DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS

WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES

MANUFACTURES: 1919

CHEMICALS

SULPHURIC, NITRIC, AND MIXED ACIDS, AND COAL-TAR PRODUCTS

TOGETHER WITH

THE COKE AND SALT INDUSTRIES

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EXPLANATION OF TERMS.

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

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

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

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

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

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

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

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

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

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

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

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

Salaries and wages.—Under these heads are given the total payments during the year for salaries and wages, respectively. The Census Bureau has not undertaken to calculate the average annual earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages, and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calculate accurately even so simple an average as this, since the number of wage earners fluctuates from month to month in every industry, and in some cases to a very great extent. The Census Bureau's figures for wage earners, as already explained, are averages based on the number employed on the 15th of each month, and while representing the number according to the pay rolls to whom wages were paid on that date, no doubt represent a larger number than would be required to perform the work in any industry if all were continuously employed during the year.

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

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

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

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

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

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

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

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

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

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

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

CONTENTS.

CHEMICALS; SULPHURIC, NITRIC, AND MIXED ACIDS; AND COAL-TAR PRODUCTS;

TOGETHER WITH

THE COKE AND SALT INDUSTRIES.

The statistics for the industries Chemicals; Sulphuric, nitric, and mixed acids; and Coal-tar products are here presented as a group on account of the extensive overlapping of products, and following these industries are presented the statistics for the Coke and Salt industries, which supply important basic materials for the group.

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." 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 towards 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 establish-

ments 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	2,327,354	170.0	46.9	51.2	74.4
Wages	72,848,324	22,066,212	14,095,923	10,818,758	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	9,030	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	23,562	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	23,661	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 Virgin a	534	562	517	480	472	*452*	478	527	567	624	**635**	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	2,609	479	48
	1914	4,503	(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	6,276	(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	6,198	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	1,938
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	1,395	.....	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	6,686,778	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 other." [2] Includes the group "indfviduals." [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. 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	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	95,439	5,210	358	23,966
	1914	125,066	363,440	75,062	7,344	(2)	31,440
Ohio	1919	596	714,592	96,108	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	.....	1,426,406
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	29,897	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	81.6
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	109.0	−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	$835,630	$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	$225,878,834	$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 descrease.

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	5,044	110,113
PYRITE.				
Total, tons	1,146,958	8,757,002	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

INDUSTRY.	1919		1914	
	Quantity.	Cost.	Quantity.	Cost.
NITRATE OF SODA.				
Total, tons	418,371	$31,233,537	412,748	$19,264,181
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	448,898
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	1,061,324	436,509
Explosives	39,884	167,447		
Paint and varnish	2,985,735	1,724,112		
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	987,451	422,122
Paint and varnish	244,561	303,998		
Druggists' preparations	73,208	106,147		
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	$150,580,149
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	22,954,989
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, aluminum, and compounds	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	$26,068,017
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	$1,751,632	$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	5,373,057	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	86,992	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	[2] 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	[3] 133,655	62,354	[3] 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	1,794,985		
For sale—			
Pounds	1,213,861		
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	2,102,256
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	845,065	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, Hydrochloric	Brines from mines and lakes.
Hydrocyanic, Hydroferrocyanic	Gas, coke, and beet sugar industries.
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, Caprionic	Similar to lactic.
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.

	TONS (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	282,450	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.

	TONS (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		839,780	$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	134,056		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	403,980	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	158,957	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	3,402,946	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	490,885	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, 570,169 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	463
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	8,823
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	$107,201
Made and consumed, tons	3,169	.....
Pennsylvania	5,083	.....
For sale—		
Tons	980	500
Value	$211,945	$44,060
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	32,636	.....
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	$520,799	$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	$495,930
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	47,053,291	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	5,551,063	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	56,923,770
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	$1,941,893
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	$266,801	(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, $4,693,590 (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	(3)
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	(3)	(3)
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	$31,195,149	$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	106,591	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	82,803
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	(3)	(3)
Value	$685,500	.....	.....
Fluoride—			
Number of establishments	4	.....	.....
Pounds	1,364,441	(3)	(3)
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	(3)	(3)
Value	$103,868	.....	.....

(See foot notes 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	$853,5[illegible]8	$540,282
Unit value, ton	$109	$55	$44
Made and consumed, tons	1,516		
Silicate—			
Number of establishments	17	13	
Tons	286,791	169,049	34,170
Value	$3,052,318	$1,648,854	$366,621
Unit value, ton	$21	$10	$11
Sulphates—			
Niter cake—			
Number of establishments	38	31	24
Total production, tons	97,826	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	110,2[illegible]3	
For sale—			
Tons	122,908	90,442	(3)
Value	$1,630,139	$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	$512,4[illegible]4
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	20,2[illegible]3	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	$71,621	$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	17		6	7	1				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, $32,625,335, and 1909, $25,048,019, are not comparable with total for 1919. The total for 1909 ($25,048,019) includes $3 3 7 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, weighting.
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. Seven 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.—Seventeen establishments in nine states produced 286,791 tons of silicate of soda, none being used for further processes in the same works. Indiana, Ohio, New Jersey, Illinois, and Pennsylvania in the order named produced nearly 84 per cent of the total, two states in the far west (California, Washington), produced less than 6 per cent, four in the middle west 61 per cent and three on the east coast 33 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 aid 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, burnt 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	$1,419,435	$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 electrolyzed	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:	
Electrolyzed	Abrasives.
Cryolite:	
Roasted, etc	Refined cryolite.
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	$1,425,917	$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	$2,257,282	$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.

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	117,470,901		
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	$8,670,277		
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	3,690,757		
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] See report of United States Tariff Commission, Census of dyes and coal-tar chemicals, 1919, for detailed statistics of production.

[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	$2,317,605	.....
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	$2,320,685	$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	$1,820,446	$177,459
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	(2)	(2)
Total production, gallons	241,254		
For sale—			
Gallons	141,535		
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	79,677,490
Value	$2,961,583	$2,278,976	$11,752,580
Unit value, pound	$0.14	$0.14	
Made and consumed in soap industry, pounds	38,350,994	.....	
Refined—			
Number of establishments	31	.....	
Total production, pounds	69,464,298	60,944,799	
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	120,619	(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	(1)	(1)
Total production, pounds	15,469,567		
For sale—			
Pounds	11,606,193		
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	(1)	(1)
Total production, pounds	5,780,549		
For sale—			
Pounds	2,657,947		
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	(1)	(1)
Pounds	43,153		
Value	$30,856		
Other—methyl ether, etc	$22,570	(1)	(1)
Halogen compounds:			
Carbon tetrachloride—			
Number of establishments	5	(1)	(1)
Total production, pounds	11,908,704		
For sale—			
Pounds	9,811,779		
Value	$803,648		
Made and consumed, pounds	2,096,925		
Chloroform—			
Number of establishments	6	.....	.....
Pounds	1,677,641	1,333,954	1,809,685
Value	$516,625	$295,317	$477,538
Unit value, pound	$0.31	$0.22	$0.26
Ethyl chloride—			
Number of establishments	6	(1)	(1)
Pounds	248,103		
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	(1)	(1)
Gallons	99,692		
Value	$127,831		
Methyl ethyl ketone (methyl acetone)—			
Number of establishments	6	(1)	(1)
Pounds	1,158,032		
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	(1)	(1)
Pounds	103,466		
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	$85,319		
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	$1,598,844	$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	28,817	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	$3,592,793	(1)
Organic, acetate, iron ferrocyanide, oxalate, valerate	$661,975		
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	$891,561
Unit value, ton	$52.07	$36.61	$35.28
Chloride (red and yellow)—			
Number of establishments	8		
Total production, pounds	4,648,066		
For sale—			
Pounds	2,353,807	(1)	(1)
Value	$124,088		
Made and consumed, pound	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.[3]	$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	40,786,886	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	641,645
Zinc	5,449,710	Lithium	502,542
Copper	4,671,656	Strontium	316,373
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 Illinois, 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 blue-stone, 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 that are produced in smaller 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, chromium, 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		29,661,949
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) 9; 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	1,263	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	18,563	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	1,165	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	15,062	9	667	1,165	749	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	27,230,017

[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.										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.*								
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
283,367	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	3,986	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	10,676	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	1,896,682	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; West Virginia, 7; 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.			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	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.		CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.	
					Male.	Female.						Male.	Female.
All classes	1919	5,860	5,627	233	96.0	4.0	Clerks and other subordinate salaried employees.	1919	605	407	198	67.3	32.7
	1914	3,604	3,528	76	97.9	2.1		1914	405	330	75	81.5	18.5
	1909	2,582	2,547	35	98.6	1.4		1909	224	190	34	84.8	15.2
Proprietors and officials [1]	1919	294	285	9	96.9	3.1	Wage earners (average number)	1919	4,961	4,935	26	99.5	0.5
	1914	135	135	.....	100.0	.....		1914	3,064	3,063	1	100.0	(2)
	1909	106	106	.....	100.0	.....		1909	2,252	2,251	1	100.0	(2)
Salaried officers of corporations	1919	40	40	.....	100.0	.....	16 years of age and over	1919	4,959	4,933	26	99.5	0.5
	1914	35	35	.....	100.0	.....		1914	3,064	3,063	1	100.0	(2)
	1909	27	27	.....	100.0	.....		1909	2,249	2,248	1	100.0	(2)
Superintendents and managers	1919	254	245	9	96.5	3.5	Under 16 years of age	1919	2	2	.....	100.0	.....
	1914	100	100	.....	100.0	.....		1914	.....	.....	.....	.....	.....
	1909	79	79	.....	100.0	.....		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	5,401	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	568	588	*494*	498	73.7
Illinois	875	927	878	804	*711*	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	.....	6	21	.....	104	303	.....	291,993	1,239,949	.....	131,082	536,393
$5,000 to $20,000	2			9			27,362			15,425		
$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	.....	18.8	50.0	.....	3.4	13.5	.....	1.9	12.5	.....	1.6	11.9
$5,000 to $20,000	5.1			0.2			0.1			0.1		
$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	196,953
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	5,956	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.	STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.								Expressed in thousands.		
United States	1919	39	4,961	30,637	$7,917	$15,857	$31,470	All other states	1919	34	4,400	29,486	$7,041	$14,261	$28,666
	1914	32	3,064	24,927	2,213	6,734	15,215		1914	26	2,155	21,518	1,516	4,574	10,144
	1909	42	2,252	6,494	1,495	5,386	9,884		1909	36	1,818	4,919	1,213	4,324	7,756
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								

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	5,869	.....	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	.....	3,038,642	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	.....	298,087	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	329,839	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 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	3	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.	Value 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	$174,991,835	$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	631	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	.....	.....	.....	235,988	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	233	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.
									Total.	Owned.			Rented.	
	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	$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	136,859	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	525,693	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 comprise: 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 corporation 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	6,644,722	28.6	71.4
						Cost of materials	224,266,674	78,155,895	146,110,779	34.8	65.2
Primary horsepower	224,879	39,761	185,118	17.7	82.3	Value of products	316,515,838	112,023,466	204,492,372	35.4	66.6
Capital	$365,249,622	$137,906,875	$227,342,747	37.8	62.2	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

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.
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
Proprietors 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*	3,202	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	*195*	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	.....	706	.....	.....	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	18,230,933
	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	75	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	68,262,904	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	965,877	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	28,064	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	3,158,168	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	491	7,327	148	6.2	91.9	1.9	70,169,342	5,975,411	63,156,278	1,037,553	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	5,910	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	3,960	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	.....	2,306
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.

[Tons, 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

	1919	1914	1909
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	288,808,764		
Sales—			
Gallons	217,980,143	109,901,315	60,126,006
Value	$6,910,265	$2,867,274	$1,408,611
Ammonia (sales)—			
Sulphate—			
Pounds	557,619,631	170,763,906	
Value	$21,075,718	$4,696,590	
Anhydrous or free ammonia [2]—			$3,675,771
Pounds	51,646,744		
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. Total.	A	B	PERSONS ENGAGED IN THE INDUSTRY. Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks, etc. Male.	Female.	Wage earners. Average number.	Number, 15th day of— Maximum month.	Minimum month.	WAGE EARNERS DEC. 15 OR NEAREST REPRESENTATIVE DAY. Total.	16 and over. Male.	Female	Under 16. Male.	Capital.	EXPENSES. Salaries and wages. 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	46,317
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	613	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	1,433,758
Tennessee	6	5	1	290	1	10	6	1	272	Ja 302	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. Salaries and wages—Continued. Clerks, etc.	Wage earners.	For contract work.	Rent and taxes. Rent of factory.	Taxes, Federal, state, county, and local.	For materials. Principal materials.	Fuel and rent of power.	Value of products.	Value added by manufacture.	POWER. Primary horsepower. Total.	Owned. Steam engines (not turbines).	Steam turbines.	Internal-combustion engines.	Rented electric.	Electric horsepower generated in establishments reporting.
United States	$3,936,077	$12,299,292	$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)	1,473,050	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	.....	.....	13,991
Kentucky	74,116	759,581	.....	.....	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	940,702	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	2,016,858	553,219	2,345	2,220	125	.....	.....	1,242
Virginia	66,302	1,084,572	.....	61,754	67,265	199,992	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	8,308,698	2,331,460	9,493	3,829	.....	.....	5,664	620
All other states[1]	776,415	8,917,454	2,138	224,324	4,442,629	4,786,545	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	8,470	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. 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	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	7,082	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. January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Per cent minimum is of maximum.
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	5,820	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	*4,840*	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	*1,923*	1,981	1,926	2,016	2,060	2,178	2,125	2,143	2,169	**2,755**	69.8
New York	1,728	1,630	*1,608*	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		8,363,886		4,442,790	
$500,000 to $1,000,000	10	2	1,139	4,326	6,822,518	12,626,567	4,226,187	6,936,215
$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		22.3		20.7	
$500,000 to $1,000,000	11.6	2.6	17.5	85.0	18.2	89.7	19.7	89.0
$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	85,804	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	.....	471,402	.....	.....	.....	.....	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:			
Products, total value	$37,513,821	$14,070,333	$11,327,834	Pounds	1,854,071	576,991	569,725
Salt:				Value	$1,234,969	$203,094	$57,600
Tons (2,000 pounds)	6,882,002	[1] 4,872,656	4,195,628	Average value, pound	$0.67	$0.35	$0.10
Value	$27,074,694	$10,271,358	$8,311,729	Calcium chloride: [2]			
Average value, ton	$3.93	$2.11	$1.89	Tons (2,000 pounds)	26,123	19,403	12,853
				Value	$321,596	$121,766	$63,198
				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	2,539	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	4,937	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	21	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	1,985
	1914	12	261	1,021	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. 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	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	$1,211,439
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. 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.[3]	Rented.[4]	Electric horsepower generated in establishments reporting.
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).

DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS

WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES

MANUFACTURES: 1919

CHOCOLATE AND COCOA PRODUCTS

AND

CONFECTIONERY AND ICE CREAM

Prepared under the supervision of EUGENE F. HARTLEY, Chief Statistician for Manufactures

CONTENTS

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EXPLANATION OF TERMS.

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

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

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

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

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

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

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

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

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

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

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

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

Salaries and wages.—Under these heads are given the total payments during the year for salaries and wages, respectively. The Census Bureau has not undertaken to calculate the average annual earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages, and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calculate accurately even so simple an average as this, since the number of wage earners fluctuates from month to month in every industry, and in some cases to a very great extent. The Census Bureau's figures for wage earners, as already explained, are averages based on the number employed on the 15th of each month, and while representing the number according to the pay rolls to whom wages were paid on that date, no doubt represent a larger number than would be required to perform the work in any industry if all were continuously employed during the year.

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

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

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

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

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

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

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

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

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

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

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

CHOCOLATE AND COCOA PRODUCTS.

GENERAL STATISTICS.

General character of the industry.—This report presents separately statistics for two industries: (1) Chocolate and cocoa products and (2) confectionery and ice cream. The first part of the report covers data collected from establishments engaged primarily in the manufacture of chocolate and cocoa products. This industry is confined to ten states; three of which—Pennsylvania, New York, and Massachusetts—reported 82.3 per cent of the total value of products.

Importance and growth of the industry.—Table 1 summarizes the statistics for chocolate and cocoa products for the censuses of 1914 and 1919 with percentages of increase. With one exception, increases are noticeable. The large increases, however, in salaries and wages, cost of materials, and value of products are due largely to a general rise of prices and wages following the World War, and do not, therefore, fairly measure the growth of the industry for that period. A truer index of the conditions is found in the increases in the average number of wage earners and primary horsepower. The addition of Federal income tax since 1919 will account for the increase in "Rent and taxes." Contract work, or work performed by employees other than those in the plants reporting, has little significance, since it represents merely the methods of manufacture used by establishments, which vary from year to year.

States, ranked by value of products.—Pennsylvania, as shown by Table 2, leads in the manufacture of chocolate and cocoa products. This state reported 35.6 per cent of the total number of wage earners and 34.9 per cent of the total value of products.

Persons engaged in the industry.—The classification, by sex, for 1919 was reported separately, but for 1914 was obtained in the same manner as the distribution by age. The age classification of average number of wage earners in Table 3 is an estimate obtained by the method described in the "Explanation of terms." Figures by states will be found in Table 14.

Wage earners, by months.—As shown by Table 4 the number of wage earners employed in the industry month by month ranged from a maximum of 10,034 in October to a minimum of 8,200 in May, the minimum number being equivalent to 81.7 per cent of the maximum. Figures are given for the states separately.

Prevailing hours of labor.—Table 5 shows 46.4 per cent of the wage earners as employed less than 54 hours per week; while the groups "60" and "Over 60" constituted only 4.8 per cent of the total number.

Size of establishments, by average number of wage earners.—Analysis of Table 6 discloses the fact that 7 establishments, or 14.6 per cent of the total number for the industry, employed fewer than 6 wage earners each, while only 19 wage earners, or 0.2 per cent of the total number, were employed therein. On the other hand, the classes "501 to 1,000" and "Over 1,000" wage earners, comprising 5 establishments, employed 4,890 wage earners, or 53.8 per cent of the total average number, illustrating the extent of manufacturing operations in a few large establishments.

Size of establishments, by value of products.—At the census of 1914 establishments with products valued at "$100,000 to $1,000,000" constituted one group, but at the census of 1919 this group was subdivided into "$100,000 to $500,000" and "$500,000 to $1,000,000." Separate figures for the number of establishments and value of products have been compiled, however, from the returns for 1914. Table 7, therefore, gives combined figures for these two groups in case of average number of wage earners and value added by manufacture for 1914. The statistics in this table show the degree of concentration of production in large establishments. In 1919 the groups "$500,000 to $1,000,000" and "$1,000,000 and over" included 34 establishments, or 70.8 per cent of the total number for the industry, employed 8,922 wage earners, or 98.3 per cent of the total average number, and reported products to the value of $137,103,365, or 98.5 per cent of the total value of products.

Character of ownership.—Table 8 emphasizes the predominance of the corporate form of ownership in the chocolate and cocoa products industry. Corporations owned 83.3 per cent of the total number of establishments in 1919, employed 96.6 per cent of the total average number of wage earners, and reported 94.2 per cent of the value of products. During the five-year period, 1914–1919, the average number of wage earners in corporations increased 4,857, or 124.1 per cent, and the value of products $98,196,031, or 297.8 per cent.

Number and horsepower of types of prime movers.—From 1914 to 1919, as shown by Table 9, there was an increase in the total horsepower for the industry of 13,704 horsepower, or 69.4 per cent, due principally to an increase of 13,188 horsepower, or 455.4 per cent, in rented power during this five-year period.

Fuel consumed.—Table 10 shows the principal kinds of fuel used for the industry in 1919 and 1914.

