,635,836	711,944
New Jersey	7	7,137,979	700,927	10	12,210,626	668,300
Massachusetts	7	1,012,726	93,902	8	2,914,735	171,563
Indiana	6	538,893	62,026	8	832,890	53,369
Tennessee	5	241,750	31,568	5	102,779	7,855
All other states	30	4,382,857	393,451	50	11,968,082	1,171,684
Zinc oxide	121	14,342,051	1,770,751	158	9,551,840	730,918
Maryland	4	4,041,000	491,082	....	(3)	(3)
New Jersey	8	4,482,877	409,625	7	2,944,815	230,500
New York	13	1,903,214	315,970	19	1,239,995	82,350
California	15	1,583,491	221,421	16	1,143,578	74,502
Missouri	7	667,550	93,224	8	322,352	25,180
Pennsylvania	16	593,115	79,160	25	1,746,243	179,632
Illinois	10	218,562	36,443	17	963,116	53,745
Massachusetts	4	193,519	27,404	5	54,949	4,378
Tennessee	5	123,400	20,940	4	29,943	3,044
Ohio	12	60,538	10,665	17	215,583	22,436
Colorado	4	9,804	1,221	....	(3)	(3)
Indiana	3	2,500	432	4	62,050	4,700
All other states	20	462,481	63,164	36	829,216	50,451
All other paints in paste form	281	146,568,395	21,805,869	301	129,042,658	10,165,819
New York	32	30,180,770	5,683,534	38	22,202,906	1,985,570
Ohio	37	18,014,708	3,244,078	40	13,024,015	1,064,064
Illinois	34	22,563,497	2,701,571	26	19,308,740	1,365,922
New Jersey	14	15,296,177	2,205,917	14	9,333,604	1,108,394
Pennsylvania	40	14,727,206	1,588,435	57	28,190,754	1,404,036
Wisconsin	5	5,511,847	1,266,930	6	4,165,767	333,873
Michigan	6	11,053,705	1,165,716	9	7,485,471	731,917
California	19	6,731,721	957,481	17	4,107,727	474,306
Massachusetts	13	5,794,632	776,500	13	3,459,871	343,960
Missouri	16	5,201,378	610,088	14	3,311,460	403,319
Minnesota	5	1,824,672	329,095	5	1,785,554	183,966
Kentucky	6	1,819,826	312,014	8	4,224,946	255,950
Maryland	4	1,772,878	195,313	3	443,160	35,567
Indiana	9	1,237,153	173 560	9	1 767 362	138 469
Tennessee	6	1 073 480	166 778	3	201 977	19 341
Virginia	4	1 578,129	151,003	....	(3)	(3)
Colorado	5	295,583	51,271	....	(3)	(3)
Texas	4	207,776	31,007	4	89,252	7,761
All other states	22	1,683,257	195,569	35	5,940,092	309,314
		Gallons.			*Gallons.*	
Already mixed for use	508	59,646,832	119,342,219	448	40,745,563	41,544,280
Ohio	68	12,154,953	24,787,950	58	8,281,238	8,551,040
Illinois	45	11,237,001	21,965,838	34	8,467,040	7,818,936
New York	72	6,282,237	13,541,790	63	5,112,386	5,948,258
Pennsylvania	60	5,055,630	10,341,233	68	3,099,564	2,862,000
New Jersey	34	5,072,462	9,442,801	23	2,967,518	2,803,888
Michigan	19	4,092,597	8,651,866	17	2,546,901	2,807,279
Missouri	23	3,267,734	6,368,023	20	1,845,557	1,712,959
California	36	3,170,928	5,679,394	26	1,421,680	1,410,498
Wisconsin	5	1,431,803	2,180,209	6	775,426	835,129
Kentucky	13	1,036,667	2,031,067	13	1,018,286	964,162
Massachusetts	16	914,214	1,986,821	15	748,594	907,359
Indiana	17	732,328	1,773,750	14	372,032	395,284
Minnesota	10	708,729	1,712,431	9	1,000,859	1,103,033
Maryland	10	937,949	1,461,342	6	645,097	709,066
Nebraska	5	474,205	1,131,487	4	192,043	215,959
Colorado	7	438,179	942,018	5	304,827	347,045
Texas	7	536,031	874,518	6	184,250	202,256
Tennessee	7	285,456	849,434	7	264,976	352,784
Rhode Island	4	224,842	500,762	4	438,634	413,246
Connecticut	4	253,190	498,026	6	209,287	271,656
Virginia	7	162,048	405,867	3	129,010	123,010
Washington	5	153,000	314,816	7	107,468	138,326
Iowa	4	141,049	236,018	5	32,034	76,683
West Virginia	3	103,132	213,537	....	(3)	(3)
Kansas	6	133,583	145,848	....	(3)	(3)
Georgia	3	63,566	139,167	5	103,250	112,674
Florida	4	20,315	36,649	....	(3)	(3)
All other states	14	513,004	1,129,557	24	427,006	461,800

[1] According to the reports of the U. S. Geological Survey, in 1919, 155,648 tons of zinc and lead pigments, valued at $25,810,671; and in 1914, 106,791 tons, valued at $9,978,710, were made direct from ores. Figures for natural mineral pigments for 1919 are not available, but in 1914, 66,766 tons, valued at $633,390, were marketed.