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	48	36	27	25	24	.....	.....	.....	.....
Persons engaged	10,287	5,059	3,404	2,396	1,623	103.3	48.6	42.1	47.6
Proprietors and firm members	21	20	10	15	20	.....	.....	.....	.....
Salaried employees	1,183	879	568	291	289	34.6	54.8	95.2	0.7
Wage earners (average number)	9,083	4,160	2,826	2,090	1,314	118.3	47.2	35.2	59.1
Primary horsepower	33,440	19,736	10,593	7,204	2,756	69.4	86.3	47.0	161.4
Capital	$60,674,737	$23,684,636	$13,685,446	$8,378,980	$6,899,732	156.2	73.1	63.3	21.6
Salaries and wages	13,308,533	3,489,070	2,238,795	1,285,082	896,938	281.4	55.8	74.2	43.3
Salaries	4,038,456	1,453,472	970,182	463,231	371,063	177.8	49.8	109.4	24.8
Wages	9,270,077	2,035,598	1,268,613	821,851	525,875	355.4	60.5	54.4	56.3
Paid for contract work	1,463	71,955	3,361	.....	.....	−98.0	2,040.9	.....	.....
Rent and taxes	6,037,510	287,398	170,346	[2] 138,425	[2] 107,498	2,000.7	68.7	23.1	28.8
Cost of materials	101,754,466	24,483,303	15,523,060	9,722,555	6,876,682	315.6	57.7	59.7	41.4
Value of products	139,258,296	35,712,810	22,390,222	14,389,699	9,666,192	289.9	59.5	55.6	48.9
Value added by manufacture[3]	37,503,830	11,229,507	6,867,162	4,667,144	2,789,510	234.0	63.5	47.1	67.3

[1] A minus sign (−) denotes decrease. [2] Exclusive of internal revenue. [3] 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	48	9,083	100.0	.....	$139,258	100.0	.....	$37,504	100.0	.....
Pennsylvania	10	3,231	35.6	1	48,660	34.9	1	16,398	43.7	1
New York	14	2,311	25.4	2	30,863	22.2	2	8,123	21.7	2
Massachusetts	6	2,007	22.1	3	30,327	21.8	3	6,338	16.9	3
New Jersey	8	489	5.4	4	10,813	7.8	4	1,536	4.1	6
California	4	252	2.8	7	5,663	4.1	5	1,858	5.0	4
All other states	6	793	8.7	.....	12,932	9.3	.....	3,251	8.7	.....

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	10,287	7,449	2,838	72.4	27.6
	1914	5,059	3,518	1,541	69.5	30.5
Proprietors and officials	1919	300	283	17	94.3	5.7
	1914	116	114	2	98.3	1.7
Proprietors and firm members	1919	21	21	.....	.....	.....
	1914	20	19	1	95.0	5.0
Salaried officers of corporations	1919	112	110	2	98.2	1.8
	1914	49	49	.....	.....	.....
Superintendents and managers	1919	167	152	15	91.0	9.0
	1914	47	46	1	97.9	2.1
Clerks and other subordinate salaried employees	1919	904	611	293	67.6	32.4
	1914	783	646	137	82.5	17.5
Wage earners (average number)	1919	9,083	6,555	2,528	72.2	27.8
	1914	4,160	2,758	1,402	66.3	33.7
16 years of age and over	1919	8,990	6,520	2,470	72.5	27.5
	1914	4,098	2,730	1,368	66.6	33.4
Under 16 years of age	1919	93	35	58	37.6	62.4
	1914	62	28	34	45.2	54.8

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 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	9,083	8,723	9,103	9,064	8,713	*8,200*	8,403	8,898	9,137	9,593	**10,034**	9,826	9,302	81.7
Males	6,555	6,101	6,397	6,442	6,276	*5,976*	6,194	6,431	6,668	6,962	**7,213**	7,120	6,880	82.9
Females	2,528	2,622	2,706	2,622	2,437	2,224	*2,209*	2,467	2,469	2,631	**2,821**	2,706	2,422	78.3
1914	4,160	4,180	4,242	4,208	4,260	4,109	3,978	*3,619*	3,777	4,355	**4,512**	4,389	4,201	80.2
California	252	258	262	270	**282**	270	263	*221*	231	240	239	243	245	78.4
Massachusetts	2,007	1,969	2,020	2,080	2,030	*1,844*	1,870	2,127	2,053	**2,144**	2,111	1,949	1,887	86.0
New Jersey	489	461	483	469	467	*435*	476	499	481	505	**535**	531	526	81.3
New York	2,311	2,071	2,286	2,218	2,162	*2,037*	2,121	2,280	2,376	2,525	**2,735**	2,684	2,247	74.1
Pennsylvania	3,231	3,228	3,295	3,207	2,959	*2,851*	2,895	3,010	3,211	3,412	3,572	**3,576**	3,556	79.7

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	9,083	8	11	3,338	859	673	3,753	248	193
1914	4,160	(2)	(2)	21	514	644	2,102	879	.....
California	252	.....	.....	60	.....	166	.....	.....	.....
Massachusetts	2,007	.....	.....	1,900	.....	107	.....	.....	.....
New Jersey	489	.....	.....	.....	204	.....	285	.....	.....
New York	2,311	7	.....	1,110	107	.....	958	129	.....
Pennsylvania	3,231	1	4	268	480	.....	2,166	119	193

[1] Includes 48 and under for 1914.

[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 150 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	48	9,083	.....	7	19	4	47	10	355	8	543	8	1,143	6	2,086	4	2,958	1	1,932
1914	36	4,160	2	4	8	6	95	8	292	3	206	11	1,807	.....	.....	1	592	1	1,160
California	4	252	.....	.....	.....	1	14	2	72	.....	.....	1	166	.....	.....	.....	.....	.....	.....
Massachusetts	6	2,007	.....	1	1	.....	.....	.....	.....	.....	.....	2	287	1	255	2	1,464	.....	.....
New Jersey	8	489	.....	2	7	.....	.....	2	67	2	152	2	203	.....	.....	.....	.....	.....	.....
New York	14	2,311	.....	2	6	1	20	4	130	4	261	.....	.....	1	400	2	1,494	.....	.....
Pennsylvania	10	3,231	.....	2	5	.....	.....	1	50	1	69	3	427	2	748	.....	.....	1	1,932

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	48	36	9,083	4,160	$139,258,296	$35,712,810	$37,503,830	$11,229,507
Less than $5,000	.....	2	.....	.....	.....	.....	.....	.....
$5,000 to $20,000	3	2	5	.....	19,541	.....	11,127	.....
$20,000 to $100,000	4	2	17	[1] 22	149,478	[1] 102,009	41,420	[1] 36,770
$100,000 to $500,000	7	14	139	1,070	1,985,912	3,331,463	432,049	1,950,061
$500,000 to $1,000,000	10	6	452		6,899,681	4,082,623	1,843,101	
$1,000,000 and over	24	10	8,470	3,068	130,203,684	28,196,715	35,176,133	9,212,676
	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	.....	5.6	.....	.....	.....	.....	.....	.....
$5,000 to $20,000	6.2	5.6	0.1	.....	(2)	.....	(2)	.....
$20,000 to $100,000	8.3	5.6	0.2	0.5	0.1	0.3	0.1	0.3
$100,000 to $500,000	14.6	38.9	1.5	25.7	1.4	9.3	1.2	17.1
$500,000 to $1,000,000	20.8	16.6	5.0		5.0	11.4	4.9	
$1,000,000 and over	50.0	27.8	93.3	73.8	93.5	79.0	93.8	82.3

[1] Includes the groups "Less than $5,000" and "$5,000 to $20,000."

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

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

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
All classes	1919	48	9,083	$139,258,296
	1914	36	4,160	35,712,810
Individual	1919	3	.....	.....
	1914	4	61	1,497,514
Corporation	1919	40	8,770	131,159,108
	1914	27	3,913	32,963,077
All other	1919	5	[1] 313	[1] 8,099,188
	1914	5	186	1,252,219

CHARACTER OF OWNERSHIP.	Census year.	Number of establishments.	Average number of wage earners.	Value of products.
Per cent distribution:				
Individual	1919	6.2	.....	.....
	1914	11.1	1.5	4.2
Corporation	1919	83.3	96.6	94.2
	1914	75.0	94.1	92.3
All other	1919	10.4	3.4	5.8
	1914	13.9	4.5	3.5

[1] Includes the group "Individual."

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

POWER.	NUMBER OF ENGINES OR MOTORS.		HORSEPOWER.			
			Amount.		Per cent distribution.	
	1919	1914	1919	1914	1919	1914
Primary power, total	1,245	335	33,440	19,736	100.0	100.0
Owned	74	82	17,356	16,840	51.9	85.3
Steam engines	52	59	15,273	14,410	45.7	73.0
Internal-combustion engines	8	9	1,783	2,150	5.3	10.9
Water wheels, turbines, and motors	14	14	300	280	0.9	1.4

POWER.	NUMBER OF ENGINES OR MOTORS.		HORSEPOWER			
			Amount.		Per cent distribution	
	1919	1914	1919	1914	1919	1914
Rented	1,171	253	16,084	2,896	48.1	14.7
Electric	1,171	253	16,058	2,836	48.0	14.4
Other	.....	.....	26	60	0.1	0.3
Electric	2,230	877	24,552	12,875	100.0	100.0
Rented	1,171	253	16,058	2,836	65.4	22.0
Generated by establishments reporting	1,059	624	8,494	10,039	34.6	78.0

TABLE 10.—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	38,562	100,744	1,966	33,137	1,244	40,021
1914	25,486	57,644	300	8,008	(1)	6,519
California	.....	.....	1,203	9,279	860	1,538
Massachusetts	3,359	18,861	.....	.....	.....	24,976
New Jersey	2,639	1,169	18	3	144	6,124
New York	18,313	12,723	277	.....	.....	615
Pennsylvania	8,981	67,640	420	23,855	240	3,626

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Detailed statistics of materials.—Table 11 gives in detail the cost and quantity of the principal materials used in the manufacture of chocolate and cocoa.

Detailed statistics of products.—Table 12 gives in detail the kind and value of chocolate and cocoa products manufactured.

TABLE 11.—DETAILED STATISTICS OF QUANTITY AND COST OF MATERIALS: 1919.

STATE.		All materials, including mill supplies containers, etc. (other than fuel and rent of power).	COMPONENT MATERIALS REPORTED.						
			Total.	Cocoa—			Sugar.	Nuts.	Flavors.	Other.
				Beans.	Butter.	Powder.				
United States	Pounds	.....	.....	323,765,152	6,132,671	967,599	132,051,335	7,914,928	.....	.....
	Value	$100,317,208	$88,896,692	$65,153,297	$2,208,925	$206,789	$12,372,836	$2,497,407	$604,344	$5,853,094
California	Pounds	.....	.....	10,226,724	430,955	213,391	8,045,590	14,884	.....	.....
	Value	$3,754,700	$3,328,167	$2,143,802	$175,798	$38,410	$797,070	$6,932	$11,607	$154,548
Massachusetts	Pounds	.....	.....	102,502,847	73,851	3,500	27,387,664	1,207,710	.....	.....
	Value	$23,697,564	$21,035,323	$17,764,553	$29,421	$900	$2,601,826	$201,271	$137,491	$299,861
New Jersey	Pounds	.....	.....	39,755,647	522,858	517,511	4,273,735	296,033	.....	.....
	Value	$9,178,619	$8,256,370	$7,114,478	$217,579	$113,323	$428,884	$69,164	$58,673	$254,269
New York	Pounds	.....	.....	77,254,798	2,121,096	220,878	35,923,199	845,305	.....	.....
	Value	$22,352,647	$19,427,815	$13,802,498	$799,762	$46,740	$3,338,551	$261,370	$133,383	$985,511
Pennsylvania	Pounds	.....	.....	56,905,750	2,623,152	12,000	38,087,801	4,604,809	.....	.....
	Value	$31,799,653	$27,585,169	$17,536,652	$865,378	$1,680	$3,425,680	$1,828,371	$177,832	$3,749,576
All other states	Pounds	.....	.....	37,119,386	360,759	319	18,336,346	946,187	.....	.....
	Value	$9,564,025	$9,263,848	$6,731,314	$120,987	$5,736	$1,780,825	$130,299	$85,358	$409,329

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

	United States.	California.	Massachusetts.	New Jersey.	New York.	Pennsylvania.	All other states.
Total value [1]	$139,258,296	$5,602,682	$30,327,397	$10,813,228	$30,863,238	$48,660,497	$12,931,254
Chocolate:							
In cakes—							
Sweetened	21,451,403	239,220	5,144,935	1,624,717	2,904,488	9,769,076	4,768,967
Unsweetened	8,135,032	196,199	3,576,884	161,914	3,586,666	539,419	73,950
With nuts	18,600,334	272,570	2,710,613	349,117	1,797,407	13,405,787	64,840
Coatings—							
Sweetened	23,671,321	2,603,978	6,844,797	522,246	1,358,849	7,888,139	4,453,312
Unsweetened	9,380,148	74,440	2,523,936	.....	6,602,230	156,803	22,739
Milk chocolate	9,057,568	3,640	204,513	590,750	2,816,982	4,755,800	685,883
Liquor	2,790,182	.....	283,380	216,530	281,868	1,479,865	528,539
Other	2,758,565	1,475,578	.....	.....	1,256,218	26,769	.....
Cocoa:							
Powdered, in cans	9,423,285	329,000	1,291,060	803,046	2,764,855	3,186,908	1,048,416
In other forms	14,180,705	166,464	5,221,812	2,268,427	2,726,492	3,126,552	670,958
Cocoa butter	13,897,384	108,105	1,917,799	3,698,562	4,618,769	3,329,039	225,110
Other chocolate and cocoa products, except confectionery	356,325	78,418	5,441	81,606	128,586	47,977	14,297
Candy and confectionery	607,331	1,128	354,961	53,901	.....	.....	287,341
All other	1,858,713	113,942	247,266	442,412	19,828	948,363	86,902

[1] In addition, chocolate and cocoa products to the value of $1,368,243 were reported by establishments engaged primarily in other industries.

GENERAL TABLES.

Comparative summary, by states.—Table 13 gives for 1919 and 1914 by states, the number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products for the chocolate and cocoa industry.

Detailed statistics, by states.—Table 14 presents for 1919, statistics in detail for the industry as a whole, and for each state that can be shown separately without the possibility of disclosing the operations of individual establishments.

TABLE 13.—COMPARATIVE SUMMARY, BY STATES: 1919 AND 1914.

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	48	9,083	33,440	$9,270	$101,754	$139,258
	1914	36	4,160	19,736	2,036	24,483	35,713
Massachusetts	1919	6	2,007	5,711	1,945	23,989	30,327
	1914	5	943	4,403	592	7,303	10,210
New Jersey	1919	8	489	1,946	502	9,277	10,813
	1914	6	322	1,342	148	1,579	2,162
New York	1919	14	2,311	10,335	$2,064	$22,740	$30,863
	1914	13	810	4,482	380	5,367	7,412
Pennsylvania	1919	10	3,231	11,025	3,531	32,262	48,660
	1914	7	1,756	7,607	739	7,546	12,342
All other states	1919	10	1,045	4,423	1,228	13,486	18,595
	1914	5	329	1,902	177	2,688	3,587

TABLE 14.—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	48	10,287	21	279	611	293	9,083	Oc 10,034	My 8,200	9,313	6,838	2,383	36	56	$60,674,737	$1,928,732	$2,109,724
California	4	295	.....	18	16	9	252	Ap 282	Jy 221	245	185	60	.....	.....	2,711,270	82,577	55,584
Massachusetts	6	2,223	.....	45	117	54	2,007	Se 2,144	My 1,844	1,887	1,358	502	12	15	14,871,209	346,233	413,705
New Jersey	8	569	8	25	18	29	489	Oc 535	My 435	532	379	138	11	4	2,612,298	188,020	114,559
New York	14	2,644	5	101	172	55	2,311	Oc 2,735	My 2,027	2,247	1,694	548	2	3	11,116,115	445,851	608,514
Pennsylvania	10	3,648	7	69	224	117	3,231	No 3,576	My 2,851	3,561	2,586	956	4	15	23,604,607	594,422	611,040
All other states [1]	6	908	1	21	64	29	793	.....	.....	841	636	179	7	19	5,759,238	271,629	306,322

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.[2]	Rented.[3]	Electric-horsepower generated in establishments reporting.
United States	$9,270,077	$1,463	$271,685	$5,765,825	$100,347,208	$1,407,258	$139,258,296	$37,503,830	33,440	15,273	.....	1,783	300	16,084	8,494
California	251,171	.....	8,575	285,453	3,754,700	50,615	5,662,682	1,857,367	1,353	40	.....	.....	.....	1,313	.....
Massachusetts	1,944,753	1,463	37,461	827,625	23,697,564	291,586	30,327,397	6,338,247	5,711	2,662	.....	150	300	2,599	331
New Jersey	501,630	.....	56,993	140,582	9,178,619	98,502	10,813,228	1,536,107	1,946	400	.....	133	.....	1,413	186
New York	2,053,937	.....	150,302	606,003	22,352,647	387,539	30,863,238	8,123,052	10,335	3,996	.....	.....	.....	6,339	400
Pennsylvania	3,531,375	.....	1,080	3,652,873	31,799,653	462,611	48,660,497	16,398,233	11,025	7,675	.....	1,500	.....	1,850	7,477
All other states [1]	977,211	.....	17,274	253,289	9,564,025	116,405	12,931,254	3,250,824	3,070	500	.....	.....	.....	2,570	100

[1] All other states embrace: Connecticut, 1 establishment; Illinois, 1; Ohio, 2; Vermont, 1; Wisconsin, 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).

CONFECTIONERY AND ICE CREAM.

GENERAL STATISTICS.

General character of the industry.—Statistics are here presented for the manufacture of confectionery and ice cream. Every state is represented, evidencing the universal character of the industry, although approximately half the manufacturing is carried on in New York, Illinois, Pennsylvania, and Massachusetts.

Importance and growth of the industry.—Table 15 summarizes the statistics for the censuses of 1919 and 1914 with percentages of increase. The large increases in the salaries and wages, cost of materials, and value of products are due largely to a general rise of prices and wages following the World War, and do not, therefore, fairly measure the growth of the industry for that period. A truer index of the conditions is found in the increases in the average number of wage earners and primary horsepower. The addition of Federal income tax since 1919 will account for the increase in "Rent and taxes." Contract work, or work performed by employees other than those in the plants reporting, has little significance, since it represents merely the methods of manufacture used by establishments, which vary from year to year.

Principal states, ranked by value of products.—New York, Illinois, Pennsylvania, and Massachusetts, as shown by Table 16, lead in the manufacture of confectionery and ice cream, reporting 49.1 per cent of the total number of wage earners and 50.8 per cent of the total value of products.

Persons engaged in the industry.—The classification, by sex, for 1919 was reported separately, but for 1914 was obtained in the same manner as distribution by age. The age classification of average number of wage earners in Table 17 is an estimate obtained by the method described in the "Explanation of terms." Figures by states will be found in Table 28.

Wage earners, by months.—As shown by Table 18, the number of wage earners employed in the industry month by month ranged from a maximum of 107,004 in October to a minimum of 86,491 in January, the minimum being equivalent to 80.8 per cent of the maximum. States employing over 850 wage earners are shown separately, as are also those showing a large number of females employed.

Prevailing hours of labor.—Table 19 shows 61.2 per cent of the wage earners as employed less than 54 hours per week, while the groups "60" and "Over 60" constituted 11.9 per cent of the total number.

Size of establishments, by average number of wage earners.—Analysis of Table 20 discloses the significant fact that 4,787 establishments, or 72.3 per cent of the total number for the industry employed fewer than six wage earners each, while only 7,881, or 8.2 per cent of the total number of wage earners, were employed therein. On the other hand, the classes "501 to 1,000" and "Over 1,000" wage earners, comprising 20 establishments, employed 15,456 wage earners, or 16.2 per cent of the total average number, illustrating the extent of manufacturing operations in a few large establishments.

Size of establishments, by value of products.—At the census of 1914 establishments with products valued at "$100,000 to $1,000,000" constituted one group, but at the census of 1919 this group was subdivided into "$100,000 to $500,000" and "$500,000 to $1,000,000." Separate figures for the number of establishments, and value of products have been compiled, however, from the returns for 1914. Table 21, therefore, gives combined figures for these two groups in case of average number of wage earners and value added by manufacture for 1914. The statistics in this table show the degree of concentration of production in large establishments. In 1919 the groups "$500,000 to $1,000,000" and "$1,000,000 and over" included 260 establishments, or 3.9 per cent of the total number for the industry, employed 53,078 wage earners, or 55.4 per cent of the total average number, and reported products to the value of $357,432,334, or 56.0 per cent of the total value of products.

Character of ownership.—Table 22 shows that in 1919 corporations owned only 23.5 per cent of the establishments engaged in the confectionery and ice cream industry while employing 76.2 per cent of the total average number of wage earners and reporting 75.6 per cent of the total value of products. During the five-year period 1914–1919 the average number of wage earners in corporations increased 29,153, or 66.7 per cent, and the value of products $336,643,674, or 231.8 per cent.

Number and horse power of types of prime movers.—From 1914 to 1919, as shown by Table 23, there was an increase in the total horsepower for the industry of 81,598 horsepower, or 82.9 per cent, due primarily to an increase of 72,836 horsepower, or 171.6 per cent in rented power, during this five-year period.

Fuel consumed.—Table 24 shows the kinds of fuel used for the industry. Gas was the principal fuel used in 1919 as well as in 1914. Large quantities of bituminous coal were also consumed.

TABLE 15.—COMPARATIVE SUMMARY: 1919 AND 1914.

	1919	1914	Per cent of increase, 1914–1919.		1919	1914	Per cent of increase, 1914–1919.
Number of establishments	6,624	4,754	39.3	Salaries and wages	$115,955,895	$41,600,871	178.7
				Salaries	39,796,029	14,112,623	182.0
Persons engaged	122,028	78,676	55.1	Wages	76,159,866	27,488,248	177.1
Proprietors and firm members	7,051	4,933	42.9				
Salaried employees	19,329	11,757	64.4	Paid for contract work	1,191,586	124,225	859.2
Wage earners (average number)	95,648	61,986	54.3	Rent and taxes	33,750,537	4,712,786	616.1
				Cost of materials	368,809,170	126,464,242	191.6
Primary horsepower	179,991	98,393	82.9	Value of products	637,209,168	209,668,656	203.9
Capital	$317,043,923	$120,544,963	163.0	Value added by manufacture [1]	268,399,998	83,204,414	222.6

[1] Value of products less cost of materials.

TABLE 16.—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	6,624	95,648	100.0	....	$637,209	100.0	....	$268,400	100.0	....
New York	930	15,615	16.3	1	110,069	17.3	1	47,644	17.8	1
Illinois	462	8,779	9.2	4	73,097	11.5	2	32,001	11.9	2
Pennsylvania	839	11,010	11.5	3	71,120	11.2	3	28,590	10.7	3
Massachusetts	278	11,585	12.1	2	68,897	10.8	4	28,543	10.6	4
Ohio	380	5,451	5.7	5	39,185	6.1	5	17,363	6.5	5
Wisconsin	150	4,123	4.3	6	24,389	3.8	6	9,969	3.7	7
Missouri	220	3,669	3.8	8	23,497	3.7	7	10,570	3.9	6
California	298	4,083	4.3	7	23,226	3.6	8	9,732	3.6	8
Maryland	170	3,008	3.1	9	17,995	2.8	9	6,659	2.5	10
New Jersey	245	2,955	3.1	10	16,899	2.7	10	6,722	2.5	9
Texas	193	1,950	2.0	12	13,309	2.1	11	5,081	1.9	12
Michigan	184	1,746	1.8	13	12,626	2.0	12	5,458	2.0	11
Iowa	182	1,739	1.8	14	11,535	1.8	13	4,664	1.7	13
Indiana	235	1,713	1.8	15	11,195	1.8	14	3,982	1.5	18
Washington	119	1,596	1.7	16	10,302	1.6	15	4,618	1.7	14
Minnesota	117	1,959	2.0	11	10,056	1.6	16	4,368	1.6	16
Tennessee	68	1,397	1.5	18	10,017	1.6	17	4,036	1.5	17
Georgia	60	1,553	1.6	17	9,680	1.5	18	4,427	1.6	15
Virginia	76	855	0.9	20	$6,692	1.1	19	$2,681	1.0	21
Utah	49	1,123	1.2	19	6,238	1.0	20	2,930	1.1	20
Connecticut	121	849	0.9	21	5,260	0.8	21	2,203	0.8	24
Kentucky	87	797	0.8	23	5,255	0.8	22	2,340	0.9	22
Louisiana	41	818	0.9	22	5,096	0.8	23	2,020	0.8	25
Colorado	91	783	0.8	24	5,004	0.8	24	2,307	0.9	23
Dist. of Columbia	23	617	0.7	25	4,859	0.8	25	3,002	1.1	19
Kansas	115	584	0.6	27	3,886	0.6	26	1,493	0.6	26
Nebraska	53	607	0.6	26	3,666	0.6	27	1,415	0.5	28
Oklahoma	73	381	0.4	31	3,591	0.6	28	1,299	0.5	30
Oregon	37	450	0.5	29	3,466	0.5	29	1,246	0.5	31
Alabama	39	486	0.5	28	3,249	0.5	30	1,489	0.6	27
West Virginia	75	342	0.4	32	3,178	0.5	31	1,318	0.5	29
Arkansas	64	391	0.4	30	2,593	0.4	32	1,028	0.4	32
Rhode Island	87	292	0.3	35	2,368	0.4	33	908	0.3	33
North Carolina	66	316	0.3	33	2,035	0.3	34	889	0.3	34
Maine	87	313	0.3	34	2,032	0.3	35	767	0.3	35
All other states	310	1,713	1.8	....	11,647	1.8	....	4,629	1.7	...

TABLE 17.—PERSONS ENGAGED IN THE INDUSTRY: 1919 AND 1914.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.		CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL.	
					Male.	Female.						Male.	Female.
All classes	1919	122,028	64,299	57,729	52.7	47.3	Clerks and other subordinate salaried employees.	1919	13,914	7,906	6,008	56.8	43.2
	1914	78,676	41,877	36,799	53.2	46.8		1914	9,019	6,313	2,706	70.0	30.0
Proprietors and officials	1919	12,466	11,661	805	93.5	6.5	Wage earners (average number)	1919	95,648	44,732	50,916	46.8	53.2
	1914	7,671	7,268	403	94.7	5.3		1914	61,986	28,296	33,690	45.6	54.4
Proprietors and firm members	1919	7,051	6,695	356	95.0	5.0	16 years of age and over	1919	92,318	43,763	48,555	47.4	52.6
	1914	4,933	4,682	251	94.9	5.1		1914	59,725	27,840	31,885	46.6	53.4
Salaried officers of corporations	1919	2,250	2,127	123	94.5	5.5	Under 16 years of age	1919	3,330	969	2,361	29.1	70.9
	1914	1,242	1,176	66	94.7	5.3		1914	2,261	456	1,805	20.2	79.8
Superintendents and managers	1919	3,165	2,839	326	89.7	10.3							
	1914	1,496	1,410	86	94.3	5.7							

TABLE 18.—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.]

STATES.	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	95,648	*86,491*	89,978	91,061	90,859	86,453	90,449	91,900	99,382	104,608	**107,004**	105,212	101,379	80.8
Males	44,732	*38,564*	40,015	40,619	42,041	43,324	46,041	47,275	49,471	**50,172**	48,350	46,416	44,496	76.9
Females	50,916	47,927	49,963	50,442	48,818	46,129	*44,408*	44,625	49,911	54,436	58,654	**58,796**	56,883	75.5
1914	61,986	*57,094*	57,203	59,309	58,714	58,950	59,305	59,299	63,011	68,004	**69,495**	66,962	66,486	82.2
California	4,083	*3,497*	3,561	3,709	3,810	3,744	3,881	3,903	4,210	4,459	4,671	**4,829**	4,722	72.4
Georgia	1,553	1,381	1,378	1,365	1,379	*1,355*	1,403	1,539	1,558	1,782	**1,850**	1,847	1,799	73.2
Illinois	8,779	7,738	8,333	8,258	7,951	7,705	7,821	*7,407*	9,387	10,214	**10,690**	10,479	9,365	69.3
Indiana	1,713	1,608	1,639	*1,523*	1,587	1,566	1,711	1,769	1,892	**1,898**	1,871	1,806	1,686	80.2
Iowa	1,739	1,557	**1,594**	*1,539*	1,620	1,666	1,753	1,690	1,818	1,935	1,879	**1,996**	1,821	77.1
Maryland	3,008	2,656	2,748	2,877	2,888	2,896	2,565	*2,558*	2,668	3,339	3,404	**3,770**	3,727	67.9
Massachusetts	11,585	*10,708*	11,506	11,783	11,456	11,132	10,826	10,733	11,982	12,103	**12,593**	12,428	11,770	85.0
Michigan	1,746	1,617	1,626	1,539	1,526	*1,519*	1,609	1,708	1,768	1,872	2,052	**2,096**	2,020	72.5
Minnesota	1,959	1,722	1,895	1,809	1,660	1,660	*1,594*	1,696	2,083	2,126	2,357	2,429	**2,507**	63.6
Missouri	3,669	*3,308*	3,428	3,432	3,402	3,414	3,412	3,471	3,711	3,966	4,138	**4,215**	4,071	79.9
New Jersey	2,955	*2,317*	2,450	2,540	2,582	2,584	2,865	3,273	3,722	3,846	**3,924**	2,763	2,594	59.0
New York	15,615	14,923	15,333	15,721	15,772	14,796	*14,398*	14,850	15,622	16,340	**16,730**	16,451	16,444	86.1
Ohio	5,451	4,931	4,913	4,753	*4,588*	4,698	5,023	5,046	5,819	6,361	**6,689**	6,584	6,007	68.6
Pennsylvania	11,010	*10,018*	10,514	10,809	11,094	10,859	10,958	11,221	11,407	**11,804**	11,426	11,014	10,996	84.9
Tennessee	1,397	1,257	1,318	*1,256*	1,313	1,334	1,321	1,322	1,442	1,624	**1,629**	1,535	1,413	77.1
Texas	1,950	*1,746*	1,766	1,880	1,924	1,929	1,984	1,955	2,068	**2,162**	2,078	2,033	1,875	80.8
Utah	1,123	*1,005*	1,052	1,054	1,078	1,102	1,140	1,057	1,018	1,107	1,227	**1,326**	1,310	75.8
Virginia	855	*762*	775	817	840	877	905	901	923	**936**	880	785	859	81.4
Washington	1,596	1,441	*1,422*	1,501	1,448	1,448	1,550	1,516	1,542	1,630	1,873	1,888	**1,893**	75.1
Wisconsin	4,123	*3,708*	3,974	3,984	3,876	3,750	3,800	3,909	4,164	4,312	4,612	**4,714**	4,673	78.7
States showing large proportion of females.														Per ct. av. is of state.
California	2,339	*2,002*	2,057	2,134	2,152	2,061	2,058	2,038	2,298	2,559	2,812	**2,962**	2,935	57.3
Colorado	462	*351*	369	379	354	376	391	412	472	611	**616**	611	602	59.0
Georgia	885	830	806	808	768	737	768	832	845	983	1,066	1,088	**1,089**	57.0
Illinois	4,277	3,850	4,232	4,148	3,892	3,638	3,520	*3,342*	4,346	4,889	**5,361**	5,314	4,792	48.7
Iowa	954	913	929	869	879	881	879	*781*	898	1,061	1,069	**1,213**	1,076	54.9
Louisiana	505	509	556	564	528	455	415	*399*	431	518	563	**579**	543	61.7
Maryland	1,763	1,509	1,630	1,709	1,671	1,634	1,326	*1,312*	1,432	1,916	2,057	**2,454**	2,446	58.6
Massachusetts	7,786	7,404	7,957	8,171	7,844	7,463	7,126	*6,965*	7,871	7,918	**8,420**	8,328	7,965	67.2
Michigan	911	925	909	829	798	781	*743*	750	807	888	1,116	**1,208**	1,178	52.2
Minnesota	1,290	1,183	1,266	1,229	1,089	1,096	*993*	1,049	1,342	1,351	1,549	1,633	**1,700**	65.8
Missouri	1,902	1,794	1,820	1,818	1,741	1,705	1,664	*1,660*	1,828	1,954	2,205	**2,365**	2,270	51.8
New Jersey	1,546	*1,188*	1,265	1,325	1,309	1,251	1,382	1,644	1,950	2,129	**2,293**	1,482	1,334	52.3
New York	8,159	8,250	8,358	8,666	8,487	7,135	*6,719*	7,093	7,725	8,272	8,997	8,899	**9,007**	52.3
Ohio	2,895	2,753	2,712	2,565	2,296	2,297	*2,261*	*2,261*	2,875	3,505	**3,900**	3,817	3,468	53.1
Utah	686	618	643	645	653	661	677	603	*583*	662	776	**868**	843	61.1
Washington	1,062	967	955	1,022	951	*923*	993	970	975	1,051	1,283	1,319	**1,335**	66.5
Wisconsin	2,659	2,455	2,651	2,633	2,546	2,426	*2,383*	2,428	2,609	2,733	2,977	**3,041**	3,026	64.5

TABLE 19.—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	95,648	10,382	5,658	27,052	15,484	14,351	11,258	5,623	5,840
California	4,083	127	94	2,928	462	149	153	85	85
Colorado	783	16	.....	600	4	91	33	25	14
District of Columbia	617	.....	.....	239	5	3	47	.....	323
Georgia	1,553	7	.....	40	1,041	113	220	22	110
Illinois	8,779	5,992	78	714	387	473	412	356	367
Indiana	1,713	17	3	113	269	258	514	188	351
Iowa	1,739	6	1	201	347	274	252	552	106
Kentucky	797	8	.....	30	178	102	28	350	101
Louisiana	818	34	8	91	7	28	129	426	95
Maryland	3,008	69	10	92	1,154	411	776	247	249
Massachusetts	11,585	271	2,941	7,211	692	406	18	23	23
Michigan	1,746	56	9	395	267	590	34	119	276
Minnesota	1,959	108	45	672	656	273	65	119	21
Missouri	3,669	64	245	198	840	1,638	484	60	140
New Jersey	2,955	341	24	1,498	400	180	190	112	210
New York	15,615	1,574	1,229	5,851	3,586	2,014	840	320	201
Ohio	5,451	122	284	1,044	1,713	728	845	488	227
Pennsylvania	11,010	320	167	915	1,600	4,119	2,382	563	944
Tennessee	1,397	8	.....	191	156	29	564	332	117
Texas	1,950	5	.....	183	144	830	22	218	548
Utah	1,123	390	262	197	217	6	.....	.....	51
Virginia	855	36	3	115	165	203	76	132	125
Washington	1,596	415	84	1,014	22	5	34	17	5
Wisconsin	4,123	26	73	1,026	232	226	2,262	137	141

TABLE 20.—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 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	6,624	95,648	1,037	3,750	7,881	1,043	11,088	410	13,207	192	13,752	135	21,649	37	12,615	17	11,635	3	3,821
California	298	4,083	34	157	347	63	735	29	953	8	580	6	926	.....	.....	1	542	.....	.....
Colorado	91	783	13	56	112	12	128	6	162	2	130	2	251	.....	.....	.....	.....	.....	.....
District of Columbia	23	617	1	12	35	6	52	2	82	.....	.....	1	132	1	316	.....	.....	.....	.....
Georgia	60	1,553	5	31	71	12	129	6	187	2	143	2	364	2	659	.....	.....	.....	.....
Illinois	462	8,779	76	230	472	81	900	42	1,379	17	1,271	12	2,009	1	351	2	1,310	1	1,087
Indiana	235	1,713	37	152	324	27	269	11	337	5	357	3	426	.....	.....	.....	.....	.....	.....
Iowa	182	1,739	23	120	234	22	242	7	239	9	680	.....	.....	1	344	.....	.....	.....	.....
Kentucky	87	797	16	56	135	10	98	2	72	1	63	1	172	1	257	.....	.....	.....	.....
Louisiana	41	818	1	22	72	13	134	2	95	.....	.....	3	517	.....	.....	.....	.....	.....	.....
Maryland	170	3,008	32	93	167	25	266	8	297	4	297	6	907	1	456	1	618	.....	.....
Massachusetts	278	11,585	16	143	315	61	656	23	819	11	696	13	2,184	6	2,151	3	2,030	2	2,734
Michigan	184	1,746	34	107	247	27	292	9	286	3	225	3	415	1	281	.....	.....	.....	.....
Minnesota	117	1,959	18	53	118	27	347	9	255	6	396	3	449	1	394	.....	.....	.....	.....
Missouri	220	3,669	41	126	262	25	227	11	317	4	270	11	1,808	1	260	1	525	.....	.....
New Jersey	245	2,955	35	154	318	34	340	10	296	9	632	1	249	1	355	1	765	.....	.....
New York	930	15,615	172	531	1,031	108	1,136	50	1,572	36	2,579	20	3,218	8	2,590	5	3,489	.....	.....
Ohio	380	5,451	65	191	390	61	643	33	1,073	15	1,147	14	1,869	1	329	.....	.....	.....	.....
Pennsylvania	839	11,010	187	447	956	120	1,292	46	1,553	15	1,084	16	2,600	6	2,016	2	1,419	.....	.....
Tennessee	68	1,397	9	23	39	19	187	11	294	2	150	3	446	1	281	.....	.....	.....	.....
Texas	193	1,950	18	121	281	33	374	11	367	7	487	3	441	.....	.....	.....	.....	.....	.....
Utah	49	1,123	10	21	46	9	97	5	168	1	73	2	376	1	363	.....	.....	.....	.....
Virginia	76	855	4	44	83	15	153	8	228	5	391	.....	.....	.....	.....	.....	.....	.....	.....
Washington	119	1,596	13	58	151	32	308	11	302	3	228	1	197	1	410	.....	.....	.....	.....
Wisconsin	150	4,123	14	76	138	31	335	13	423	8	553	5	935	2	802	1	937	.....	.....

TABLE 21.—SIZE OF ESTABLISHMENTS, BY VALUE OF PRODUCTS: 1919, 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	6,624	4,754	95,648	61,986	$637,209,168	$209,668,656	$268,399,998	$83,204,414
Less than $5,000	1,371	1,483	590	1,184	3,508,077	3,872,560	1,616,510	1,961,681
$5,000 to $20,000	2,322	1,859	4,113	5,439	25,275,653	19,062,161	10,854,891	8,865,516
$20,000 to $100,000	1,907	981	12,430	11,331	82,883,571	41,440,149	32,508,775	16,985,945
$100,000 to $500,000	764	369	25,437	33,918	168,109,573	81,622,684	66,802,764	42,139,944
$500,000 to $1,000,000	136	43	14,615		94,450,874	30,268,272	39,478,971	
$1,000,000 and over	124	19	38,463	10,094	262,981,460	33,402,830	117,138,087	13,251,328
	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	20.7	31.2	0.6	1.9	0.6	1.8	0.6	2.4
$5,000 to $20,000	35.1	39.1	4.3	8.8	4.0	9.1	4.0	10.7
$20,000 to $100,000	28.8	20.6	13.0	18.3	13.0	19.8	12.1	20.4
$100,000 to $500,000	11.5	7.8	26.6	54.8	26.4	38.9	24.9	50.6
$500,000 to $1,000,000	2.1	0.9	15.3		14.8	14.4	14.7	
$1,000,000 and over	1.9	0.4	40.2	16.3	41.3	15.9	43.6	15.9