[2] In addition, in 1919, 6,185,602 pounds of zinc oxide (comprising 4,299,602 pounds, valued at $374,188; and 1,886,000 pounds made and consumed in the producing establishments) were produced by chemical establishments. Total production of zinc oxide, 1919, 285,506,837 pounds.

[3] Figures not available.

[4] Marketed production of lithopone as reported by Geological Survey, 1919, 78,365 tons (2,000 pounds); 1914, 32,819 tons.

[5] Production of carbon black by establishments in the paint industry. Total production of carbon black (from natural gas), 52,056,940 pounds; value, $3,816,000.

TABLE 13.—DETAILED STATISTICS OF PRODUCTS—QUANTITY, VALUE, AND NUMBER OF ESTABLISHMENTS, BY STATES: 1919 AND 1914—Continued.

PRODUCT AND STATE.	1919			1914		
	Number of establishments.	Quantity.	Value.	Number of establishments.	Quantity.	Value.
WATER PAINTS AND KALSOMINE		*Pounds.*			*Pounds.*	
	....	.....	$5,351,918	....	.....	$2,202,281
Dry or in paste	61	106,797,920	4,549,113	59	61,904,258	2,055,180
New York	15	51,599,620	2,009,629	19	31,191,409	1,051,983
Illinois	7	12,420,067	835,785	8	11,304,884	409,069
New Jersey	3	12,728,872	596,092	3	12,818,350	362,259
California	5	16,820,120	532,936	....	(1)	(1)
Missouri	5	5,318,935	194,576	4	487,763	44,800
Ohio	6	2,648,200	156,285	5	1,500,616	45,569
Michigan	5	2,664,371	113,693	....	(1)	(1)
Pennsylvania	6	1,301,477	48,348	7	305,499	14,070
All other states	9	1,296,258	61,769	13	4,295,737	127,430
		Gallons.			*Gallons.*	
Mixed for use	12	359,129	802,805	12	297,173	147,101
VARNISHES AND JAPANS	....	.....	86,814,800	....	.....	36,142,256
Oleoresinous varnishes	186	28,116,160	40,044,863	168	17,801,438	18,762,399
New York	26	5,367,111	9,358,203	28	4,866,219	5,061,508
Ohio	30	5,115,175	7,218,545	31	3,268,124	2,887,622
New Jersey	24	3,401,810	5,544,201	22	2,626,073	3,079,321
Illinois	25	4,594,475	5,134,512	18	2,762,458	2,775,662
Michigan	9	3,249,205	4,785,119	6	1,362,907	1,894,621
Wisconsin	3	929,001	1,488,902	....	(1)	(1)
Pennsylvania	18	1,503,725	1,419,140	21	458,946	394,964
Massachusetts	5	843,566	1,378,323	6	493,918	435,114
California	11	729,730	946,123	9	481,647	364,021
Kentucky	3	878,828	890,000	....	(1)	(1)
Missouri	7	451,543	590,777	....	(1)	(1)
Indiana	3	214,320	286,885	3	365,050	295,872
Minnesota	3	218,000	276,482	....	(1)	(1)
Virginia	4	159,319	244,719	....	(1)	(1)
All other states	15	460,352	482,932	24	1,116,096	670,694
Spirit varnishes, not turpentine	153	2,974,118	8,105,537	161	2,964,172	3,080,425
New York	30	1,047,442	2,695,855	30	809,382	811,944
Massachusetts	7	331,589	1,842,935	8	711,774	705,702
New Jersey	16	422,421	940,042	17	128,380	211,306
Illinois	16	226,408	614,215	11	608,528	638,934
Michigan	4	150,121	277,728	7	44,212	48,401
Indiana	7	122,404	277,135	6	69,366	80,337
California	7	95,828	272,214	8	85,003	96,079
Pennsylvania	20	135,386	259,474	25	196,802	180,969
Ohio	16	109,390	242,753	17	97,209	84,001
Missouri	6	97,935	202,242	4	18,026	14,777
Wisconsin	3	48,325	162,346	....	(1)	(1)
Rhode Island	4	33,888	99,206	3	26,674	48,831
Virginia	3	1,526	3,678	....	(1)	(1)
All other states	14	151,455	215,714	16	168,726	159,144
Damar and similar turpentine and benzine varnishes	184	6,356,387	10,273,773	167	3,297,371	2,865,256
Illinois	17	1,282,830	2,374,486	24	680,592	738,051
Ohio	33	1,045,715	1,857,080	27	151,659	172,309
New York	30	1,429,054	1,843,012	28	185,225	205,780
Missouri	5	412,207	642,311	3	78,050	22,891
Kentucky	4	416,447	635,320	3	893,882	743,730
New Jersey	20	318,326	537,918	16	636,665	337,521
Indiana	4	264,310	512,826	6	67,627	65,172
Pennsylvania	27	429,204	492,851	30	309,268	285,705
Massachusetts	7	253,133	437,779	8	58,854	61,227
Michigan	5	199,268	388,161	5	99,296	106,916
California	11	113,642	173,603	5	42,645	29,076
VARNISHES AND JAPANS—Continued.						
Damar and similar turpentine and benzine varnishes—Continued.		*Gallons.*			*Gallons.*	
Maryland	3	65,848	$117,389	....	(1)	(1)
Tennessee	3	1,200	3,225	....	(1)	(1)
All other states	15	125,203	257,812	12	93,608	896,878
Pyroxylin varnishes	10	500,061	923,464	24	852,571	1,308,796
New York	3	14,106	28,124	8	405,858	666,681
All other states	7	485,955	895,340	16	446,713	642,115
Drying japans and dryers	195	5,940,969	5,558,956	203	6,560,406	3,015,907
New Jersey	21	748,191	851,106	21	593,142	364,207
New York	28	594,514	837,135	30	789,772	461,387
Ohio	29	842,920	708,887	39	1,228,184	556,681
Pennsylvania	32	1,024,305	688,713	32	1,610,416	597,503
Illinois	21	822,984	678,713	22	759,252	367,933
Michigan	5	458,678	447,454	7	294,857	151,389
Kentucky	5	457,115	366,484	6	271,593	102,523
Massachusetts	4	240,956	221,805	10	227,111	103,184
California	13	212,936	164,564	6	107,320	43,385
Missouri	8	90,736	110,316	4	76,163	34,654
Wisconsin	3	79,965	100,506	....	(1)	(1)
Indiana	3	91,980	72,353	8	263,716	82,598
Virginia	3	64,000	65,000	....	(1)	(1)
Tennessee	4	13,830	16,730	....	(1)	(1)
All other states	16	197,859	229,190	18	338,880	151,363
Baking japans and lacquers	105	5,375,220	5,877,629	118	4,888,816	2,960,856
New Jersey	9	1,612,972	1,938,558	14	458,539	720,235
Ohio	20	970,759	1,046,705	23	651,432	358,212
New York	16	552,572	836,127	23	1,029,721	772,575
Illinois	13	616,102	736,544	15	201,410	156,227
Michigan	4	818,144	640,604	5	372,631	184,931
Kentucky	3	400,487	300,917	....	(1)	(1)
Pennsylvania	15	112,087	93,031	17	1,410,190	234,457
California	7	106,938	67,589	4	35,807	16,515
Missouri	3	28,270	44,107	3	82,775	19,803
Indiana	3	31,158	15,715	5	288,710	64,625
All other states	12	125,731	157,732	9	407,571	438,276
Other products of the varnish group; asphaltums, brewer's pitch, gloss oils, lithographic varnish, removers, substitutes, varnish stains, etc.	....	.....	16,030,578	....	.....	4,148,617
New York	....	.....	5,601,550	....	.....	.....
New Jersey	....	.....	1,995,542	....	.....	.....
Illinois	....	.....	1,899,477	....	.....	.....
Connecticut	....	.....	1,226,116	....	.....	.....
Michigan	....	.....	1,169,557	....	.....	.....
Massachusetts	....	.....	803,732	....	.....	.....
Ohio	....	.....	747,290	....	.....	(1)
Wisconsin	....	.....	729,936	....	.....	.....
Pennsylvania	....	.....	620,181	....	.....	.....
California	....	.....	230,379	....	.....	.....
Indiana	....	.....	179,356	....	.....	.....
Kentucky	....	.....	54,576	....	.....	.....
All other states	....	.....	772,886	....	.....	.....