TABLE 22.—CHARACTER OF OWNERSHIP, BY SELECTED 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	3,486	1,555	1,583	95,648	12,680	72,865	10,103	13.3	76.2	10.6	$637,209,168	$85,955,945	$481,845,322	$69,407,901	13.5	75.6	10.9
	1914	2,667	1,060	1,027	61,986	11,429	43,712	6,845	18.4	70.5	11.0	209,668,656	39,564,073	145,201,648	24,902,935	18.9	69.3	11.9
California	1919	178	57	63	4,083	1,103	2,064	916	27.0	50.6	22.4	23,225,675	5,939,970	12,217,625	5,068,080	25.6	52.6	21.8
	1914	102	35	45	2,098	449	872	777	21.4	41.6	37.0	7,619,431	1,463,439	3,613,075	2,542,917	19.2	47.4	33.4
Georgia	1919	28	23	9	1,553	186	1,274	93	12.0	82.0	6.0	9,680,022	1,085,281	7,998,264	596,477	11.2	82.6	6.2
	1914	19	15	8	720	187	517	22	25.8	71.2	3.0	2,455,233	483,747	1,888,806	82,680	19.7	76.9	3.4
Illinois	1919	219	144	99	8,779	856	7,487	436	9.8	85.3	5.0	73,096,890	6,649,262	62,749,904	3,697,724	9.1	85.8	5.1
	1914	150	100	75	5,399	757	4,145	497	14.0	76.8	9.2	20,088,220	2,932,925	14,844,690	2,310,605	14.6	73.9	11.5
Indiana	1919	132	45	58	1,713	449	1,047	217	26.2	61.1	12.7	11,194,689	2,998,988	6,509,427	1,686,274	26.8	58.1	15.1
	1914	103	32	55	1,263	298	837	128	23.6	66.3	10.1	4,603,575	1,187,648	2,877,499	538,428	25.8	62.5	11.7
Iowa	1919	90	41	51	1,739	168	1,347	224	9.7	77.5	12.9	11,534,628	1,461,669	8,535,335	1,537,624	12.7	74.0	13.3
	1914	99	36	41	1,519	229	1,218	72	15.1	80.2	4.7	5,086,438	949,039	3,741,746	395,653	18.7	73.6	7.8
Maryland	1919	105	29	36	3,008	509	2,283	216	16.9	75.9	7.2	17,995,081	3,177,877	13,809,025	1,008,179	17.7	76.7	5.6
	1914	73	22	30	1,672	324	1,172	176	19.4	70.1	10.5	4,721,213	973,727	3,232,528	514,958	20.6	68.5	10.9
Massachusetts	1919	125	90	63	11,585	673	10,291	621	5.8	88.8	5.4	68,896,885	4,755,639	58,839,091	5,302,155	6.9	85.4	7.7
	1914	155	60	58	7,250	690	6,239	321	9.5	86.1	4.4	22,901,916	2,597,221	19,032,595	1,272,100	11.3	83.1	5.6
Michigan	1919	90	30	64	1,746	344	905	497	19.7	51.8	28.5	12,626,501	2,493,155	7,264,649	2,868,697	19.7	57.5	22.7
	1914	73	20	29	1,173	341	647	185	29.1	55.2	15.8	4,815,201	1,272,964	2,745,417	796,820	26.4	57.0	16.5
Minnesota	1919	36	38	43	1,959	179	1,598	182	9.1	81.6	9.3	10,055,805	1,245,623	7,805,017	1,005,165	12.4	77.6	10.0
	1914	41	28	33	978	158	668	152	16.2	68.3	15.5	3,876,914	643,027	2,582,830	651,057	16.6	66.6	16.8
Missouri	1919	103	50	67	3,669	550	2,975	144	15.0	81.1	3.9	23,497,553	3,000,292	19,422,459	1,074,802	12.8	82.7	4.6
	1914	69	41	43	2,782	225	2,396	161	8.1	86.1	5.8	8,649,577	808,932	7,151,561	689,084	9.4	82.7	8.0
New Jersey	1919	155	48	42	2,955	454	2,302	199	15.4	77.9	6.7	16,898,953	3,103,543	11,923,416	1,871,994	18.4	70.6	11.1
	1914	87	29	25	1,810	268	1,287	255	14.8	71.1	14.1	6,079,244	881,773	4,116,577	1,080,894	14.5	67.7	17.8
New York	1919	529	193	208	15,615	1,688	11,654	2,273	10.8	74.6	14.6	110,068,958	12,654,339	80,426,791	16,987,828	11.5	73.1	15.4
	1914	286	134	103	11,667	3,046	7,070	1,551	26.1	60.6	13.3	37,934,704	10,045,729	22,584,204	5,304,771	26.5	59.5	14.0
Ohio	1919	148	118	114	5,451	351	4,495	605	6.4	82.5	11.1	39,185,084	2,657,140	32,117,440	4,410,504	6.8	82.0	11.3
	1914	131	83	68	3,757	412	2,834	511	11.0	75.4	13.6	13,197,372	1,244,858	10,488,831	1,463,683	9.4	79.5	11.1
Pennsylvania	1919	500	114	165	11,010	2,583	7,348	1,079	23.5	66.7	9.8	71,120,044	16,718,710	48,044,152	6,357,182	23.5	67.6	8.9
	1914	467	76	109	8,038	2,181	5,127	730	27.1	63.8	9.1	24,087,510	7,163,972	14,640,904	2,282,634	29.7	60.8	9.5
Tennessee	1919	20	34	14	1,397	46	1,200	151	3.3	85.9	10.8	10,017,191	327,649	8,446,179	1,243,363	3.3	84.3	12.4
	1914	21	25	9	888	69	758	61	7.8	85.4	6.9	3,644,635	186,565	3,208,859	249,211	5.1	88.0	6.8
Texas	1919	102	34	57	1,950	324	1,242	384	16.6	63.7	19.7	13,309,435	2,383,043	8,526,220	2,400,172	17.9	64.1	18.0
	1914	60	33	30	968	119	688	161	12.3	71.1	16.6	3,526,382	362,456	2,527,123	636,803	10.3	71.7	18.1
Utah	1919	18	15	16	1,123	51	1,030	42	4.5	91.7	3.7	6,238,375	333,369	5,549,781	355,225	5.3	89.0	5.7
	1914	30	18	11	762	52	694	16	6.8	91.1	2.1	2,615,172	173,833	2,358,537	82,802	6.6	90.2	3.2
Virginia	1919	37	31	8	855	122	720	13	14.3	84.2	1.5	6,691,649	726,648	5,839,962	125,039	10.9	87.3	1.9
	1914	31	22	12	578	87	455	36	15.1	78.7	6.2	2,474,954	378,316	1,924,789	171,849	15.3	77.8	6.9
Washington	1919	48	50	21	1,596	146	1,315	135	9.1	82.4	8.5	10,301,924	1,038,317	8,415,579	848,028	10.1	81.7	8.2
	1914	48	32	20	638	119	446	73	18.7	69.9	11.4	2,474,506	423,370	1,749,775	301,361	17.1	70.7	12.2
Wisconsin	1919	66	59	25	4,123	149	3,893	81	3.6	94.4	2.0	24,388,617	1,158,992	22,558,176	671,449	4.8	92.5	2.8
	1914	51	34	15	2,420	138	2,253	38	5.6	92.8	1.6	7,243,167	430,302	6,655,145	157,720	5.9	91.9	2.2

TABLE 23.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919 AND 1914.

POWER.	Number of engines or motors.		Horsepower.			
			Amount.		Per cent distribution.	
	1919	1914	1919	1914	1919	1914
Primary power, total	21,094	9,274	179,991	98,393	100.0	100.0
Owned	1,307	1,414	64,713	55,951	36.0	56.9
Steam	745	764	52,763	45,107	29.3	45.8
Engines	723	764	51,250	45,107	28.5	45.8
Turbines	22	.....	1,513	.....	0.8	.....
Internal-combustion engines	543	630	11,800	10,781	6.6	11.0
Water wheels, turbines, and motors	19	20	150	63	0.1	0.1
Primary power—Continued.						
Rented	19,787	7,860	115,278	42,442	64.0	43.1
Electric	19,787	7,860	115,069	41,836	63.9	42.5
Other	.....	.....	209	606	0.1	0.6
Electric	23,429	10,935	138,344	62,540	100.0	100.0
Rented	19,787	7,860	115,069	41,836	83.2	66.9
Generated by establishments reporting	3,642	3,075	23,275	20,704	16.8	33.1

TABLE 24.—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..	126,566	458,614	9,998	75,258	16,295	1,853,503
1914..	109,148	307,309	16,162	31,775	(1)	1,453,393
California	3	152	6	20,012	590	100,743
Georgia	563	4,412	406	.....	.....	11,095
Illinois	556	58,020	586	135	833	96,646
Indiana	400	21,964	297	4	803	20,745
Iowa	387	17,148	246	4,676	160	11,510
Maryland	2,723	9,830	136	212	714	134,997
Massachusetts	5,943	29,292	400	19	191	67,051
Michigan	473	9,123	370	6	141	49,730
Minnesota	1,527	5,214	735	.....	528	15,293
Missouri	105	30,409	640	1,155	448	26,046
New Jersey	6,399	19,236	263	571	579	21,074
New York	72,696	28,915	886	195	1,248	189,128
Ohio	517	34,362	392	64	1,396	226,468
Pennsylvania	26,827	80,515	303	691	5,008	246,281
Tennessee	.....	13,355	1,305	60	23	9,041
Texas	72	6,537	173	21,305	880	87,143
Utah	.....	2,642	194	.....	70	3,899
Virginia	99	6,178	370	.....	74	4,529
Washington	6	1,418	171	1,510	9	25,159
Wisconsin	918	16,940	341	4	179	12,336

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Detailed statistics of materials.—Table 25 gives the cost and, with the exceptions of "milk and milk products" and "flavors," the quantity of the principal materials used in the manufacture of confectionery and ice cream.

Detailed statistics of products.—Table 26 gives the specific value of confectionery and ice cream manufactured in each state and shows that confectionery is 67 per cent of the total value of products while ice cream is 28 per cent.

TABLE 25.—QUANTITY AND COST OF MATERIALS: 1919.

MATERIAL.	Pounds.	Cost.
Total cost		$368,809,170
Sugar	823,865,409	83,898,562
Milk and milk products		71,473,454
Chocolate:		
Coatings	93,872,539	26,091,278
Liquors	14,735,756	4,072,549
Corn sirup	349,614,120	20,106,543
Cocoa:		
Beans	57,277,915	$10,244,203
Butter	14,542,327	5,421,093
Powder	3,202,874	715,240
Flavors		6,163,066
Nuts	90,865,274	21,139,617
Fruits	17,553,427	5,190,152
All other materials including mill supplies, containers, fuel, and rent of power		114,293,413

TABLE 26.—PRODUCTS, BY GEOGRAPHIC DIVISIONS AND STATES: 1919.

DIVISION AND STATE.	AGGREGATE.		CONFECTIONERY.			ICE CREAM.			All other products.
	Number of establishments.	Value of products.[1]	Total value.	Reported by establishments classified as—		Total value.	Reported by establishments classified as—		
				Confectionery.	Ice cream.		Confectionery.	Ice cream.	
UNITED STATES	6,624	$637,209,168	$427,544,927	$421,933,100	$5,611,827	$178,893,847	$6,752,654	$172,141,193	$30,770,394
NEW ENGLAND	620	80,725,124	63,810,862	63,248,566	562,296	15,107,505	577,887	14,529,618	1,806,757
Maine	87	2,032,509	902,377	855,688	46,689	1,056,345	71,234	985,111	73,787
New Hampshire	22	410,799	64,114	50,010	14,104	342,835	8,546	334,289	3,850
Vermont	25	1,756,560	1,129,763	1,107,507	22,256	499,512	22,348	477,164	127,285
Massachusetts	278	68,896,885	59,347,249	59,017,240	330,009	8,212,404	214,359	7,998,045	1,337,232
Rhode Island	87	2,368,490	555,944	535,769	20,175	1,749,385	111,086	1,638,299	63,161
Connecticut	121	5,259,881	1,811,415	1,682,352	129,063	3,247,024	150,314	3,096,710	201,442
MIDDLE ATLANTIC	2,014	198,087,955	130,482,177	128,417,698	2,064,479	59,493,415	1,534,164	57,959,251	8,112,363
New York	930	110,068,958	81,023,903	79,768,977	1,254,926	23,838,392	754,256	23,084,136	5,206,663
New Jersey	245	16,898,953	9,677,506	9,240,352	437,154	6,968,275	213,730	6,754,545	253,172
Pennsylvania	839	71,120,044	39,780,768	39,408,369	372,399	28,686,748	566,178	28,120,570	2,652,528
EAST NORTH CENTRAL	1,411	160,491,781	111,241,541	110,374,437	867,104	41,189,484	1,540,137	39,649,347	8,060,756
Ohio	380	39,185,084	24,090,406	23,893,237	197,169	13,366,185	485,622	12,880,563	1,728,493
Indiana	235	11,194,689	5,533,387	5,299,651	233,736	5,078,716	197,610	4,881,106	582,586
Illinois	462	73,096,890	56,990,486	56,711,744	278,742	13,894,541	340,993	13,553,548	2,211,863
Michigan	184	12,626,501	6,592,034	6,498,302	93,732	4,665,786	444,029	4,221,757	1,368,681
Wisconsin	150	24,388,617	18,035,228	17,971,503	63,725	4,184,256	71,883	4,112,373	2,169,133
WEST NORTH CENTRAL	726	55,005,029	36,173,620	35,728,296	445,324	15,673,599	997,974	14,675,625	3,157,810
Minnesota	117	10,055,805	7,516,966	7,483,629	33,337	2,401,960	78,258	2,323,702	136,879
Iowa	182	11,534,628	7,438,723	7,317,619	121,104	3,743,323	119,397	3,623,926	352,582
Missouri	220	23,497,553	16,181,742	16,070,953	110,789	5,633,242	446,405	5,186,837	1,682,569
North Dakota	20	757,057	466,337	394,662	71,675	217,634	.....	217,634	73,086
South Dakota	19	1,607,901	1,093,747	1,074,621	19,126	475,777	208,432	267,345	38,377
Nebraska	53	3,665,749	2,042,717	2,010,143	32,574	1,458,881	44,521	1,414,360	164,151
Kansas	115	3,886,336	1,433,388	1,376,669	56,719	1,742,782	100,961	1,641,821	710,166
SOUTH ATLANTIC	563	47,653,325	25,900,291	25,737,476	162,815	19,031,429	305,500	18,725,929	2,721,605
Delaware	24	666,480	214,074	207,047	7,027	409,103	35,579	373,524	43,303
Maryland	170	17,995,081	13,686,103	13,679,460	6,643	4,056,453	83,184	3,973,269	252,525
District of Columbia	23	4,859,098	697,134	693,334	3,800	3,966,584	57,545	3,909,039	195,380
Virginia	76	6,691,649	3,084,226	3,068,176	16,050	3,215,038	750	3,214,288	392,385
West Virginia	75	3,177,938	505,971	452,723	53,248	2,333,409	50,841	2,282,568	338,558
North Carolina	66	2,035,317	649,109	624,787	24,322	1,217,574	9,801	1,207,773	168,634
South Carolina	42	1,436,080	341,741	320,769	20,972	1,016,363	13,800	1,002,563	77,976
Georgia	60	9,680,022	6,526,083	6,502,683	23,400	1,927,307	54,000	1,873,307	1,226,632
Florida	27	1,111,660	195,850	188,497	7,353	889,598	.....	889,598	26,212
EAST SOUTH CENTRAL	215	19,732,653	13,131,896	13,042,901	88,995	5,364,965	176,301	5,188,664	1,235,792
Kentucky	87	5,255,290	3,503,007	3,465,786	37,221	1,321,678	27,975	1,293,703	430,605
Tennessee	68	10,017,191	7,258,122	7,206,548	51,574	2,156,072	146,526	2,009,546	602,997
Alabama	39	3,249,105	1,949,417	1,949,217	200	1,207,672	1,800	1,205,872	92,016
Mississippi	21	1,211,067	421,350	421,350	.....	679,543	.....	679,543	110,174
WEST SOUTH CENTRAL	371	24,580,615	12,780,060	12,353,239	426,821	9,996,569	323,021	9,673,548	1,812,986
Arkansas	64	2,592,993	954,216	893,174	61,042	1,356,145	23,532	1,332,613	282,632
Louisiana	41	5,096,473	3,176,365	3,091,555	84,810	1,737,450	107,918	1,629,532	182,658
Oklahoma	73	3,590,714	1,028,007	1,020,503	7,504	1,957,250	7,445	1,949,805	605,457
Texas	193	13,309,435	7,621,472	7,348,007	273,465	4,945,724	184,126	4,761,598	742,239
MOUNTAIN	250	13,930,278	10,205,365	9,737,909	467,456	3,412,367	381,621	3,030,746	312,546
Montana	37	809,950	446,364	367,803	78,561	352,962	23,240	329,722	10,624
Idaho	20	788,317	577,865	557,575	20,290	175,851	35,936	139,915	34,601
Wyoming	18	222,624	52,269	36,591	15,678	139,111	15,040	124,071	31,244
Colorado	91	5,003,980	3,610,386	3,467,497	142,889	1,230,350	183,753	1,046,597	163,253
New Mexico	12	198,767	26,938	.....	26,938	153,938	.....	153,938	17,891
Arizona	19	514,546	151,579	102,821	48,758	353,073	12,864	340,209	9,894
Utah	49	6,238,375	5,304,864	5,185,522	119,342	888,472	108,548	779,924	45,039
Nevada	4	153,710	35,100	20,100	15,000	118,610	2,240	116,370	.....
PACIFIC	454	36,993,408	23,819,115	23,292,578	526,537	9,624,514	916,049	8,708,465	3,549,779
Washington	119	10,301,924	7,387,030	7,336,707	50,323	1,878,732	136,844	1,741,888	1,036,162
Oregon	37	3,465,809	2,085,254	2,076,678	8,576	1,204,776	48,952	1,155,824	175,779
California	298	23,225,675	14,346,831	13,879,193	467,638	6,541,006	730,253	5,810,753	2,337,838

[1] In addition, confectionery and ice cream to the value of $14,001,298 and $6,237,400, respectively, were reported by establishments engaged primarily in other industries.

GENERAL TABLES.

Comparative summary of the industry, by states.—Table 27 gives for 1919 and 1914, by states, the number of establishments, average number of wage earners, primary horsepower, wages, cost of materials, and value of products for the confectionery and ice cream industry.

Detailed statistics, by states.—Table 28 presents for 1919 statistics in detail for the industry as a whole, and for each state separately.

TABLE 27.—COMPARATIVE SUMMARY BY STATES: 1919 AND 1914.

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	6,624	95,648	179,991	$76,160	$368,809	$637,209
	1914	4,754	61,986	98,393	27,488	126,464	209,669
Alabama	1919	39	486	814	325	1,760	3,249
	1914	33	281	527	106	699	1,027
Arkansas	1919	64	391	1,248	298	1,565	2,503
	1914	43	178	418	89	560	878
California	1919	298	4,083	5,766	3,258	13,493	23,226
	1914	182	2,098	2,202	1,111	4,341	7,619
Colorado	1919	91	783	936	570	2,697	5,004
	1914	63	502	481	214	916	1,652
Connecticut	1919	121	849	2,376	641	3,057	5,260
	1914	73	421	845	246	913	1,709
Delaware	1919	24	98	168	88	430	666
	1914	28	70	139	30	169	285
District of Columbia	1919	23	617	3,478	772	1,857	4,859
	1914	15	262	1,307	144	610	1,226
Florida	1919	27	105	395	74	762	1,112
	1914	30	72	90	36	171	346
Georgia	1919	60	1,553	1,903	1,003	5,253	9,080
	1914	42	726	817	278	1,520	2,455
Idaho	1919	20	161	212	92	432	788
	1914	13	58	44	26	107	212
Illinois	1919	462	8,779	14,379	8,367	41,096	73,097
	1914	325	5,309	9,359	2,646	12,137	20,088
Indiana	1919	235	1,713	4,053	1,237	7,213	11,195
	1914	190	1,263	2,505	555	2,823	4,604
Iowa	1919	182	1,739	4,183	1,285	6,871	11,535
	1914	176	1,519	2,850	721	3,100	5,086
Kansas	1919	115	584	1,263	446	2,394	3,886
	1914	73	342	945	203	731	1,252
Kentucky	1919	87	797	1,044	633	2,915	5,255
	1914	62	647	467	236	1,088	1,826
Louisiana	1919	41	818	832	443	3,076	5,096
	1914	24	248	379	90	443	850
Maine	1919	87	313	573	244	1,265	2,032
	1914	62	217	254	102	499	742
Maryland	1919	170	3,008	6,349	2,124	11,336	17,995
	1914	125	1,672	2,419	607	3,015	4,721
Massachusetts	1919	278	11,585	11,236	8,523	40,354	68,897
	1914	273	7,250	6,699	3,037	13,841	22,902
Michigan	1919	184	1,746	3,738	1,462	7,168	12,626
	1914	122	1,173	2,762	551	2,839	4,815
Minnesota	1919	117	1,959	2,340	1,223	5,688	10,056
	1914	102	978	1,363	441	2,244	3,877
Mississippi	1919	21	158	645	108	706	1,211
	1914	13	56	51	23	103	177
Missouri	1919	220	3,669	5,773	2,837	12,928	23,497
	1914	153	2,782	3,831	1,159	5,017	8,650
Montana	1919	37	134	218	$130	$452	$810
	1914	27	130	95	67	272	495
Nebraska	1919	53	607	1,496	425	2,251	3,666
	1914	43	399	767	175	888	1,466
New Hampshire	1919	22	60	132	49	252	411
	1914	17	40	74	24	99	165
New Jersey	1919	245	2,955	4,280	2,294	10,177	16,899
	1914	141	1,810	3,359	822	3,920	6,079
New York	1919	930	15,615	31,022	13,519	62,425	110,069
	1914	523	11,667	17,025	5,248	23,118	37,935
North Carolina	1919	66	316	1,011	245	1,146	2,035
	1914	29	110	234	42	306	475
North Dakota	1919	20	107	172	79	440	757
	1914	6	109	90	52	322	474
Ohio	1919	380	5,451	14,385	4,571	21,822	39,185
	1914	282	3,757	8,105	1,700	7,871	13,197
Oklahoma	1919	73	381	2,074	362	2,291	3,591
	1914	88	156	1,386	91	542	931
Oregon	1919	37	450	872	392	2,220	3,466
	1914	34	313	653	178	876	1,439
Pennsylvania	1919	839	11,010	26,742	8,954	42,530	71,120
	1914	652	8,038	14,271	3,306	14,628	24,088
Rhode Island	1919	87	292	1,050	277	1,461	2,368
	1914	65	312	406	155	694	1,138
South Carolina	1919	42	204	1,819	140	890	1,436
	1914	28	111	176	48	156	344
South Dakota	1919	19	195	409	141	912	1,608
	1914	13	129	223	69	459	688
Tennessee	1919	68	1,397	1,985	913	5,982	10,017
	1914	55	888	1,828	372	2,226	3,645
Texas	1919	193	1,950	4,368	1,407	8,229	13,309
	1914	123	968	1,919	410	2,016	3,526
Utah	1919	49	1,123	1,109	670	3,299	6,238
	1914	59	762	1,040	328	1,549	2,615
Vermont	1919	25	350	241	191	1,080	1,757
	1914	10	165	191	66	307	498
Virginia	1919	76	855	2,272	715	4,010	6,692
	1914	65	578	989	223	1,736	2,475
Washington	1919	119	1,596	1,491	1,339	5,684	10,302
	1914	100	638	642	366	1,360	2,475
West Virginia	1919	75	342	2,817	394	1,860	3,178
	1914	45	195	1,105	118	584	984
Wisconsin	1919	150	4,123	6,010	2,744	14,420	24,389
	1914	100	2,429	2,990	936	4,501	7,243
All other states	1919	53	141	312	156	660	1,091
	1914	27	68	71	41	148	295