[1] Figures not available.

GENERAL TABLES.

Table 14 gives for 1919, 1914, and 1909, by states, the number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products for the industry.

Table 15 presents for 1919 the detailed statistics for the two branches of the industry, paints and varnishes, by states, so far as they can be shown without disclosing the operations of individual establishments.

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

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.		
United States	1919	830	21,507	85,199	$24,118	$217,112	$340,346
	1914	800	16,083	70,611	10,180	88,465	145,624
	1909	791	14,240	56,162	8,271	79,016	124,889
California	1919	46	737	3,734	930	7,682	11,846
	1914	38	392	1,587	310	2,872	4,082
	1909	35	396	1,387	275	2,652	3,758
Georgia	1919	4	37	110	37	207	362
	1914	6	27	322	11	162	225
	1909	7	35	95	16	172	222
Illinois	1919	83	3,178	14,012	3,221	37,502	54,787
	1914	72	2,110	9,908	1,300	15,477	24,489
	1909	74	1,792	7,108	1,114	12,902	20,434
Indiana	1919	23	257	944	236	2,800	4,315
	1914	22	178	793	122	922	1,482
	1909	18	200	521	74	683	1,108
Iowa	1919	4	10	90	16	160	268
	1914	4	25	226	14	94	156
	1909	4	18	170	13	85	154
Maryland	1919	17	263	711	279	2,453	3,466
	1914	9	145	453	82	669	1,028
	1909	12	127	450	55	700	1,001
Massachusetts	1919	33	591	1,644	592	5,673	9,807
	1914	34	490	1,411	301	2,621	4,876
	1909	41	428	1,819	251	2,075	3,469
Minnesota	1919	17	144	652	133	1,782	2,898
	1914	15	144	1,065	98	1,061	1,684
	1909	14	164	420	101	889	1,489
Missouri	1919	37	991	4,388	$1,287	$11,074	$16,559
	1914	34	599	2,775	393	3,740	5,792
	1909	32	685	2,706	366	4,698	6,828
Nebraska	1919	5	58	234	54	682	1,308
	1914	6	67	400	45	624	958
	1909	4	112	425	68	849	1,254
New Jersey	1919	63	1,994	7,321	2,305	20,810	31,815
	1914	60	1,737	7,505	1,071	9,941	16,086
	1909	63	1,493	5,924	844	8,226	12,767
New York	1919	148	3,872	13,838	4,119	39,618	66,244
	1914	150	3,450	14,648	2,282	18,592	31,884
	1909	147	3,047	10,857	1,863	17,895	28,559
Ohio	1919	94	2,929	10,450	3,187	32,307	50,478
	1914	95	2,107	8,721	1,295	11,340	19,327
	1909	87	1,535	5,572	904	8,570	13,617
Pennsylvania	1919	104	3,279	13,866	4,120	25,500	38,845
	1914	114	2,643	11,691	1,591	10,400	16,005
	1909	114	1,992	9,862	1,102	9,201	14,020
Texas	1919	8	52	316	55	515	1,019
	1914	8	35	165	21	159	284
	1909	5	21	67	14	49	84
All other states	1919	144	3,115	12,889	3,547	28,348	46,330
	1914	132	2,024	8,941	1,244	9,783	17,266
	1909	134	2,195	8,779	1,211	9,370	16,125