TABLE 28.—DETAILED STATEMENT

	INDUSTRY AND 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	Total for the industry	6,624	122,028	7,051	5,415	7,906	6,008	95,648	Oc 107,004	Ja 86,491	104,181	45,452	55,046	1,066	2,677	317,043,923
2	Confectionery	3,149	93,982	3,146	3,609	6,337	4,397	76,493	Oc 88,216	Jy 67,064	85,792	29,383	52,954	799	2,656	219,634,526
3	Ice cream	3,475	28,046	3,905	1,806	1,569	1,611	19,155	Jy 24,836	Ja 14,600	18,389	16,069	2,092	207	21	97,409,397
4	Alabama	39	602	41	36	23	16	486	Se 567	Ja 422	483	321	160	2	.....	1,127,715
5	Arizona	19	119	23	10	2	2	82	No 104	Fe 71	97	52	44	.....	1	161,000
6	Arkansas	64	574	85	38	36	24	391	Au 463	Fe 331	412	270	137	5	.....	1,264,766
7	California	298	5,299	321	199	425	271	4,083	No 4,829	Ja 3,497	4,726	1,859	2,843	3	21	10,736,500
8	Colorado	91	1,123	90	80	83	87	783	Se 993	Ja 623	947	355	583	4	5	2,110,257
9	Connecticut	121	1,157	149	53	41	65	849	Jy 977	De 756	779	455	248	11	65	2,796,634
10	Delaware	24	130	25	6	1	.....	98	Ap 103	De 89	103	57	45	1	.....	425,320
11	District of Columbia	23	765	21	47	40	40	617	Jy 755	Ja 513	597	463	134	.....	.....	3,372,850
12	Florida	27	181	37	10	14	15	105	My 115	Fe 93	168	128	32	5	3	462,276
13	Georgia	60	1,984	48	111	192	80	1,553	Oc 1,850	My 1,355	1,863	749	1,101	3	10	4,120,222
14	Idaho	20	226	18	19	15	13	161	No 213	Ja 124	203	56	147	.....	.....	513,957
15	Illinois	462	11,026	458	578	686	525	8,779	Oc 10,690	Jy 7,407	9,485	4,597	4,549	78	261	30,663,459
16	Indiana	235	2,381	263	128	162	115	1,713	Se 1,898	Mh 1,523	1,846	946	820	17	63	5,128,756
17	Iowa	182	2,432	201	145	241	106	1,739	No 1,996	Mh 1,539	1,971	810	1,118	35	8	4,955,569
18	Kansas	115	845	140	44	47	30	584	Jy 657	Ja 479	632	323	308	1	.....	1,921,276
19	Kentucky	87	1,072	96	48	60	71	797	Fe 854	De 705	725	400	321	.....	4	2,423,624
20	Louisiana	41	1,029	28	55	79	49	818	Oc 900	Je 719	864	309	529	2	24	2,651,099
21	Maine	87	480	86	34	22	25	313	Oc 356	Ja 260	362	172	188	2	.....	1,062,844
22	Maryland	170	3,612	190	99	187	128	3,008	No 3,770	Jy 2,558	3,784	1,322	2,371	14	77	8,402,750
23	Massachusetts	278	13,613	291	498	627	612	11,585	Oc 12,593	Ja 10,708	11,856	3,651	6,909	225	1,071	28,133,527
24	Michigan	184	2,308	239	113	117	93	1,746	No 2,096	My 1,519	2,091	903	1,183	3	2	5,725,391
25	Minnesota	117	2,516	129	97	227	104	1,959	De 2,507	Je 1,594	2,488	814	1,672	1	1	5,508,985
26	Mississippi	21	238	27	25	16	12	158	Jy 201	Fe 107	173	127	45	1	.....	2,300,856
27	Missouri	220	4,655	260	187	401	138	3,669	No 4,215	Ja 3,368	4,119	1,850	2,238	7	24	12,265,529
28	Montana	37	195	40	8	8	5	134	Oc 153	Ja 107	153	60	91	2	.....	398,219
29	Nebraska	53	810	57	60	57	29	607	Oc 679	Ap 515	676	281	394	1	.....	1,856,822
30	Nevada	4	17	6	.....	.....	1	10	No 12	Fe 9	11	3	8	.....	.....	40,191
31	New Hampshire	22	108	30	7	5	6	60	Se 84	Mh 40	67	43	23	.....	1	224,404
32	New Jersey	245	3,713	250	103	266	139	2,955	Oc 3,924	Ja 2,317	3,311	1,480	1,737	32	62	7,820,491
33	New Mexico	12	41	10	3	1	1	26	Jy 30	Ja 24	27	22	4	1	.....	61,725
34	New York	930	19,971	1,001	802	1,269	1,284	15,615	Oc 16,730	Je 14,398	16,160	7,442	8,667	17	34	65,489,990
35	North Carolina	66	455	86	25	19	9	316	Se 379	Fe 246	381	236	139	3	3	1,121,610
36	North Dakota	20	157	18	16	13	3	107	De 123	Ja 82	133	56	77	.....	.....	596,894
37	Ohio	380	7,248	417	361	494	525	5,451	Oc 6,689	Ap 4,588	6,230	2,652	3,526	37	15	18,347,323
38	Oklahoma	73	563	79	47	40	16	381	Se 473	Ja 256	420	241	178	1	.....	2,271,356
39	Oregon	37	637	38	41	65	43	450	De 496	Fe 392	495	179	316	.....	.....	1,210,956
40	Pennsylvania	839	13,701	940	461	724	566	11,010	Se 11,804	Ja 10,018	11,756	5,842	5,485	209	220	36,859,964
41	Rhode Island	87	439	103	15	8	21	292	Jy 349	Fe 222	322	195	116	4	7	1,188,192
42	South Carolina	42	303	47	22	18	12	204	Oc 224	Fe 190	211	159	35	12	5	537,218
43	South Dakota	19	276	19	17	29	16	195	No 237	My 127	230	90	140	.....	.....	812,097
44	Tennessee	68	2,022	58	102	315	150	1,397	Oc 1,629	Mh 1,256	1,434	814	619	1	.....	5,277,774
45	Texas	193	2,563	128	143	234	108	1,950	Se 2,162	Ja 1,746	1,966	1,223	723	18	2	5,988,120
46	Utah	49	1,405	55	62	106	59	1,123	No 1,326	Ja 1,005	1,346	463	801	36	46	3,672,045
47	Vermont	25	424	27	16	11	20	350	Au 381	No 317	326	151	175	.....	.....	1,141,483
48	Virginia	76	1,149	54	99	98	43	855	Se 936	Ja 762	866	550	316	.....	.....	3,627,656
49	Washington	119	1,931	101	105	31	98	1,596	De 1,893	Fe 1,422	1,896	570	1,320	2	4	4,314,598
50	West Virginia	75	540	74	43	38	43	342	Je 414	Fe 263	341	261	76	4	.....	2,894,918
51	Wisconsin	150	4,943	126	196	313	185	4,123	No 4,714	Ja 3,708	4,625	1,431	2,350	206	638	12,973,196
52	Wyoming	18	50	21	1	.....	5	23	Je 27	Ja 19	24	19	5	.....	.....	81,513

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

BY STATES: 1919.

EXPENSES.										POWER.							
Salaries and wages.				Rent and taxes.		For materials.				Primary horsepower.							
											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]	Electric horsepower generated in establishments reporting.	
Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*								
19,612,246	20,183,783	76,159,866	1,191,586	6,233,367	27,517,170	360,517,580	8,291,590	637,209,168	268,399,998	179,991	51,250	1,513	11,800	150	11,5278	23,275	1
14,396,411	16,848,059	54,461,057	1,071,449	4,566,590	23,837,274	248,264,352	4,169,339	447,726,103	195,292,412	77,297	31,090	865	880	119	44,343	19,437	2
5,215,835	3,335,724	21,698,809	120,137	1,666,777	3,679,896	112,253,228	4,122,251	189,483,065	73,107,586	102,694	20,160	648	10,920	31	70,935	3,838	3
80,548	52,434	325,452	1,500	30,054	127,213	1,719,342	40,766	3,249,105	1,488,997	814	128	.....	52	.....	634	41	4
15,004	3,900	89,463	.....	13,318	5,296	321,635	11,869	514,546	181,042	121	.....	.....	.....	.....	121	.....	5
130,417	93,157	297,941	1,007	39,826	44,342	1,521,580	43,292	2,562,993	1,028,121	1,248	115	.....	232	.....	901	.....	6
572,962	773,357	3,257,866	16,332	385,136	595,257	13,189,781	303,521	23,225,675	9,732,373	5,766	465	.....	34	.....	5,267	.....	7
182,532	309,922	569,522	5,450	74,935	237,032	2,641,594	55,462	5,003,989	2,306,933	936	218	.....	2	.....	716	112	8
151,735	92,532	641,014	50	78,674	165,239	2,938,715	118,154	5,259,881	2,203,012	2,376	401	38	3	.....	1,934	108	9
19,020	65	88,089	200	8,192	11,715	418,502	11,690	666,480	236,288	168	22	.....	35	.....	111	.....	10
246,922	78,457	771,632	8,639	15,177	114,200	1,707,488	149,656	4,859,098	3,001,954	3,478	1,620	.....	.....	.....	1,858	.....	11
24,414	32,583	74,054	200	16,281	12,820	729,484	32,655	1,111,660	349,521	395	95	.....	33	.....	267	51	12
475,041	365,782	1,002,740	2,200	56,866	476,446	5,147,690	105,356	9,680,022	4,426,976	1,903	360	.....	.....	.....	1,543	429	13
40,982	60,680	92,346	1,311	16,140	61,927	421,339	10,201	788,317	356,777	212	36	.....	.....	.....	176	.....	14
2,230,727	1,839,691	8,367,426	138,312	564,072	3,404,204	40,313,450	782,071	73,096,890	32,001,369	14,379	2,292	1	376	4	11,706	1,634	15
387,439	368,737	1,236,592	3,334	164,999	556,288	7,047,712	165,362	11,194,689	3,981,615	4,053	1,056	161	53	.....	2,783	445	16
383,347	635,285	1,285,390	24,037	92,190	519,937	6,681,838	189,065	11,534,628	4,663,725	4,183	1,427	61	312	.....	2,383	182	17
112,252	136,427	446,203	1,548	46,188	106,068	2,309,460	84,179	3,886,336	1,492,697	1,263	237	40	35	.....	951	17	18
124,163	145,002	632,551	500	57,318	309,197	2,857,886	57,141	5,255,290	2,340,263	1,044	312	.....	39	.....	693	81	19
174,214	231,217	443,387	.....	31,918	145,668	3,031,577	44,712	5,096,473	2,020,184	832	80	.....	27	.....	725	.....	20
78,848	33,029	244,216	.....	39,125	65,736	1,238,736	26,620	2,032,509	767,153	573	76	.....	12	.....	485	.....	21
439,098	364,807	2,123,842	6,081	93,685	502,640	11,111,086	225,330	17,995,081	6,658,665	6,349	953	.....	277	.....	5,119	189	22
1,855,174	1,769,483	8,523,320	8,142	614,724	3,624,883	39,728,401	625,608	68,896,885	28,542,876	11,236	4,116	810	111	1	6,198	3,841	23
323,849	373,296	1,462,128	1,285	200,787	549,910	7,015,984	152,412	12,626,501	5,458,105	3,738	500	.....	29	.....	3,209	257	24
325,517	557,482	1,222,465	1,500	140,129	544,287	5,559,950	127,650	10,055,805	4,368,205	2,340	570	.....	8	.....	1,762	352	25
62,463	29,293	108,333	2,403	7,260	23,969	670,704	34,896	1,211,067	505,467	645	443	.....	25	.....	177	.....	26
542,586	1,030,099	2,837,406	16,777	259,219	1,608,464	12,633,637	294,381	23,497,553	10,569,535	5,773	2,675	.....	113	.....	2,985	1,273	27
17,260	19,293	129,690	1,250	25,048	7,057	435,150	17,052	809,950	357,748	218	.....	.....	5	.....	213	.....	28
156,163	171,010	425,092	6,034	31,540	119,404	2,180,635	70,136	3,665,749	1,414,978	1,496	200	.....	60	.....	1,236	54	29
.....	1,354	11,922	.....	4,200	994	87,493	1,850	153,710	64,367	38	.....	.....	.....	.....	38	.....	30
6,726	8,610	48,792	.....	8,376	2,914	245,599	5,954	410,799	159,246	132	.....	.....	15	.....	117	.....	31
437,999	570,908	2,294,250	5,229	200,211	420,783	9,879,369	297,560	16,898,953	6,722,024	4,280	1,234	110	661	.....	2,275	322	32
5,152	1,590	25,626	.....	3,660	2,756	120,366	2,199	198,767	76,202	45	.....	.....	.....	.....	45	.....	33
3,389,494	3,277,548	13,518,749	844,216	1,347,213	5,267,484	61,116,260	1,309,038	110,068,958	47,643,660	31,022	15,707	16	2,205	8	13,086	8,786	34
63,111	33,721	245,412	360	29,499	22,866	1,095,500	50,372	2,035,317	889,445	1,011	214	.....	307	.....	490	40	35
24,684	37,259	78,904	.....	4,508	44,342	428,647	11,716	757,057	316,694	172	42	.....	39	.....	91	28	36
1,349,734	1,185,763	4,571,129	4,820	344,820	1,805,337	21,312,276	509,503	39,185,0[illegible]4	17,363,305	14,385	1,964	.....	1,681	.....	10,740	978	37
118,015	78,951	362,344	750	31,774	51,751	2,206,493	84,946	3,590,714	1,299,275	2,074	1,300	.....	46	7	721	70	38
120,511	142,918	391,584	182	23,379	49,474	2,176,997	42,920	3,465,809	1,245,892	872	75	.....	26	.....	771	.....	39
2,145,452	1,742,556	8,953,733	31,585	485,816	2,556,826	41,411,279	1,118,612	71,120,044	28,590,153	26,742	7,487	258	3,641	2	15,354	2,526	40
53,820	19,085	276,699	270	25,289	45,371	1,415,281	45,499	2,368,490	907,710	1,050	.....	.....	118	2	930	.....	41
58,347	39,491	139,980	75	29,134	27,935	862,459	27,428	1,436,080	546,193	1,819	80	.....	.....	.....	1,739	.....	42
73,682	103,292	140,457	176	16,830	82,503	888,411	24,098	1,607,901	695,392	409	.....	.....	64	12	333	22	43
436,920	531,000	913,402	200	63,753	631,342	5,848,317	133,195	10,017,191	4,035,679	1,985	300	.....	16	.....	1,669	288	44
443,966	506,289	1,406,599	12,620	141,558	437,044	7,961,203	267,631	13,309,435	5,080,541	4,368	1,079	.....	350	.....	2,939	167	45
158,548	435,990	609,487	.....	46,273	119,762	3,249,875	49,042	6,238,375	2,939,458	1,109	150	.....	.....	.....	959	56	46
57,135	47,524	191,252	.....	11,728	66,672	1,067,291	12,748	1,756,560	676,521	241	100	.....	.....	.....	141	31	47
364,953	217,988	715,121	14,249	58,674	313,234	3,894,087	116,108	6,691,649	2,681,454	2,272	552	.....	28	.....	1,692	5	48
328,140	517,195	1,339,181	15,743	108,245	273,682	5,582,359	101,361	10,301,924	4,618,204	1,491	75	.....	.....	14	1,402	5	49
95,377	78,916	394,443	300	30,207	30,807	1,790,980	69,233	3,177,938	1,317,725	2,817	782	.....	705	.....	1,330	193	50
726,603	1,034,975	2,743,738	12,709	102,884	1,322,619	14,192,597	226,961	24,388,617	9,969,059	6,010	1,704	18	20	100	4,168	692	51
1,200	3,750	28,902	.....	3,525	1,473	111,025	4,379	222,624	107,220	108	8	.....	5	.....	95	.....	52

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

DEPARTMENT OF COMMERCE
BUREAU OF THE CENSUS
WASHINGTON

FOURTEENTH CENSUS OF THE UNITED STATES

MANUFACTURES: 1919

CLAY PRODUCTS AND ALLIED INDUSTRIES

BRICK AND TILE, TERRA-COTTA, AND FIRE-CLAY PRODUCTS POTTERY; SAND-LIME BRICK; CEMENT; LIME

Prepared under the supervision of EUGENE F. HARTLEY, Chief Statistician for Manufactures

CONTENTS.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1923

EXPLANATION OF TERMS.

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

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

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

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

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

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

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

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

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

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

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

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

Salaries and wages.—Under these heads are given the total payments during the year for salaries and wages, respectively. The Census Bureau has not undertaken to calculate the average annual earnings of either salaried employees or wage earners. Such averages would possess little real value, because they would be based on the earnings of employees of both sexes, of all ages, and of widely varying degrees of skill. Furthermore, so far as wage earners are concerned, it would be impossible to calculate accurately even so simple an average as this, since the number of wage earners fluctuates from month to month in every industry, and in some cases to a very great extent. The Census Bureau's figures for wage earners, as already explained, are averages based on the number employed on the 15th of each month, and while representing the number according to the pay rolls to whom wages were paid on that date, no doubt represent a larger number than would be required to perform the work in any industry if all were continuously employed during the year.

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

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

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

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

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

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

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

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

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

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

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

CLAY PRODUCTS.

General character of the industry.—The present report embraces the establishments engaged primarily in the manufacture of (1) brick and tile, terra-cotta, and fire-clay products; and (2) pottery. Table 1 presents the comparative statistics for the consolidated industry for the census years 1879 to 1919, inclusive, with percentages of increase for the census periods; and Table 2 the general statistics for the two component industries, "brick and tile, terra-cotta, and fire-clay products," and "pottery," for the census years 1919 and 1914, with percentages of increase for the respective industries and the per cent each is of the combined industry. At the census of 1909 and prior thereto, terra-cotta and fire-clay products were included with pottery.

TABLE 1.—CLAY PRODUCTS—COMPARATIVE SUMMARY 1879-1919.

	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	2,754	3,589	5,037	5,507	6,423	6,535	6,383	−23.3	−28.7	−8.5	−14.3	−1.7	2.4
Persons engaged	117,195	139,530	146,786	131,736	118,492	(2)	(2)	−16.0	−4.3	11.4	11.2	.....	.....
Proprietors and firm members	1,832	2,933	4,737	5,845	7,596	(2)	(2)	−37.5	−38.1	−19.0	−23.1	.....	.....
Salaried employees	10,514	9,710	9,353	7,442	5,203	(2)	(2)	8.3	3.8	25.7	43.0	.....	.....
Wage earners (average number)	104,849	126,887	132,696	118,449	105,693	123,156	76,576	−17.4	−4.4	12.0	12.1	(3)	(3)
Primary horsepower	434,836	465,152	451,186	360,280	252,502	131,821	(2)	−6.5	3.1	25.2	42.7	91.5	.....
Capital	$422,606,325	$324,564,093	$316,022,470	$230,882,977	$148,038,323	$108,705,670	$35,039,939	30.2	2.7	36.9	56.0	36.2	210.0
Salaries and wages	129,920,702	84,826,260	78,144,116	61,981,883	44,611,265	.....	.....	53.2	8.6	26.1	38.9	.....	.....
Salaries	21,844,339	13,252,512	11,252,037	8,158,213	5,036,195	(2)	(2)	64.8	17.8	37.9	62.0	.....	.....
Wages	108,076,363	71,573,748	66,892,079	53,823,670	39,575,070	(2)	(2)	51.0	7.0	24.3	36.0	.....	.....
Paid for contract work	645,997	739,210	777,724	394,451	275,900	(2)	(2)	−12.6	−5.0	97.2	42.9	.....	.....
Rents and taxes	8,074,036	2,176,745	1,820,840	[4] 1,447,248	[4] 1,408,625	(2)	(2)	271.0	19.5	25.8	2.7	.....	.....
Cost of materials	88,282,189	54,754,734	45,647,007	32,907,961	22,921,384	18,257,998	12,683,897	61.2	20.0	38.7	43.6	25.5	43.9
Value of products	283,342,106	172,864,051	168,895,395	135,352,854	95,533,862	89,827,785	41,810,920	63.9	2.3	24.8	41.7	6.4	115.0
Value added by manufacture[5]	195,059,917	118,109,317	123,248,358	102,444,893	72,612,478	71,569,787	29,127,023	65.2	−4.2	20.3	41.1	1.5	146.0

[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.