TABLE 15.—DETAILED STATEMENT,

	STATE.	Number of establishments.	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Clerks, etc. Female.	Wage earners. Average number.	Wage earners. Number, 15th day of— Maximum month.	Wage earners. Number, 15th day of— Minimum month.	WAGE EARNERS DEC. 15, OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	16 and over. Female.	Under 16. Male	Under 16. Female	Capital.
	PAINTS.															
1	United States	601	26,645	226	1,941	4,735	2,258	17,485	De 18,766	Fe 16,070	18,716	16,931	1,724	41	20	$177,314,815
2	California	41	915	17	87	15	80	716	Au 804	Ja [2] 581	762	688	71	3	.....	7,051,672
3	Colorado	7	155	1	13	49	16	76	Ap 84	De 69	73	60	13	.....	.....	1,289,008
4	Georgia	4	94	.....	17	35	5	37	Oc 40	Ja 34	39	36	3	.....	.....	412,611
5	Illinois	50	4,365	15	271	998	441	2,640	De 3,002	Ap 2,482	2,825	2,539	284	2	.....	27,648,999
6	Indiana	17	293	4	37	63	31	158	Se 173	Fe 147	160	136	24	.....	.....	1,284,378
7	Iowa	4	30	.....	8	9	3	10	Jy [2] 11	Ja [2] 8	11	11	.....	.....	.....	203,758
8	Kentucky	13	307	.....	35	58	19	195	Au 223	Ja 159	200	141	59	.....	.....	1,386,528
9	Maryland	14	374	15	29	52	20	258	Au 296	Ja 175	294	258	36	.....	.....	2,142,270
10	Massachusetts	19	418	2	36	78	27	275	De 298	Mh [2] 250	311	286	24	.....	1	2,223,528
11	Michigan	24	1,800	6	119	423	233	1,019	Oct 1,167	Fe 887	1,124	1,004	118	1	1	12,174,996
12	Minnesota	12	244	5	30	72	20	117	Je 128	No 101	112	85	27	.....	.....	1,948,735
13	Missouri	30	1,464	6	108	326	126	898	Se 1,006	Ja 737	927	845	82	.....	.....	9,278,089
14	Nebraska	5	119	.....	16	30	15	58	My 66	Ja 51	53	53	5	.....	.....	891,730
15	New Jersey	33	1,881	10	143	241	155	1,332	No 1,446	Ap 1,230	1,429	1,339	86	2	2	15,175,523
16	New York	97	3,989	38	278	602	236	2,835	No 2,996	Ja 2,564	3,001	2,616	377	2	6	25,031,398
17	Ohio	61	3,569	16	228	788	340	2,197	No 2,379	Ja 1,930	2,349	2,098	251	.....	.....	23,193,526
18	Pennsylvania	88	4,430	54	306	532	344	3,144	Se 3,290	De 2,927	3,313	3,180	102	29	2	31,685,058
19	Tennessee	11	185	4	23	21	11	126	Oc 133	Mh 117	129	119	10	.....	.....	785,796
20	Texas	8	92	5	11	18	6	52	No 62	Ja 38	55	52	3	.....	.....	432,172
21	Virginia	10	162	3	21	21	13	104	Fe 108	My 98	107	106	1	.....	.....	1,088,074
22	Washington	6	53	.....	9	9	6	29	Je 31	Ja 26	32	29	3	.....	.....	373,637
23	West Virginia	4	183	3	15	24	9	132	Au 168	Ap 94	167	96	71	.....	.....	691,060
24	Wisconsin	9	626	5	33	142	74	372	De 75	Fe 313	475	421	44	2	8	5,152,930
25	All other states [3]	34	897	17	68	79	28	705	.....	.....	763	733	30	.....	.....	5,710,343
	VARNISHES.															
1	United States	229	7,385	72	732	1,741	818	4,022	De 4,390	Ja 3,617	4,445	4,028	404	11	2	$62,461,021
2	California	5	42	6	4	7	4	21	De 28	Ja 12	28	23	5	.....	.....	143,808
3	Connecticut	4	41	2	11	11	2	15	No 23	Ja 11	18	18	.....	.....	.....	287,576
4	Illinois	33	1,087	6	111	282	150	538	Oc 588	Fe 471	562	501	59	1	1	8,753,274
5	Indiana	6	205	1	31	50	24	99	De 120	Ja 69	124	114	10	.....	.....	1,291,853
6	Maryland	3	12	5	.....	2	.....	5	(4) 5	(4) 5	5	5	.....	.....	.....	44,966
7	Massachusetts	14	556	3	52	119	66	316	Fe 342	Jy 277	306	272	34	.....	.....	4,097,926
8	Michigan	5	452	1	47	119	92	193	No 222	Ma 169	206	187	19	.....	.....	3,408,004
9	Minnesota	5	51	.....	8	11	5	27	De 29	Ap [2] 26	29	28	1	.....	.....	308,564
10	Missouri	7	141	1	16	26	5	93	Je 108	Mh 71	106	79	26	.....	1	807,625
11	New Jersey	30	1,038	8	87	205	76	662	Oc 756	Fe 569	787	718	67	2	.....	8,343,913
12	New York	51	1,948	20	176	506	209	1,037	De 1,137	Fe 919	1,146	1,051	88	7	.....	22,131,282
13	Ohio	33	1,272	13	107	267	153	732	De 819	Ja 668	819	735	83	1	.....	9,262,919
14	Pennsylvania	16	253	4	45	50	19	135	De 150	Ja 117	150	145	5	.....	.....	1,955,066
15	All other states [5]	16	287	2	37	86	13	149	.....	.....	159	152	7	.....	.....	1,624,245

[1] Includes water wheels and turbines (irrespective of ownership of water supply), and water motors (operated by water from city mains).
[2] Same number reported for one or more other months.
[3] All other states embrace: Alabama, 1 establishment; Connecticut, 5; Delaware, 3; District of Columbia, 1; Florida, 4; Kansas, 5; Louisiana, 2; Maine, 1; New Mexico, 1; North Carolina, 1; Oklahoma, 1; Oregon, 2; Rhode Island, 4; South Carolina, 1; Utah, 2.

BY STATES: 1919.

EXPENSES.										POWER.						
Salaries and wages.				Rent and taxes.		For materials.				Primary horsepower.						
Officials.	Clerks, etc.	Wage earners.	For contract work.	Rent of factory.	Taxes, Federal, state, county, and local.	Principal materials.	Fuel and rent of power.	Value of products.	Value added by manufacture.	Total.	Steam engines and turbines.	Internal-combustion engines.	Water wheels and motors.[1]	Rented (electric).	Electric horsepower generated in establishments reporting.	
PAINTS.																
$7,987,233	$10,282,471	$19,550,371	$689,986	$693,874	$5,638,099	$162,037,931	$3,566,185	$256,714,379	$91,110,263	73,702	33,224	2,462	959	37,057	19,168	1
294,872	307,088	900,199	500,000	38,691	446,964	7,310,948	78,921	11,433,902	4,044,033	3,717	350	29	.....	3,338	.....	2
59,033	63,078	108,129	.....	4,372	51,926	681,825	6,757	1,168,001	479,419	228	.....	.....	.....	228	.....	3
49,615	26,760	36,410	.....	4,713	12,413	204,486	2,745	362,476	155,245	110	.....	.....	.....	110	.....	4
1,200,322	2,110,035	2,650,880	1,708	82,907	592,709	29,040,877	584,636	43,061,694	13,436,181	11,835	4,785	75	.....	6,975	3,621	5
77,304	116,317	135,878	.....	27,736	46,559	1,627,729	12,967	2,419,500	778,804	731	.....	8	.....	723	.....	6
28,521	41,049	16,047	.....	3,748	4,759	157,559	2,067	268,434	108,808	90	.....	.....	.....	90	.....	7
123,228	114,126	155,320	.....	8,590	76,075	1,889,203	10,273	2,786,468	886,992	846	5	30	.....	811	.....	8
100,068	127,961	273,622	.....	6,572	17,081	2,333,567	60,500	3,376,725	982,658	661	215	58	.....	388	.....	9
148,157	203,453	288,626	26	33,938	86,403	2,031,725	40,607	3,647,675	1,575,343	1,087	643	12	.....	432	73	10
449,812	1,034,354	1,275,903	1,667	31,621	478,599	9,460,905	103,437	16,435,155	6,870,813	3,850	1,875	164	.....	1,811	1,214	11
90,846	133,647	118,427	.....	13,294	167,350	1,593,952	17,020	2,512,132	901,160	620	80	.....	.....	540	14	12
407,864	618,312	1,182,022	200	55,796	199,431	9,500,015	218,087	14,531,437	4,813,335	3,905	2,210	.....	.....	1,695	1,011	13
56,415	62,277	54,176	.....	8,268	50,800	677,713	4,505	1,307,556	625,338	234	.....	.....	.....	234	.....	14
560,789	540,806	1,502,511	81,880	23,857	456,406	11,612,339	444,654	18,500,897	6,443,904	5,522	3,869	50	29	1,574	2,126	15
1,374,425	1,486,078	2,984,497	44,495	196,402	653,195	26,723,199	528,477	44,129,831	16,878,155	11,145	6,321	253	140	4,431	2,449	16
1,091,126	1,432,871	2,315,325	24,052	60,091	1,200,986	23,360,149	237,619	36,848,364	13,250,596	8,187	1,520	500	.....	6,167	1,242	17
1,128,459	1,211,734	3,952,211	7,810	51,557	651,719	22,682,083	785,482	35,747,820	12,280,255	13,421	7,219	307	760	5,135	4,669	18
48,276	40,494	99,839	.....	5,075	10,412	1,013,326	16,255	1,520,669	491,088	899	395	.....	.....	504	.....	19
41,908	30,002	54,335	.....	5,840	34,149	508,944	5,636	1,019,069	504,489	316	.....	.....	.....	316	.....	20
78,246	48,555	103,539	1,500	6,010	13,828	685,918	28,127	1,141,775	427,730	393	160	.....	30	203	.....	21
38,400	18,187	37,420	.....	3,080	4,790	263,737	3,350	486,783	219,696	175	.....	.....	.....	175	.....	22
147,900	32,600	101,767	.....	420	31,032	384,866	10,808	864,447	408,773	700	180	210	.....	400	150	23
149,066	333,786	415,286	.....	11,084	255,344	4,911,060	139,125	6,702,258	1,652,073	1,742	1,492	.....	.....	250	799	24
242,531	148,901	788,002	26,648	10,212	95,169	3,381,806	224,130	6,441,311	2,835,375	3,198	[5] 1,905	766	.....	527	1,800	25
VARNISHES.																
$3,694,724	$4,558,200	$4,567,788	$39,899	$196,779	$1,871,008	$50,952,290	$555,966	$83,632,424	$32,124,168	11,497	4,743	111	60	6,583	1,805	1
11,139	12,009	30,389	.....	1,545	2,691	289,720	1,992	412,138	120,426	17	.....	.....	.....	17	.....	2
26,557	23,813	18,574	.....	.....	2,815	141,593	2,613	235,174	90,968	86	35	.....	.....	51	.....	3
559,278	682,254	569,772	18,410	97,711	156,889	7,798,526	77,509	11,725,607	3,849,572	2,177	1,212	15	.....	950	150	4
104,958	132,591	99,177	.....	120	22,811	1,147,765	11,907	1,895,523	735,851	213	85	.....	.....	128	.....	5
.....	2,810	5,304	.....	1,237	1,168	58,212	1,088	89,395	30,095	50	.....	.....	.....	50	.....	6
276,919	300,279	302,933	.....	4,421	380,194	3,569,244	31,802	6,159,199	2,558,153	557	9	.....	.....	548	.....	7
149,327	259,122	268,709	.....	.....	139,505	2,114,125	29,614	4,091,941	1,948,202	553	.....	.....	.....	553	4	8
13,803	21,423	14,402	.....	400	9,754	267,907	3,156	385,610	114,547	32	.....	.....	.....	32	.....	9
73,458	70,046	104,916	.....	2,586	17,646	1,344,122	10,427	2,027,338	672,789	483	255	.....	.....	228	.....	10
546,697	583,501	801,440	14,896	7,106	166,071	8,642,513	110,662	13,314,471	4,561,296	1,799	1,145	.....	60	594	583	11
976,209	1,308,248	1,134,341	3,518	51,645	648,700	12,231,712	134,620	22,113,703	9,747,371	2,693	1,074	24	.....	1,595	387	12
515,337	624,138	870,632	.....	7,715	222,918	8,606,309	102,774	13,629,446	4,920,363	2,263	565	17	.....	1,681	673	13
231,439	200,060	167,239	75	10,144	25,842	2,014,295	18,341	3,097,446	1,064,810	445	321	55	.....	69	.....	14
209,603	337,906	179,960	3,000	12,149	74,004	2,726,247	19,461	4,455,433	1,709,725	129	42	.....	.....	87	8	15