TABLE 2.—CLAY PRODUCTS—COMPONENT INDUSTRIES: 1919 AND 1914.

	BRICK AND TILE, TERRA-COTTA AND FIRE-CLAY PRODUCTS.					POTTERY.				
	1919	1914	Per cent of increase,[1] 1914-1919	Per cent of the clay products industry.		1919	1914	Per cent of increase,[1] 1914-1919	Per cent of the clay products industry.	
				1919	1914				1919	1914
Number of establishments	2,414	3,239	−25.5	87.7	90.9	340	350	−2.9	12.3	9.1
Persons engaged	86,503	110,772	−21.9	73.8	78.8	30,692	28,758	3.1	26.2	21.2
Proprietors and firm members	1,649	2,721	−39.4	90.0	92.8	183	212	−13.7	10.0	7.2
Salaried employees	7,939	7,869	0.9	75.5	81.0	2,575	1,841	39.9	24.5	19.0
Wage earners (average number)	76,915	100,182	−23.2	73.4	79.0	27,934	26,705	4.6	26.6	21.0
Primary horsepower	405,746	442,813	−8.4	93.3	95.2	29,090	22,339	30.2	6.7	4.8
Capital	$355,848,355	$279,860,012	27.2	84.2	86.2	$66,757,970	$44,704,081	47.3	15.8	13.8
Salaries and wages	94,096,992	65,453,573	43.8	72.4	77.2	35,823,710	19,372,687	84.9	27.6	22.8
Salaries	15,840,907	10,546,155	50.2	72.5	79.6	6,003,432	2,706,357	122.0	27.5	20.4
Wages	78,256,085	54,907,418	42.5	72.4	76.7	29,820,278	16,666,330	78.9	27.6	23.3
Paid for contract work	528,613	696,104	−24.1	81.8	94.2	117,384	43,106	172.0	18.2	5.8
Rent and taxes	5,234,049	1,862,619	181.0	64.8	85.6	2,839,987	314,126	804.0	35.2	14.4
Cost of materials	67,488,113	42,723,178	58.0	76.4	78.0	20,794,076	12,031,556	72.8	23.6	22.0
Value of products	208,422,920	135,921,445	53.3	73.6	78.6	74,919,186	36,942,606	103.0	26.4	21.4
Value added by manufacture[2]	140,934,807	93,198,267	51.2	72.3	78.9	54,125,110	24,911,050	117.0	27.7	21.1

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

BRICK AND TILE, TERRA-COTTA, AND FIRE-CLAY PRODUCTS.

GENERAL STATISTICS.

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 value of products, 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 14.

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 conditions existing during the year. The females employed as wage earners constituted but 1.5 per cent of the total number.

Prevailing hours of labor.—The statistics presented in Table 6 show a very material reduction in the hours of labor per week. In 1914, 52.7 per cent of the wage earners were employed in plants where the prevailing hours of labor per week were 60 or over, as compared with 34 per cent in 1919. On the other hand, 23.6 per cent in 1919 were employed in establishments where the prevailing hours of labor were 48 per week or less and 10.9 per cent in 1914.

Size of establishments, by average number of wage earners.—The industry is one of relatively small units, as shown in Table 7, the average number of wage earners per establishment being 31 in 1914 and 32 in 1919, no material change. In 1919 the establishments employing over 250 wage earners reported 9.2 per cent of the total number, and in 1914, 15.5 per cent.

Size of establishments, by value of products.—The grouping by value of products necessarily reflects the general increase in values. The average value of products per establishment increased from $42,000 in 1914 to $86,000 in 1919, but the increase is essentially due to high prices, for on a quantity basis the production of the various products was, in general, materially less in 1919 than in 1914. This condition accounts for the changes from lower to higher groups, as shown in Table 8.

Character of ownership.—Table 9 presents the statistics for establishments classified according to form of ownership. The industry includes a large number of individual establishments, and likewise those classed as "All other," which primarily consists of firms; but the decrease in the total number of establishments in 1919 as compared with 1914 is chiefly in these two groups. The number of establishments owned by individuals shows a decrease of 42 per cent and the "All other" group 41 per cent, while the corporations show a decrease of but 8 per cent. The corporation group employed 84.3 per cent of the wage earners in 1919 and 80.6 per cent in 1914, and reported 86 per cent of the products in 1919 and 83 per cent in 1914.

Number and horsepower of types of prime movers.—Table 10 presents the power statistics for the industry for 1919 and 1914. Electric power is a growing factor, and of the total primary power, 32.9 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 20 per cent in 1914. In 1909 the industry, which did not include products other than brick and tile, utilized 7 per cent of the primary power in electric motors.

Fuel consumed.—Table 11 presents the statistics for fuel by kinds and by states. The figures for gas include both natural and manufactured gas, the former being the chief factor in the natural-gas states.

TABLE 3.—PRINCIPAL STATES, RANKED BY VALUE OF PRODUCT: 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	2,414	76,915	100.0	....	$208,423	100.0	....	$140,936	100.0	...
Pennsylvania	303	15,897	20.7	1	43,842	21.0	1	27,330	19.4	1
Ohio	341	12,060	15.7	2	32,173	15.4	2	22,212	15.8	2
Illinois	144	5,627	7.3	3	17,564	8.4	3	12,734	9.0	3
Missouri	65	4,469	5.8	4	11,456	5.5	4	7,538	5.4	4
New Jersey	67	3,544	4.6	6	10,127	4.9	5	7,349	5.2	5
Indiana	151	3,648	4.7	5	9,881	4.8	6	6,444	4.6	7
New York	118	3,246	4.2	7	8,813	4.2	7	6,574	4.7	6
Iowa	113	2,452	3.2	8	8,127	3.9	8	5,488	3.9	8
Kentucky	47	2,349	3.1	9	5,686	2.7	9	3,682	2.6	9
California	60	1,747	2.3	10	5,211	2.5	10	3,387	2.4	10
Texas	58	1,663	2.2	11	4,167	2.0	11	2,833	2.0	11
Georgia	47	1,617	2.1	12	3,734	1.8	12	2,457	1.8	13
Kansas	20	1,136	1.5	18	3,407	1.6	13	2,208	1.6	14
Michigan	48	852	1.1	20	3,339	1.6	14	2,521	1.6	12
North Carolina	95	1,338	1.7	14	3,212	1.6	15	2,206	1.6	15
Maryland	30	1,207	1.6	17	3,207	1.5	16	2,095	1.5	16
Alabama	42	1,359	1.8	13	3,088	1.5	17	2,055	1.5	17
Tennessee	46	1,265	1.6	16	2,783	1.3	18	1,901	1.3	18
Virginia	45	1,331	1.7	15	2,738	1.3	19	1,888	1.3	19
Colorado	43	812	1.1	22	2,505	1.2	20	1,731	1.2	21
West Virginia	36	1,032	1.3	19	2,316	1.1	21	1,531	1.1	22
Connecticut	30	835	1.1	21	2,294	1.1	22	1,831	1.3	20
Minnesota	34	799	1.0	23	$2,293	1.1	23	$1,484	1.1	23
Massachusetts	35	739	1.0	24	1,818	0.9	24	1,293	0.9	24
Washington	35	664	0.9	25	1,783	0.9	25	1,227	0.9	25
Oklahoma	22	628	0.8	26	1,679	0.8	26	1,036	0.7	26
Wisconsin	50	414	0.5	31	1,241	0.6	27	851	0.6	28
South Carolina	23	566	0.7	27	1,156	0.6	28	699	0.5	31
Utah	21	440	0.6	29	1,144	0.6	29	900	0.6	27
Arkansas	21	354	0.5	33	1,074	0.5	30	766	0.5	30
Nebraska	29	402	0.5	32	1,065	0.5	31	825	0.6	29
Mississippi	28	472	0.6	28	925	0.5	32	633	0.4	32
Louisiana	18	434	0.6	30	741	0.4	33	534	0.4	33
Maine	10	254	0.3	34	704	0.3	34	445	0.3	34
Montana	14	145	0.2	38	505	0.3	35	305	0.2	36
New Hampshire	9	160	0.2	35	465	0.2	36	360	0.3	35
Oregon	23	152	0.2	37	386	0.2	37	294	0.2	37
North Dakota	5	140	0.2	39	308	0.1	38	227	0.2	39
Idaho	12	109	0.1	40	303	0.1	39	231	0.2	38
Delaware	11	85	0.1	43	223	0.1	40	150	0.1	41
Wyoming	10	46	0.1	44	195	0.1	41	153	0.1	40
Arizona	13	99	0.1	41	188	0.1	43	132	0.1	43
Florida	11	156	0.2	36	181	0.1	44	127	0.1	44
South Dakota	3	23	(1)	46	64	(1)	45	43	(1)	46
All other states	10	139	0.2	....	312	0.1	....	226	0.2	...

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

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

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	86,503	84,075	2,428	97.2	2.8
	1914	110,772	108,644	2,128	98.1	1.9
	1909	85,764	85,234	530	99.3	0.7
Proprietors and officials	1919	5,999	5,871	128	97.9	2.1
	1914	6,705	6,548	157	97.7	2.3
	1909	7,503	7,353	150	98.0	2.0
Proprietors and firm members	1919	1,649	1,578	71	95.7	4.3
	1914	2,721	2,602	119	95.6	4.4
	1909	4,285	4,149	136	96.8	3.2
Salaried officers of corporations	1919	1,664	1,613	51	96.9	3.1
	1914	1,560	1,526	34	97.8	2.2
	1909	1,118	1,107	11	99.0	1.0
Superintendents and managers	1919	2,686	2,680	6	99.8	0.2
	1914	2,424	2,420	4	99.8	0.2
	1909	2,100	2,097	3	99.8	0.2
Clerks and other subordinate salaried employees.	1919	3,589	2,446	1,143	68.2	31.8
	1914	3,885	3,103	782	79.9	20.1
	1909	1,733	1,434	299	82.7	17.3
Wage earners (average number)	1919	76,915	75,758	1,157	98.5	1.5
	1914	100,182	98,993	1,189	98.8	1.2
	1909	76,528	76,447	81	99.9	0.1
16 years of age and over	1919	76,447	75,303	1,144	98.5	1.5
	1914	99,327	98,179	1,148	98.9	1.1
	1909	75,258	75,178	80	99.9	0.1
Under 16 years of age	1919	468	455	13	97.2	2.8
	1914	855	814	41	95.2	4.8
	1909	1,270	1,269	1	99.9	(1)

[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	76,915	56,190	*55,866*	60,269	70,332	79,561	84,952	88,715	**90,329**	90,615	88,913	81,997	74,641	61.4
Males	75,758	55,209	*54,892*	59,317	69,319	78,474	83,804	87,496	**89,691**	89,329	87,592	80,664	73,309	61.2
Females	1,157	981	*974*	952	1,013	1,087	1,148	1,219	1,238	1,286	1,321	**1,333**	1,332	73.1
1914	100,182	77,966	*76,458*	83,720	101,780	117,738	**123,877**	123,554	121,503	113,269	99,643	85,952	76,724	61.7
Alabama	1,359	1,368	1,340	1,350	*1,296*	1,381	1,298	1,314	1,424	1,308	**1,427**	1,383	1,329	90.8
Arizona	99	*35*	58	88	101	102	106	**149**	137	146	134	91	41	23.5
Arkansas	354	*167*	182	234	366	370	400	434	**476**	460	435	377	347	35.1
California	1,747	*1,218*	1,241	1,369	1,619	1,712	1,837	1,953	2,003	1,921	1,923	2,044	**2,124**	57.3
Colorado	812	*465*	572	650	686	847	982	943	**1,066**	966	929	884	754	43.6
Connecticut	835	*393*	*393*	443	752	1,061	1,130	**1,149**	1,122	1,062	992	828	695	34.2
Delaware	85	*40*	*40*	51	87	114	123	98	117	113	99	90	48	32.5
Florida	156	*139*	142	149	154	160	149	156	166	161	**169**	**169**	158	82.2
Georgia	1,617	*1,217*	1,337	1,383	1,555	1,621	1,586	1,713	1,775	1,802	**1,872**	1,819	1,724	65.0
Idaho	109	44	*43*	44	72	145	**184**	180	167	146	114	92	77	23.4

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

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.	
Illinois	5,627	*3,239*	3,257	3,842	4,937	5,768	6,245	6,629	6,879	7,005	7,443	6,733	5,547	43.5
Indiana	3,648	*2,448*	2,621	2,766	3,367	3,931	4,189	4,192	4,289	4,495	4,404	3,774	3,300	54.5
Iowa	2,452	*1,104*	1,223	1,908	2,470	2,872	3,103	3,131	3,199	3,144	2,995	2,542	1,733	34.5
Kansas	1,136	*630*	713	822	1,049	1,120	1,304	1,337	1,409	1,398	1,374	1,358	1,118	44.7
Kentucky	2,349	2,116	*1,981*	2,090	2,363	2,376	2,349	2,631	2,575	2,747	2,702	2,166	2,092	72.1
Louisiana	434	211	*209*	249	466	499	486	529	534	549	523	483	470	38.1
Maine	254	*108*	117	131	167	306	398	393	409	373	339	181	126	26.4
Maryland	1,207	*943*	981	978	1,034	1,270	1,275	1,275	1,400	1,370	1,383	1,343	1,232	67.4
Massachusetts	739	380	347	*326*	536	860	1,034	1,109	1,116	982	838	688	652	29.2
Michigan	852	*498*	521	630	769	1,029	1,082	1,046	1,060	1,049	950	826	764	47.0
Minnesota	709	*348*	381	397	616	841	1,077	1,146	1,150	1,115	977	880	660	30.3
Mississippi	472	*335*	348	369	480	512	540	555	612	573	501	458	381	54.7
Missouri	4,469	*3,452*	3,534	3,623	4,172	4,664	4,764	4,865	4,952	5,026	5,292	4,781	4,503	65.2
Montana	145	76	*68*	104	161	191	225	261	195	137	138	118	66	26.1
Nebraska	402	*100*	155	232	409	522	576	613	627	608	456	362	164	15.9
New Hampshire	169	*42*	45	50	136	335	309	320	287	201	146	95	62	12.5
New Jersey	3,544	2,483	*2,190*	2,325	2,732	3,207	3,659	4,077	4,398	4,408	4,429	4,422	4,198	49.4
New York	3,246	1,381	*1,264*	1,488	2,444	3,755	4,415	4,606	4,557	4,255	4,016	3,577	3,194	27.4
North Carolina	1,338	*752*	759	950	1,446	1,622	1,577	1,703	1,799	1,752	1,565	1,258	873	41.8
North Dakota	140	*114*	*114*	118	121	129	204	208	169	134	162	119	88	42.3
Ohio	12,060	*9,436*	9,452	10,163	11,193	12,217	13,014	13,667	13,510	13,817	13,666	12,817	11,771	68.3
Oklahoma	628	*546*	502	543	618	710	689	706	758	711	679	641	633	45.6
Oregon	152	*27*	29	34	92	129	237	267	275	224	211	157	142	9.8
Pennsylvania	15,897	15,710	14,715	*14,637*	15,048	15,211	15,618	16,201	16,685	17,046	16,904	16,576	16,413	85.9
South Carolina	566	403	*402*	482	528	555	563	619	701	733	699	579	528	54.8
South Dakota	23	*3*	*3*	*3*	22	38	39	37	30	29	29	27	16	7.7
Tennessee	1,265	822	*811*	925	1,084	1,275	1,480	1,504	1,679	1,609	1,470	1,308	1,213	48.3
Texas	1,663	*1,079*	1,197	1,354	1,627	1,795	1,831	1,880	2,059	1,847	1,747	1,794	1,746	52.4
Utah	440	*261*	274	337	377	445	530	554	594	580	494	434	400	43.9
Virginia	1,331	*899*	930	1,002	1,224	1,329	1,455	1,559	1,614	1,663	1,615	1,420	1,252	54.1
Washington	664	405	*386*	492	544	680	755	837	818	804	818	757	672	46.1
West Virginia	1,032	*788*	*788*	903	993	1,047	1,158	1,198	1,183	1,196	1,179	1,018	933	65.8
Wisconsin	414	*94*	96	111	252	589	738	727	709	624	470	349	209	12.7
Wyoming	46	7	*5*	20	45	62	77	76	75	70	40	29	46	6.5

TABLE 6.—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..	76,915	1,971	500	15,676	6,071	16,342	9,275	25,392	788
1914..	100,182	(2)	(2)	10,883	4,489	18,186	13,844	51,046	1,734
Alabama	1,359	108	8	11	19	137	341	547	188
Arizona	99	14	.....	39	.....	46	.....	.....	.....
Arkansas	354	.....	.....	.....	.....	72	46	236	.....
California	1,747	.....	.....	893	32	810	12	.....	.....
Colorado	812	181	.....	200	.....	367	.....	47	17
Connecticut	835	27	13	150	142	421	.....	82	.....
Delaware	85	.....	.....	3	16	2	6	58	.....
Florida	156	26	12	15	13	.....	3	87	.....
Georgia	1,617	.....	85	80	62	218	270	902	.....
Idaho	109	.....	.....	72	.....	18	6	13	.....
Illinois	5,627	34	30	2,274	621	1,240	95	1,332	1
Indiana	3,648	58	.....	586	570	1,518	161	755	.....
Iowa	2,452	.....	.....	152	5	553	21	1,721	.....
Kansas	1,136	48	25	96	.....	458	43	466	.....
Kentucky	2,349	36	74	666	198	302	458	615	.....
Louisiana	434	8	34	17	.....	12	79	197	87
Maine	254	.....	.....	4	12	144	.....	94	.....
Maryland	1,207	51	.....	432	28	40	149	507	.....
Massachusetts	739	45	.....	355	127	196	.....	13	3
Michigan	852	121	.....	278	113	101	114	125	.....
Minnesota	709	.....	.....	132	.....	157	.....	510	.....
Mississippi	472	14	.....	67	9	47	33	301	1
Missouri	4,469	65	.....	259	582	644	1,009	1,910	.....
Montana	145	16	.....	94	.....	.....	26	4	5
Nebraska	402	15	.....	69	8	3	.....	307	.....
New Hampshire	169	.....	.....	54	.....	115	.....	.....	.....
New Jersey	3,544	201	.....	308	1,007	1,300	537	131	.....
New York	3,246	111	.....	1,165	288	767	284	631	.....
North Carolina	1,338	91	52	119	88	1	408	551	28
North Dakota	140	.....	.....	.....	7	85	.....	48	.....
Ohio	12,060	76	76	1,624	1,587	2,552	2,052	3,900	193
Oklahoma	628	.....	15	110	.....	27	19	339	118
Oregon	152	.....	.....	120	.....	13	19	.....	.....
Pennsylvania	15,897	393	31	3,049	1,245	2,787	2,370	5,964	58
South Carolina	566	30	30	.....	35	19	124	311	17
South Dakota	23	.....	.....	.....	.....	.....	.....	23	.....
Tennessee	1,265	5	5	53	14	149	259	780	.....
Texas	1,663	8	.....	355	39	197	137	927	.....
Utah	440	1	.....	395	.....	37	7	.....	.....
Virginia	1,331	98	.....	228	34	374	70	527	.....
Washington	664	.....	.....	595	.....	61	.....	8	.....
West Virginia	1,032	87	10	447	.....	176	91	151	70
Wisconsin	414	.....	.....	49	.....	72	26	267	.....
Wyoming	46	.....	.....	29	10	.....	.....	5	2
All other states	139	3	.....	32	.....	104	.....	.....	.....

[1] Includes 48 and under for 1914.

[2] Corresponding figures not available.

TABLE 7.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR STATES: 1919 AND 1914.