[1] Same number reported throughout year.

[5] All other states embrace: Kansas, 1 establishment; Kentucky, 4; Louisiana, 1; Maine, 2; North Carolina, 1; Oregon, 2; Rhode Island, 2; Tennessee, 1; Virginia, 1; Wisconsin, 1.

LINSEED OIL.

GENERAL STATISTICS.

General character of the industry.—Reports were received at the census of manufactures, 1919, from 26 establishments engaged primarily in the expressing of oil from flaxseed, with cake and meal as by-products. There was also a considerable production of linseed oil reported by establishments in the paint and varnish industry. The production figures aim to cover the total production.

Comparative summary.—Table 16 gives the general statistics for the census years 1899 to 1919, inclusive. At the census of 1879 the industry was represented by 81 establishments, with products valued at $15,394,000; in 1869, 77 establishments with $8,882,000; in 1859, 94 establishments with $5,982,000; and in 1849, 168 establishments with products valued at $1,949,000.

Principal states, ranked by value of products.—Table 17 summarizes the more important statistics for the industry, by states, ranked according to the value of products, New Jersey, which ranks third, being included with "All other states."

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 18 is an estimate obtained by the method described in the "Explanation of terms." Figures for the states will be found in Table 26.

Wage earners, by months.—Table 19 is designed to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Very few females are employed in this industry as wage earners, the average number constituting but 2 per cent of the total number.

Prevailing hours of labor.—As shown in Table 20, the majority of the wage earners fall under the higher groups, over 60 per cent being in the groups "60" and "Over 60" hours per week in 1919, though this proportion is materially less than was the case in 1914, when it was nearly 95 per cent.

Size of establishments, by average number of wage earners.—The figures in Table 21 show a growth in size of establishments for the period 1914–1919, and comparatively few are found in the lower groups. In 1919 the average number of wage earners for all plants was 84, compared with 59 in 1914.

Size of establishments, by value of products.—Measured by value of products, the establishments also are found in the higher groups. No establishment reported in 1919 products less than $100,000, and of the 26 establishments, 2 reported products in excess of $100,000 but less than $500,000; and 2 with products in excess of $500,000, but less than $1,000,000. The remaining establishments, 22 in number, reported products in excess of $1,000,000, aggregating $118,729,553, or 98.4 per cent of the total amount for the industry. These establishments employed 2,119 wage earners, or 97.5 per cent of the total number, and showed value added by manufacture to the amount of $19,756,094, or 98.5 per cent of the total for the industry. In 1914 there were 15 establishments in the "$1,000,000 and over" group, with 1,292 wage earners, products valued at $40,233,000 and value added by manufacture, $4,417,000.

Character of ownership.—Only 2 establishments in 1919 were not under corporate ownership, these being firms. In 1914, of the 25 establishments, 21 were corporations, 1 was owned individually, and 3 were firms.

Number and horsepower of types of prime movers.—Table 22 presents statistics concerning power. Electric power is a growing factor, and in 1919 purchased electric power constituted 46.5 per cent of the primary power, compared with 39.5 per cent in 1914 and 23.7 in 1909. In addition, a considerable portion of the owned power is utilized in electric generation.

Fuel consumed.—Table 23 presents statistics for fuel consumed, by kinds and by states.

TABLE 16.—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	26	25	29	30	48	.....	.....	.....	.....
Persons engaged	2,751	1,998	1,753	1,518	(2)	37.7	14.0	15.5	.....
Proprietors and firm members	4	10	9	13	(2)	.....	.....	.....	.....
Salaried employees	574	500	292	156	285	14.8	71.2	87.2	−45.3
Wage earners (average number)	2,173	1,488	1,452	1,349	1,328	46.0	2.5	7.6	1.6
Primary horsepower	17,621	15,511	13,211	9,473	8,491	13.6	17.4	39.5	11.6
Capital	$73,954,065	$39,872,712	$18,931,829	$9,849,695	$15,460,512	85.5	110.6	92.2	−36.3
Salaries and wages	4,461,672	2,053,286	1,632,474	1,208,943	1,139,558	117.3	25.3	35.0	6.1
Salaries	1,409,403	926,117	739,862	423,309	446,247	52.2	25.2	74.8	−5.1
Wages	3,052,269	1,127,169	892,612	785,634	693,311	170.8	26.3	13.6	13.3
Paid for contract work	6,201	10,242	20,000	.....	(2)	−39.5	−48.8	(2)	(2)
Rent and taxes	1,299,858	140,594	94,520	[3] 50,337	(2)	824.5	48.7	87.8	(2)
Cost of materials	100,577,538	39,555,408	31,034,576	23,153,151	24,395,775	154.3	27.5	34.0	−5.1
Value of products	120,638,100	44,882,538	36,738,694	27,577,152	27,184,331	168.8	22.2	33.2	1.4
Value added by manufacture (value of products less cost of materials	20,060,562	5,327,130	5,704,118	4,424,001	2,788,556	276.6	−6.6	28.9	58.7

[1] A minus sign (−) denotes decrease; percentages are omitted where base is less than 100. [2] Figures not available. [3] Exclusive of internal revenue.

TABLE 17.—PRINCIPAL STATES, RANKED BY VALUE OF PRODUCTS: 1919.

STATE.	Number of establishments.	WAGE EARNERS. Average number.	Per cent distribution.	Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	Per cent distribution.	Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	Per cent distribution.	Rank.
United States	26	2,173	100.0	...	$120,638	100.0	...	$20,060	100.0	...
New York	6	582	26.8	1	35,595	29.5	1	6,208	30.9	1
Minnesota	6	483	22.2	3	$33,238	27.6	2	$4,442	22.1	3
Ohio	3	270	12.4	4	9,369	7.8	4	1,608	8.0	4
All other states	11	838	38.6	...	42,436	35.2	...	7,802	38.9	..

TABLE 18.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	2,751	2,541	210	92.4	7.6
	1914	1,998	(1)	(1)	.....	.....
	1909	1,753	.....	.....	.....	.....
Proprietors and officials	1919	117	116	1	99.1	0.9
	1914	108	(1)	(1)	.....	.....
Proprietors and firm members	1919	4	4	.....	100.0	.....
	1914	10	(1)	(1)	.....	.....
Salaried officers of corporations	1919	48	47	1	97.9	2.1
	1914	40	(1)	(1)	.....	.....
Superintendents and managers	1919	65	65	.....	100.0	.....
	1914	58	(1)	(1)	.....	.....
Clerks and other subordinate salaried employees.	1919	461	295	166	64.0	36.0
	1914	402	(1)	(1)	.....	.....
Wage earners (average number)	1919	2,173	2,130	43	98.0	2.0
	1914	1,488	1,487	1	99.9	0.1
16 years of age and over	1919	2,173	2,130	43	98.0	2.0
	1914	1,488	1,487	1	99.9	0.1

[1] Figures not available.

TABLE 19.—WAGE EARNERS, BY MONTHS, FOR SELECTED 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. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
United States:														
1919	2,173	2,119	1,963	*1,825*	1,907	2,101	2,137	2,465	2,333	2,395	2,211	2,308	2,312	74.0
Males	2,130	2,052	1,905	*1,768*	1,874	2,078	2,114	2,434	2,302	2,365	2,163	2,255	2,256	72.4
Females	43	67	58	63	33	*23*	*23*	31	31	30	48	53	56	34.3
1914	1,488	1,770	1,680	1,614	1,352	1,274	*1,104*	1,118	1,236	1,289	1,733	1,853	1,833	59.6
Minnesota	483	461	453	449	454	*416*	476	577	517	498	500	492	503	72.1
New York	582	631	532	*404*	467	524	568	665	686	740	533	585	649	54.6
Ohio	270	**295**	276	274	268	272	264	269	*248*	255	257	274	288	84.1

TABLE 20.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR SELECTED STATES: 1919.