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	2,414	76,915	31	638	1,792	736	9,096	592	20,220	260	18,125	139	20,580	14	4,686	4	2,416	.....	.....
1914	3,239	100,182	30	1,031	2,928	996	11,910	650	21,315	320	22,416	173	26,122	31	9,986	7	4,504	1	1,001
Alabama	42	1,359	.....	11	44	13	161	10	353	5	300	2	248	1	253	.....	.....	.....	.....
Arizona	13	99	2	5	12	6	87	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	21	354	.....	7	12	10	120	2	85	2	137	.....	.....	.....	.....	.....	.....	.....	.....
California	60	1,747	1	13	29	22	296	16	549	6	486	2	387	.....	.....	.....	.....	.....	.....
Colorado	43	812	2	17	41	15	182	7	233	.....	.....	2	356	.....	.....	.....	.....	.....	.....
Connecticut	30	835	1	2	4	9	143	15	424	1	52	2	212	.....	.....	.....	.....	.....	.....
Delaware	11	85	.....	7	19	3	31	1	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Florida	11	156	.....	3	13	6	77	2	66	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	47	1,617	.....	12	38	10	124	12	445	10	664	3	346	.....	.....	.....	.....	.....	.....
Idaho	12	109	1	5	20	5	54	1	35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	144	5,627	3	40	107	27	265	35	1,154	26	1,810	11	1,634	2	657	.....	.....	.....	.....
Indiana	151	3,648	1	68	188	33	380	27	959	14	910	7	945	1	266	.....	.....	.....	.....
Iowa	113	2,452	1	47	160	32	357	15	541	14	880	4	514	.....	.....	.....	.....	.....	.....
Kansas	29	1,136	1	1	2	6	90	14	530	6	384	1	130	.....	.....	.....	.....	.....	.....
Kentucky	47	2,349	.....	8	26	13	170	15	448	3	262	7	1,087	1	356	.....	.....	.....	.....
Louisiana	18	434	.....	1	5	13	172	2	52	1	78	1	127	.....	.....	.....	.....	.....	.....
Maine	19	254	1	9	18	5	56	3	79	.....	.....	1	101	.....	.....	.....	.....	.....	.....
Maryland	30	1,207	.....	6	30	9	118	8	258	5	411	2	390	.....	.....	.....	.....	.....	.....
Massachusetts	35	739	.....	3	7	21	264	9	351	2	117	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	48	852	.....	17	28	19	210	8	292	3	210	1	112	.....	.....	.....	.....	.....	.....
Minnesota	34	799	.....	5	15	20	264	5	165	3	210	1	145	.....	.....	.....	.....	.....	.....
Mississippi	28	472	2	9	35	10	105	6	216	.....	.....	1	116	.....	.....	.....	.....	.....	.....
Missouri	65	4,469	.....	14	38	14	153	15	527	9	624	10	1,664	1	312	2	1,151	.....	.....
Montana	14	145	.....	7	21	6	84	1	40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Nebraska	29	402	.....	10	29	12	158	7	215	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Hampshire	9	169	.....	1	1	5	66	3	102	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	67	3,544	1	8	16	13	198	26	870	7	583	11	1,526	1	351	.....	.....	.....	.....
New York	118	3,246	1	14	48	45	625	44	1,341	12	870	2	362	.....	.....	.....	.....	.....	.....
North Carolina	95	1,338	1	32	93	43	496	16	494	2	127	1	128	.....	.....	.....	.....	.....	.....
North Dakota	5	140	.....	1	1	2	27	1	27	1	85	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	341	12,060	5	112	306	65	779	81	2,983	56	3,891	18	2,756	4	1,345	.....	.....	.....	.....
Oklahoma	22	628	.....	3	10	9	155	7	245	3	218	.....	.....	.....	.....	.....	.....	.....	.....
Oregon	23	152	1	12	28	10	124	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	303	15,897	3	25	83	85	1,103	103	3,545	44	3,104	38	5,651	3	1,146	2	1,265	.....	.....
South Carolina	23	566	.....	4	7	7	93	11	367	1	99	.....	.....	.....	.....	.....	.....	.....	.....
South Dakota	3	23	.....	1	5	2	18	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	46	1,265	.....	17	56	15	160	8	299	2	131	4	619	.....	.....	.....	.....	.....	.....
Texas	58	1,663	.....	9	28	21	266	19	614	7	502	2	253	.....	.....	.....	.....	.....	.....
Utah	21	440	.....	12	20	4	51	2	59	1	73	2	237	.....	.....	.....	.....	.....	.....
Virginia	45	1,331	.....	8	21	18	233	13	468	4	277	2	332	.....	.....	.....	.....	.....	.....
Washington	35	664	.....	10	27	14	166	9	346	2	125	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	36	1,032	1	6	14	14	175	8	256	6	385	1	202	.....	.....	.....	.....	.....	.....
Wisconsin	50	414	2	26	59	17	163	4	125	1	67	.....	.....	.....	.....	.....	.....	.....	.....
Wyoming	10	46	.....	7	21	3	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

TABLE 8.—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	2,414	3,239	76,915	100,182	$208,422,920	$135,921,445	$140,934,807	$93,198,267
Less than $5,000	301	901	568	2,641	858,127	2,359,272	605,351	1,789,845
$5,000 to $20,000	623	1,031	3,804	10,848	6,744,243	10,994,434	4,813,242	8,140,098
$20,000 to $100,000	374	961	19,413	35,473	43,800,044	44,703,952	30,159,764	30,598,125
$100,000 to $500,000	568	342	40,660		116,641,940		79,842,346	
$500,000 to $1,000,000	39	2	8,377	51,220	25,656,833	77,863,787	16,617,829	52,670,199
$1,000,000 and over	9	2	4,093		14,721,733		8,896,275	
	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	12.5	27.8	0.7	2.7	0.4	1.7	0.4	1.9
$5,000 to $20,000	25.8	31.8	4.9	10.8	3.2	8.1	3.4	8.8
$20,000 to $100,000	36.2	29.7	25.2	35.4	21.0	32.9	21.4	32.8
$100,000 to $500,000	23.5	10.5	52.9		56.0		56.7	
$500,000 to $1,000,000	1.6	0.1	10.9	51.1	12.3	57.3	11.8	56.5
$1,000,000 and over	0.4	0.1	5.3		7.1		6.3	

TABLE 9.—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	598	1,415	401	76,915	6,757	64,857	5,301	8.8	84.3	6.9	$208,422,920	$15,621,257	$179,095,183	$13,706,480	7.5	85.9	6.6
1914	1,026	1,536	677	100,182	10,722	80,770	8,690	10.7	80.6	8.7	135,921,445	12,209,359	112,835,699	10,877,387	9.0	83.0	8.0
Alabama	11	24	7	1,359	317	956	86	23.3	70.3	6.3	3,088,485	533,817	2,394,514	160,154	17.3	77.5	5.2
Arizona	10	2	1	99	66	[1] 33	.....	66.7	33.3	.....	188,034	152,744	[1] 35,290	.....	81.2	18.7	.....
Arkansas	5	11	5	354	5	264	85	1.4	74.6	24.0	1,073,969	14,295	930,994	128,680	1.3	86.7	12.0
California	17	39	4	1,747	150	1,556	41	8.6	89.1	2.3	5,211,390	499,079	4,587,068	125,243	9.6	88.0	2.4
Colorado	11	28	4	812	27	767	18	3.3	94.5	2.2	2,504,658	96,927	2,360,041	47,690	3.9	94.2	1.9
Connecticut	8	19	3	835	122	684	29	14.6	81.9	3.5	2,204,001	322,607	1,875,479	95,915	14.1	81.8	4.2
Delaware	7	3	1	85	[1] 55	30	.....	64.7	35.3	.....	222,740	[1] 131,259	91,481	.....	58.9	41.1	.....
Florida	2	2	7	156	.....	[2] 32	124	.....	84.6	79.5	181,430	.....	[2] 29,426	152,004	.....	16.2	83.8
Georgia	14	29	4	1,617	250	1,292	75	15.5	79.9	4.6	3,733,823	609,944	2,924,205	199,674	16.3	78.3	5.3
Idaho	5	6	1	109	[1] 24	85	.....	22.0	78.0	.....	302,987	[1] 56,703	246,284	.....	18.7	81.3	.....
Illinois	37	84	23	5,627	430	4,428	769	7.6	78.7	13.7	17,564,017	1,188,742	14,003,185	2,369,090	6.8	79.7	13.5
Indiana	41	79	31	3,648	187	3,322	139	5.1	91.1	3.8	9,880,579	412,253	9,076,439	391,887	4.2	91.9	4.0
Iowa	24	61	28	2,452	84	2,056	312	3.4	83.8	12.7	8,127,157	218,074	6,783,312	1,125,771	2.7	83.5	13.9
Kansas	4	23	2	1,136	[1] 206	930	.....	18.2	81.9	.....	3,407,019	[1] 552,696	2,854,323	.....	16.2	83.8	.....
Kentucky	8	30	9	2,349	46	2,195	108	2.0	93.4	4.6	5,686,473	106,343	5,363,918	216,212	1.9	94.3	3.8
Louisiana	10	8	.....	434	120	314	.....	27.6	72.4	.....	740,610	170,788	569,822	.....	23.1	76.9	.....
Maine	8	9	2	254	[1] 40	214	.....	15.8	84.3	.....	704,484	[1] 134,880	569,604	.....	19.2	80.9	.....
Maryland	6	21	3	1,207	68	1,107	32	5.6	91.7	2.7	3,207,465	166,166	2,997,103	44,196	5.2	93.4	1.4
Massachusetts	9	22	4	739	122	579	38	16.5	78.3	5.1	1,817,512	266,727	1,488,411	62,374	14.7	81.9	3.4
Michigan	13	25	10	852	127	618	107	14.9	72.5	12.6	3,339,381	612,464	2,401,191	325,726	18.3	71.9	9.8
Minnesota	5	19	10	799	37	625	137	4.6	78.2	17.1	2,293,396	58,450	1,885,486	349,460	2.5	82.2	15.2
Mississippi	15	5	8	472	144	114	214	30.5	24.2	45.3	925,222	240,011	186,392	498,819	25.9	20.1	53.9
Missouri	15	45	5	4,469	508	3,919	42	11.4	87.7	0.9	11,455,779	1,408,645	9,978,961	68,173	12.3	87.1	0.6
Montana	2	9	3	145	.....	129	[2] 16	.....	89.0	11.0	505,053	9,520	478,388	[2] 26,665	.....	94.9	5.1
Nebraska	8	14	7	402	75	289	38	18.7	71.9	9.5	1,065,264	235,250	719,595	110,413	22.1	67.5	10.4
New Hampshire	6	3	.....	169	67	102	.....	39.6	60.4	.....	465,204	190,214	274,990	.....	40.9	59.1	.....
New Jersey	15	48	4	3,544	194	3,252	98	5.5	91.8	2.8	10,127,176	449,435	9,454,447	223,294	4.4	93.4	2.2
New York	33	63	22	3,246	527	2,201	518	16.2	67.8	16.0	8,813,281	1,279,829	6,212,910	1,320,542	14.5	70.5	15.0
North Carolina	35	31	20	1,338	207	763	278	22.2	57.0	20.8	3,211,892	632,471	1,973,851	605,570	19.7	61.5	18.9
North Dakota	1	3	1	140	.....	[3] 140	.....	.....	100.0	.....	308,550	.....	[3] 308,550	.....	.....	100.0	.....
Ohio	64	215	62	12,060	492	10,961	607	4.1	90.9	5.0	32,172,576	672,210	30,149,117	1,351,249	2.1	93.7	4.2
Oklahoma	1	19	2	628	.....	573	[2] 55	.....	91.2	8.8	1,679,129	.....	1,568,628	[2] 110,501	.....	93.4	6.6
Oregon	14	5	4	152	47	82	23	30.9	53.9	15.1	385,581	106,904	240,472	38,205	27.7	62.4	9.9
Pennsylvania	41	224	38	15,897	611	14,461	825	3.8	91.0	5.2	43,842,120	1,430,812	39,933,828	2,477,480	3.3	91.1	5.6
South Carolina	9	8	6	566	147	298	121	26.0	52.6	21.4	1,155,681	319,019	564,402	272,260	27.6	48.8	23.6
South Dakota	.....	3	.....	23	.....	23	.....	.....	100.0	.....	63,571	.....	63,571	.....	.....	100.0	.....
Tennessee	15	22	9	1,265	285	936	44	22.5	74.0	3.5	2,782,669	641,676	2,073,087	67,906	23.1	74.4	2.4
Texas	15	39	4	1,663	375	1,209	79	22.5	72.7	4.8	4,166,571	764,203	3,250,899	151,469	18.3	78.0	3.6
Utah	7	9	5	440	13	399	28	3.0	90.7	6.4	1,144,021	20,605	1,072,120	51,296	1.8	93.7	4.5
Virginia	13	23	9	1,331	324	943	64	24.3	70.8	4.8	2,738,298	513,333	2,093,613	131,352	18.7	76.5	4.8
Washington	6	23	6	664	53	574	37	8.0	86.4	5.6	1,782,566	132,646	1,544,384	105,536	7.4	86.6	5.9
West Virginia	4	31	1	1,032	[1] 28	1,004	.....	2.7	97.3	.....	2,316,288	[1] 41,028	2,275,260	.....	1.8	98.2	.....
Wisconsin	19	18	13	414	70	284	60	16.9	68.6	14.5	1,240,606	207,778	841,677	191,151	16.7	67.8	15.4
Wyoming	4	4	2	46	[1] 25	21	.....	54.3	45.7	.....	194,851	[1] 82,892	111,959	.....	42.6	57.4	.....
All other states	1	7	2	130	.....	130	[2] 0	.....	93.5	6.5	311,361	.....	295,881	[2] 15,480	.....	95.0	5.0

[1] Includes the group "All others." [2] Includes the group "Individuals." [3] Includes the groups "Individuals" and "All others."

TABLE 10.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919 AND 1914.

POWER.	Number of engines or motors.		Horsepower.				POWER.	Number of engines or motors.		Horsepower.			
			Amount.		Per cent distribution.					Amount.		Per cent distribution.	
	1919	1914	1919	1914	1919	1914		1919	1914	1919	1914	1919	1914
Primary power, total	6,587	6,583	405,746	442,813	100.0	100.0	Rented	3,408	1,912	106,435	65,028	26.2	14.7
Owned	3,179	4,671	299,311	377,785	73.8	85.3	Electric	3,408	1,912	105,846	64,695	26.1	14.6
Steam	2,769	4,064	281,815	357,285	69.5	80.7	Other	.....	.....	589	333	0.1	0.1
Engines	2,727	4,064	277,574	357,285	68.4	80.7	Electric	4,838	3,090	133,354	88,406	100.0	100.0
Turbines	42	.....	4,241	.....	1.0	.....	Rented	3,408	1,912	105,846	64,695	79.4	73.2
Internal-combustion engines	409	591	17,456	20,145	4.3	4.5	Generated by establishments reporting	1,430	1,178	27,508	23,711	20.6	26.8
Water wheels, turbines, and motors	1	16	40	355	(1)	0.1							

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

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

STATE.	COAL. Anthracite [1] (ton, 2,240 pounds).	COAL. Bituminous (ton, 2,000 pounds).	Coke (ton 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
United States:						
1919	128,252	6,894,745	34,510	1,290,682	19,250	10,009,521
1914	246,138	8,566,947	65,375	1,849,583	(2)	15,472,771
Alabama		125,617	1,321	10	89	
Arizona		2,290		3,531		
Arkansas		2,398		1,918	2	953,681
California	100	5,432	10	411,306	192	407,969
Colorado	431	83,076	237	22	1	
Connecticut	1,684	13,077	100	240	533	
Delaware	650	4,956			1	
Florida		20		30	69	
Georgia	300	141,231	4,422	166	146	
Idaho		5,889				
Illinois	4,949	745,465	2,069	153,405	3,171	
Indiana		506,237	1,002	6,036	583	7,600
Iowa		336,750	180	9,100	3,429	
Kansas		88,392		10,474		1,154,527
Kentucky		234,710	416	300	670	308,261
Louisiana		909	168	51,930	30	65,228
Maine	20	5,516			90	
Maryland	178	88,526		156	13	
Massachusetts	4,956	16,614	78			444
Michigan	94	82,933	30	114,122	183	
Minnesota	635	67,212	300	65	253	
Mississippi	250	26,426		168		
Missouri	885	395,175	616	119,624	121	3,055
Montana		14,931		12	76	
Nebraska	130	27,970	380	115	351	
New Hampshire	812	3,937		1	26	
New Jersey	20,258	199,878	3,700	8,397	262	12
New York	48,058	117,713	1,488	4,086	4,238	14,656
North Carolina	1,200	77,833	1,205	300	16	
North Dakota		15,165				
Ohio	2,453	1,493,487	947	7,742	2,064	886,210
Oklahoma		27,587		11,138		1,964,706
Oregon		3,016		942	5	
Pennsylvania	36,426	1,429,426	1,164	378	1,515	2,367,663
South Carolina		20,186			629	
South Dakota		2,789			2	
Tennessee		131,686	2,872		22	
Texas	2,403	30,725	6,944	345,670	146	925,536
Utah		28,573				
Virginia	70	109,420		85	174	
Washington		54,269	1,370	1,150	39	
West Virginia	254	86,159		6	2	929,973
Wisconsin	1,050	25,768	2,181	8,800	105	
Wyoming		1,678	1,235	7,133		20,000
All other states	6	4,698	75	12,124	2	

[1] Includes some semianthracite.

[2] Included in figures for fuel oils.

SPECIAL STATISTICS

Products.—Table 12 presents comparative statistics for products, by kind and states, for 1919 and 1914. The total value of products here given, from the reports of the Geological Survey, is not strictly comparable with the value of products for the industry as reported by the census in other tables. The latter includes all products of the establishments irrespective of their character, and the former includes production by establishments engaged primarily in other lines of manufacture.

TABLE 12.—PRODUCTS: 1919 AND 1914.

[Reported by the Geological Survey.]

	1919 Quantity.	1919 Value.	1914 Quantity.	1914 Value.
Total value		$208,403,514		$129,582,848
Alabama		3,077,766		1,557,481
Arizona		188,034		156,167
Arkansas		1,229,296		432,586
California		4,922,739		4,116,358
Colorado		2,680,277		1,082,685
Connecticut and Rhode Island		2,350,329		1,229,037
Delaware and District of Columbia		284,429		303,584
Florida		185,135		240,094
Georgia		3,772,632		2,242,073
Idaho and Nevada		310,192		110,864
Illinois		16,473,770		12,538,374
Indiana		10,441,902		6,503,207
Iowa		8,107,601		6,368,995
Kansas		3,426,002		1,905,961
Kentucky		5,501,070		2,286,980
Louisiana		759,386		422,062
Maine		612,562		914,808
Maryland		2,247,092		1,640,017
Massachusetts		1,940,825		1,462,453
Michigan		3,699,929		2,434,872
Minnesota		2,287,906		1,944,886
Mississippi		934,827		515,797
Missouri		11,016,333		6,074,340
Montana		462,875		440,519
Nebraska		1,038,668		640,955
New Hampshire and Vermont		712,551		473,913
New Jersey		10,228,430		8,353,296
New Mexico		234,218		205,914
New York		8,835,231		6,923,141
North Carolina		3,238,249		1,447,994
North Dakota		$303,057		$266,046
Ohio		33,771,197		21,815,392
Oklahoma		2,190,129		786,314
Oregon		378,963		560,271
Pennsylvania		42,443,802		20,100,495
South Carolina		1,058,196		557,977
South Dakota		73,571		57,711
Tennessee		2,882,740		1,449,120
Texas		4,357,073		2,220,240
Utah		1,143,134		676,142
Virginia		2,724,629		1,472,348
Washington		1,766,362		1,809,491
West Virginia		2,711,098		1,830,947
Wisconsin		1,203,757		943,909
Wyoming		194,350		64,942
	Thousands.		*Thousands.*	
Common brick	4,751,881	63,584,748	7,145,809	43,763,554
Pennsylvania	450,144	6,780,052	688,178	4,641,269
New York	479,505	6,374,979	908,868	4,666,037
Illinois	567,714	5,675,936	941,343	4,898,698
Ohio	293,757	4,083,877	436,117	2,862,109
North Carolina	187,976	2,822,813	183,648	1,216,180
Michigan	200,352	2,734,503	269,154	1,633,216
New Jersey	213,250	2,489,876	349,434	1,944,806
Virginia	155,526	2,408,165	187,102	1,229,356
Connecticut and Rhode Island	143,280	2,160,254	171,289	1,140,842
Georgia	165,572	2,158,627	214,979	1,040,557
Texas	155,026	2,104,600	182,695	1,180,586
Tennessee	111,776	1,670,759	137,406	843,363
California	126,892	1,545,558	221,243	1,356,885
Maryland	88,643	1,306,318	146,860	1,180,401
Massachusetts	84,003	1,297,637	139,632	1,023,070

TABLE 12.—PRODUCTS: 1919 AND 1914—Continued.