STATE.	Total.	IN ESTABLISHMENTS WHERE THE PREVAILING HOURS OF LABOR PER WEEK WERE—					
		48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States.....1919..	2,173	288	25	515	.....	904	441
1914..	1,488	1	.....	.....	78	220	1,189
Minnesota.....	483	.....	25	146	.....	248	64
New York.....	582	198	.....	.....	.....	194	190
Ohio.....	270	.....	.....	114	.....	66	90

TABLE 21.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR SELECTED STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—											
			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.	
	Establishments.	Wage earners (average number).	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States.....1919..	26	2,173	1	5	3	41	6	192	8	566	7	1,031	1	338
1914..	25	1,488	1	1	5	81	8	282	7	465	3	401	1	258
Minnesota.....	6	483	.....	.....	.....	.....	2	50	2	137	2	296	.....	.....
New York.....	6	582	.....	.....	.....	.....	1	46	2	153	3	383	.....	.....
Ohio.....	3	270	.....	.....	.....	.....	.....	.....	2	156	1	114	.....	.....

TABLE 22.—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.....	223	158	116	17,621	15,511	13,211	100.0	100.0	100.0
Owned.....	34	54	57	9,425	9,389	10,080	53.5	60.5	76.3
Steam engines (not turbines).....	33	51	54	9,175	9,024	9,720	52.1	58.2	73.6
Internal-combustion engines.....	.....	2	2	.....	115	160	.....	0.7	1.2
Water wheels, turbines, and motors.....	1	1	1	250	250	200	1.4	1.6	1.5
Rented—Electric.....	189	104	59	8,196	6,122	3,131	46.5	39.5	23.7
Electric.....	312	162	110	10,875	8,289	3,931	100.0	100.0	100.0
Rented.....	189	104	59	8,196	6,122	3,131	75.4	73.9	79.6
Generated by establishments reporting.....	123	58	51	2,679	2,167	800	24.6	26.1	20.4

TABLE 23.—FUEL CONSUMED, BY STATES: 1919.

STATE.	COAL.		Coke (tons, 2,000 lbs.).	Gas (1,000 cubic feet).
	Anthracite (tons, 2,240 lbs.).	Bituminous (tons, 2,000 lbs.).		
United States.....1919..	31,893	73,871	85	757
1914..	13,660	85,402	131	26,447
Minnesota.....	3,500	22,414	.....	.....
New York.....	22,393	.....	.....	.....
Ohio.....	.....	15,292	85	.....
All other states.....	6,000	36,165	.....	757

SPECIAL STATISTICS.

Table 24 presents the statistics for materials and products for the census year 1919. Detailed statistics of production were not reported at the prior censuses.

TABLE 24.—MATERIALS AND PRODUCTS: 1919.

[Tons, 2,000 pounds.]

MATERIAL AND PRODUCT.	Value.
MATERIALS.	
Total cost	$100,577,538
Flaxseed:	
Consumption, tons	631,458
Linseed-oil mills—	
Tons	604,258
Cost	$89,584,459
Average unit cost, ton	$148.25
Estimated consumption by establishments in other industries, manufacturing linseed oil, tons	27,200
Other oil materials (not flaxseed), copra, castor beans, etc., cost	$6,143,670
Fuel and rent of power, cost	$669,479
All other materials, cost	$4,179,930
PRODUCTS.	
Total value	$124,494,503
Linseed-oil industry, all products	120,638,100
Subsidiary products of other industries (paint and varnish)	3,856,403
PRODUCTS—continued.	
Linseed oil:	
Raw oil—	
Total production, gallons	55,121,234
For sale—	
Gallons	32,243,931
Value	$50,847,956
Produced for consumption (including boiling) in same establishment, gallons	22,877,303
Boiled oil—	
Gallons	22,156,323
Value	$36,762,221
Linseed cake—	
Tons	244,803
Value	$15,819,433
Linseed meal—	
Tons	164,338
Value	$10,615,777
Vegetable oils, other than linseed (products of linseed-oil mills):[1]	
Gallons	6,997,972
Value	$9,388,802
All other products, value	$1,060,314

[1] Includes the following vegetable oils, products of linseed-oil mills (not total production of same): Coconut or copra, 4,363,953 gallons, valued at $6,176,845; castor, 540,927 gallons, valued at $951,157; soya bean, 212,102 gallons, valued at $399,526; peanut, 188,270 gallons, valued at $313,419; other, and unclassified vegetable oils, 1,692,720 gallons, valued at $1,547,855; total, 6,997,972 gallons, valued at $9,388,802.

The statistics given in the report on "Animal and Vegetable Fats and Oils, 1919," for linseed-oil production and flaxseed consumption, compiled from quarterly reports, exceed somewhat the figures given in the above table. The consumption of flaxseed, 1919, as given in said report, was 691,737 net tons, and the production of linseed oil 58,821,792 gallons, which amount of linseed oil exceeds the quantity reported for the census of manufactures by 6.7 per cent. This may be due to duplications in certain quarterly reports or possibly to establishments that made and consumed linseed oil, without marketing any of the product, and not being reported as manufacturers thereof.