[Reported by the Geological Survey.]

	1919		1914	
	Quantity.	Value.	Quantity.	Value.
Common brick—Con.	*Thousands.*		*Thousands.*	
Indiana	102,817	$1,242,629	180,701	$1,061,935
Oklahoma	99,697	1,232,791	74,301	374,774
Alabama	86,465	1,183,917	110,731	638,066
Missouri	82,010	1,159,198	169,029	1,157,852
Arkansas	64,465	952,843	58,921	378,395
Wisconsin	71,904	947,124	115,056	799,109
Iowa	66,032	941,489	143,534	1,067,746
South Carolina	67,331	935,482	89,148	505,839
Mississippi	57,115	880,014	72,978	460,311
Nebraska	62,194	727,278	81,601	519,991
Colorado	55,357	723,527	33,717	211,037
Louisiana	50,547	715,779	63,768	387,517
Kansas	62,189	700,800	106,930	486,854
West Virginia	46,079	704,954	68,022	450,242
Kentucky	63,215	698,114	90,124	594,514
Minnesota	56,010	655,024	132,688	883,791
Washington	44,436	627,015	51,657	351,565
New Hampshire and Vermont	33,959	583,636	55,206	443,913
Utah	20,270	411,096	33,493	270,564
Maine	19,536	322,546	39,961	311,924
Delaware and District of Columbia	13,006	225,346	32,501	259,079
Oregon	13,435	192,981	27,433	210,298
Wyoming	10,581	189,985	4,733	50,656
Idaho and Nevada	14,052	186,522	12,638	101,410
Florida	16,067	185,135	41,901	230,377
Arizona	11,744	174,234	15,904	139,324
Montana	13,302	170,959	26,732	270,738
New Mexico	13,059	149,006	11,148	94,570
North Dakota	7,672	85,703	16,857	140,784
South Dakota	4,419	65,667	6,178	52,404
Vitrified brick or block	489,242	11,615,144	931,324	12,500,866
For paving	392,526	9,371,763	931,324	12,500,866
Ohio	104,972	2,423,685	293,381	3,682,230
Pennsylvania	62,899	1,490,893	151,200	2,052,676
Illinois	64,184	1,446,240	157,176	2,086,344
Kansas	26,431	714,164	50,707	594,229
West Virginia	29,094	712,442	67,750	899,215
Indiana	21,700	585,922	42,937	576,892
New York	9,365	252,948	31,240	515,672
Oklahoma	9,069	209,333	9,912	127,792
Colorado	3,405	59,455	(1)	(1)
California	524	12,871	1,800	39,705
Other states	60,883	1,463,805	125,221	1,926,111
Other purposes	96,716	2,243,381	(2)	(2)
Ohio	20,519	712,631	(2)	(2)
Illinois	24,060	417,995	(2)	(2)
Pennsylvania	3,305	185,159	(2)	(2)
New York	8,072	167,217	(2)	(2)
Oklahoma	5,148	98,995	(2)	(2)
Indiana	5,285	97,394	(2)	(2)
Kansas	6,530	94,670	(2)	(2)
Other states	23,799	469,320	(2)	(2)
Face brick	791,068	16,033,059	810,395	9,289,623
Pennsylvania	190,309	4,012,728	219,923	2,402,361
Ohio	148,747	2,937,282	188,074	1,944,486
Illinois	104,090	1,862,407	46,995	506,984
Indiana	67,817	1,234,009	80,349	799,520
Missouri	32,278	762,470	27,692	411,193
Texas	25,767	659,935	18,450	249,611
New Jersey	24,611	605,764	23,640	377,779
Kansas	30,429	531,208	31,079	271,104
Iowa	20,603	449,491	11,183	148,394
Colorado	16,011	288,669	10,642	133,068
Tennessee	11,533	244,374	18,594	190,893
Georgia	11,517	208,095	7,475	77,721
California	7,688	191,162	10,759	226,268
Utah	7,700	166,451	14,742	189,131
Oklahoma	8,114	145,545	2,729	25,641
Wisconsin	6,447	104,444	8,388	78,766
Washington	3,528	91,947	5,319	109,197
West Virginia	4,207	86,586	2,354	37,114
Idaho and Nevada	2,650	67,068	.....	.....
New York	2,709	48,457	5,810	59,039
Other states	64,133	1,334,877	76,198	1,051,353
Fancy or ornamental brick—Colorado, Ohio, Connecticut, Virginia, and Kansas	2,198	77,879	.....	1,190,485
Enameled brick	14,166	846,676	.....	(2)
California	1,254	89,052	.....	.....
Other states	12,912	757,624	.....	.....

[1] Included in "Other states."

	1919		1914	
	Quantity.	Value.	Quantity.	Value.
Draintile	*Tons.* 1,241,168	$10,945,943	*Tons.*	$8,522,039
Iowa	335,587	3,127,878	.....	3,180,836
Ohio	246,158	2,042,452	.....	1,589,565
Indiana	249,360	1,885,218	.....	1,332,002
Illinois	154,194	1,203,586	.....	1,041,927
Michigan	68,967	737,124	.....	421,941
Minnesota	32,114	347,082	.....	143,194
Utah	10,775	179,320	.....	25,911
Wisconsin	17,527	143,899	.....	60,924
Tennessee	11,767	128,961	.....	48,551
New York	11,269	113,859	.....	66,217
Kentucky	17,265	108,854	.....	51,645
Missouri	10,218	90,163	.....	143,245
Colorado	8,669	90,000	.....	53,971
California	6,053	76,480	.....	30,284
Washington	7,291	57,509	.....	48,750
Oregon	4,119	41,527	.....	68,115
New Jersey	1,703	15,108	.....	31,043
Delaware and District of Columbia	1,074	9,509	.....	.....
Pennsylvania	1,005	8,005	.....	14,730
West Virginia	370	3,587	.....	3,733
Other states	45,683	536,322	.....	165,455
Sewer pipe	1,155,131	16,754,832	.....	14,014,767
Ohio	481,219	6,198,589	.....	4,691,719
Missouri	142,038	2,086,278	.....	1,236,236
Pennsylvania	115,152	1,296,815	.....	940,384
Georgia	62,372	927,467	.....	647,733
Indiana	69,138	918,845	.....	586,683
Iowa	43,698	902,008	.....	558,751
Illinois	47,833	824,002	.....	743,986
California	33,106	671,851	.....	959,193
Texas	27,796	584,774	.....	(1)
Washington	18,823	430,198	.....	462,898
New York	2,900	58,000	.....	(1)
Delaware and District of Columbia	(1)	(1)	.....	.....
Other states	111,056	1,856,005	.....	3,187,184
Architectural terra cotta	.....	3,988,182	.....	6,087,652
New Jersey	.....	1,104,715	.....	1,620,791
New York	.....	629,213	.....	889,468
Missouri	.....	391,032	.....	478,006
California	.....	356,474	.....	535,735
Pennsylvania	.....	255,915	.....	362,348
Washington	.....	118,274	.....	220,788
Colorado	.....	80,648	.....	(1)
Indiana	.....	41,320	.....	(1)
Other states	.....	1,010,591	.....	1,980,516
Hollow building tile or block	2,329,217	17,964,573	.....	8,385,337
Ohio	664,744	4,755,610	.....	2,200,544
Iowa	294,335	2,475,291	.....	1,083,397
Illinois	267,608	1,820,325	.....	567,266
New Jersey	173,933	1,623,628	.....	1,599,295
Indiana	199,922	1,555,859	.....	823,462
Pennsylvania	175,780	1,247,311	.....	494,175
Minnesota	70,306	527,241	.....	123,911
Kansas	60,873	501,068	.....	88,427
California	54,166	444,299	.....	223,071
Texas	45,680	438,601	.....	145,830
Missouri	44,869	361,555	.....	168,053
Alabama	31,706	293,111	.....	(1)
Nebraska	38,025	275,796	.....	67,586
New York	20,856	162,425	.....	161,725
Washington	15,114	136,609	.....	127,371
Montana	18,457	113,063	.....	(1)
Oregon	11,645	107,750	.....	38,353
Colorado	22,586	100,641	.....	(1)
West Virginia	5,485	36,135	.....	(1)
Tennessee	2,641	27,795	.....	(1)
Other states	110,486	960,460	.....	472,871
Tile (not drain)	*Sq. ft.*	8,137,452	.....	5,705,583
Roofing	9,414,800	1,283,901	.....	.....
Kansas	2,063,600	315,593	.....	.....
California	706,100	154,035	.....	.....
Other states	6,645,100	814,273	.....	.....

[1] Not reported separately; included above.

TABLE 12.—PRODUCTS: 1919 AND 1914—Continued.

[Reported by the Geological Survey.]

	1919		1914	
	Quantity.	Value.	Quantity.	Value.
Tile (not drain)—Con.	*Sq. ft.*		*Sq. ft.*	
Floor	7,790,967	$1,535,287		
Ohio	2,298,344	570,627		
New Jersey	1,469,765	310,370		
Indiana	982,655	215,582		
California	187,605	53,215		
Other states	2,852,598	385,493		
Ceramic mosaic	7,471,767	1,824,372		
Ohio	2,258,018	565,220		
New Jersey	2,224,840	542,538		
Indiana	968,350	242,087		
California	389,918	95,649		
Other states	1,630,641	378,878		
Faience	1,550,121	881,241		
Ohio	729,717	461,048		
New Jersey	321,102	174,338		
California	76,717	48,849		
Indiana	62,000	32,240		
Other states	360,585	164,766		
	Tons.			
Wall	7,495,618	2,012,651		
Ohio	2,450,396	833,013		
New Jersey	1,988,266	652,205		
Indiana	1,327,476	500,815		
California	266,630	139,480		
Other states	1,462,850	487,138		
Stove lining		683,844		$520,585
Massachusetts		208,979		159,924
Pennsylvania		165,530		129,419
Maryland		35,925		21,393
Missouri		13,774		(1)
Washington		3,472		
Other states		256,164		209,849
	Thousands.		*Thousands.*	
Fire brick	963,439	38,015,792	816,784	16,427,547
Pennsylvania	394,154	16,236,155	298,183	5,774,677
Missouri	126,574	5,121,077	76,177	1,554,431
Ohio	154,922	4,958,219	102,735	1,833,740
Kentucky	100,165	3,841,458	58,780	1,075,158
New Jersey	28,716	2,018,624	34,545	897,442
New York	10,595	782,009	7,797	321,048
California	19,654	743,117	13,560	358,526
Illinois	19,269	732,114	15,416	274,106
Maryland	15,256	671,532	12,448	243,043
West Virginia	31,861	624,080	17,796	146,668
Colorado	14,908	483,517	10,606	209,368
Alabama	10,162	373,836	8,721	167,021
Texas	7,009	199,820	4,860	82,838
Indiana	6,318	194,046	3,723	93,900
Fire brick—Con.	*Thousands.*		*Thousands.*	
Washington	3,889	$153,170	1,054	$29,869
Massachusetts	1,585	95,898	2,084	74,736
Georgia	4,030	91,411		(1)
Michigan	1,242	89,147		(1)
Tennessee	2,348	64,029	1,087	19,717
Montana	938	46,412	1,226	50,517
New Mexico	1,056	34,931		
Other states	8,788	461,190	145,986	3,220,742
Silica brick	211,420	10,914,898	(2)	(2)
Pennsylvania	160,058	7,842,316	(2)	(2)
Washington	443	30,172	(2)	(2)
Other states	50,919	3,042,410	(2)	(2)
All other brick and tile products		8,840,492		3,165,810
Pennsylvania		2,396,609		786,675
Ohio		2,299,054		552,816
Indiana		821,339		426,220
Oklahoma		503,460		258,107
Illinois		493,721		274,359
Missouri		274,975		86,845
California		289,179		60,482
New Jersey		245,171		244,601
Texas		241,922		45,008
West Virginia		214,679		24,848
Kansas		210,021		122,954
Arkansas		152,577		
Colorado		141,946		113,252
Minnesota		92,053		
New York		86,088		
Michigan		75,150		35,000
Maine		47,481		924
Tennessee		43,656		
Kentucky		4,260		11,615
Washington		36,055		27,872
Iowa		31,975		40,146
Maryland		29,165		
Georgia		27,319		
Louisiana		27,257		17,596
Massachusetts		20,259		
Other states		34,521		36,490

[1] Included in "Other states."

[2] Not reported separately.

GENERAL TABLES.

Table 13 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 and 1914. Table 14 is a detailed statement, by states, for the census of 1919.

TABLE 13.—COMPARATIVE SUMMARY, BY STATES: 1919 AND 1914.

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	2,414	76,915	405,746	$78,256	$67,488	$208,423
	1914	3,239	100,182	442,813	54,907	42,723	135,921
Alabama	1919	42	1,350	6,016	974	1,034	3,088
	1914	51	1,599	6,373	579	560	1,622
Arizona	1919	13	99	178	102	56	188
	1914	12	96	300	71	39	176
Arkansas	1919	21	354	2,052	369	308	1,074
	1914	26	395	2,323	161	126	461
California	1919	60	1,747	11,557	1,884	1,824	5,211
	1914	72	2,387	12,453	1,704	1,355	4,319
Colorado	1919	43	812	4,595	864	774	2,505
	1914	41	561	3,559	376	396	1,127
Delaware	1919	11	85	661	98	73	223
	1914	13	159	767	74	47	173
Florida	1919	11	156	805	71	54	181
	1914	14	222	1,320	84	94	288
Georgia	1919	47	1,617	9,573	1,194	1,277	3,734
	1914	53	1,875	9,741	739	828	2,394
Idaho	1919	12	109	764	132	72	303
	1914	10	73	763	44	22	95
Illinois	1919	144	5,627	40,098	6,502	4,830	17,564
	1914	219	7,151	42,397	5,219	3,601	12,434
Indiana	1919	151	3,648	20,883	3,519	3,437	9,881
	1914	218	4,089	28,643	2,647	2,316	7,218
Iowa	1919	113	2,452	18,335	2,994	2,639	8,127
	1914	158	3,163	20,081	2,169	2,021	6,400
Kansas	1919	29	1,136	8,472	1,222	1,199	3,407
	1914	29	1,216	7,239	723	635	1,953
Kentucky	1919	47	2,349	7,807	2,002	2,004	5,686
	1914	69	2,234	7,297	860	730	2,203
Louisiana	1919	18	434	1,881	337	207	741
	1914	31	583	2,380	171	114	396
Maine	1919	19	254	1,186	278	259	704
	1914	37	467	1,277	308	316	741
Maryland	1919	30	1,207	6,147	1,009	1,113	3,207
	1914	41	1,721	6,258	720	498	1,645
Massachusetts	1919	35	739	3,026	816	524	1,818
	1914	46	1,124	3,378	680	417	1,459
Michigan	1919	48	852	6,047	1,181	818	3,330
	1914	84	1,719	9,794	960	836	2,474
Minnesota	1919	34	799	5,224	834	809	2,293
	1914	61	1,215	7,664	764	749	2,152
Mississippi	1919	28	472	1,702	365	292	925
	1914	38	551	2,435	198	188	513
Missouri	1919	65	4,469	15,132	4,486	3,918	11,456
	1914	90	5,188	14,747	2,771	1,995	6,509
Montana	1919	14	145	2,139	$194	$200	$505
	1914	17	191	1,488	183	150	474
Nebraska	1919	29	402	2,631	479	240	1,065
	1914	44	489	3,577	303	169	644
New Hampshire	1919	9	169	456	208	105	465
	1914	21	345	641	192	114	417
New Jersey	1919	67	3,544	17,523	3,859	2,778	10,127
	1914	90	7,786	19,103	3,984	2,423	8,826
New York	1919	118	3,246	20,228	3,503	2,240	8,813
	1914	171	5,776	26,467	3,009	1,774	6,267
North Carolina	1919	95	1,338	6,503	1,045	1,006	3,212
	1914	127	1,601	7,959	502	493	1,507
North Dakota	1919	5	140	901	157	81	309
	1914	9	171	1,728	101	59	270
Ohio	1919	341	12,060	63,763	12,931	9,961	32,173
	1914	450	16,238	67,161	9,798	7,208	23,376
Oklahoma	1919	22	628	4,452	581	643	1,679
	1914	23	402	3,231	217	129	496
Oregon	1919	23	152	1,166	165	92	386
	1914	42	382	2,894	201	165	521
Pennsylvania	1919	303	15,897	69,211	16,155	16,512	43,842
	1914	356	17,412	69,310	8,869	8,032	22,731
South Carolina	1919	23	566	2,107	387	457	1,156
	1914	31	696	2,950	200	238	579
South Dakota	1919	3	23	244	23	21	64
	1914	3	26	265	15	16	38
Tennessee	1919	46	1,265	4,377	983	882	2,783
	1914	72	1,640	4,892	704	505	1,638
Texas	1919	58	1,663	9,093	1,336	1,334	4,167
	1914	70	1,765	8,738	778	916	2,316
Utah	1919	21	440	1,467	416	244	1,144
	1914	27	438	2,646	280	123	625
Virginia	1919	45	1,331	3,967	1,085	850	2,738
	1914	64	1,663	5,852	614	513	1,493
Washington	1919	35	664	5,291	789	555	1,783
	1914	40	962	5,404	626	529	2,027
West Virginia	1919	36	1,032	8,649	1,053	785	2,316
	1914	40	1,451	7,245	1,088	563	1,977
Wisconsin	1919	50	414	3,807	397	390	1,241
	1914	72	828	3,821	417	301	1,114
Wyoming	1919	10	46	644	74	42	195
	1914	7	47	187	26	12	55
All other states	1919	40	974	4,986	1,113	549	2,605
	1914	50	1,485	6,056	778	408	1,778

TABLE 14.—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	2,414	86,503	1,649	4,350	2,446	1,143	76,915	Au 90,929	Fe 55,866	88,099	86,289	1,290	505	15	355,848,355
2	Alabama	42	1,493	29	67	23	15	1,359	Oc 1,427	Ap 1,296	1,489	1,474	6	9	.....	4,180,012
3	Arizona	13	113	12	2	.....	.....	99	Jy 149	Ja 35	128	128	.....	.....	.....	249,261
4	Arkansas	21	413	15	29	5	10	354	Au 476	Ja 167	444	441	.....	3	.....	1,027,054
5	California	60	1,994	25	112	72	38	1,747	De 2,124	Ja 1,218	2,287	2,232	41	14	.....	9,542,916
6	Colorado	43	929	29	55	21	12	812	Au 1,066	Ja 465	931	924	6	.....	1	2,919,940
7	Connecticut	30	945	19	61	22	8	835	Jy 1,149	Ja 393	825	820	2	3	.....	3,172,974
8	Delaware	11	101	9	6	1	.....	85	Je 123	Ja 40	124	124	.....	.....	.....	395,700
9	Florida	11	182	17	9	.....	.....	156	Oc [3] 169	Ja 139	155	154	.....	1	.....	242,601
10	Georgia	47	1,803	22	103	42	19	1,617	Oc 1,872	Ja 1,217	1,855	1,839	9	7	.....	5,143,634
11	Idaho	12	130	7	9	3	2	109	Je 184	Fe 43	116	116	.....	.....	.....	341,444
12	Illinois	144	6,471	110	399	237	98	5,627	Oc 7,443	Ja 3,239	6,932	6,917	8	7	.....	33,419,279
13	Indiana	151	4,132	111	211	112	50	3,648	Se 4,495	Ja 2,448	4,286	4,096	179	11	.....	15,992,617
14	Iowa	113	2,854	97	167	106	32	2,452	Au 3,199	Ja 1,104	2,768	2,758	3	7	.....	13,959,969
15	Kansas	29	1,267	8	60	43	20	1,136	Au 1,409	Ja 630	1,324	1,322	2	.....	.....	4,242,497
16	Kentucky	47	2,596	29	128	58	32	2,349	Se 2,747	Fe 1,981	2,389	2,321	48	20	.....	7,596,108
17	Louisiana	18	506	10	28	22	12	434	Se 549	Fe 209	555	543	.....	12	.....	1,031,143
18	Maine	19	300	12	20	9	5	254	Au 409	Ja 108	290	290	.....	.....	.....	1,188,857
19	Maryland	30	1,341	12	75	29	18	1,207	Au 1,400	Ja 943	1,308	1,285	.....	23	.....	7,518,743
20	Massachusetts	35	830	18	45	19	9	739	Au 1,116	Mh 326	899	890	.....	9	.....	2,467,083
21	Michigan	48	972	43	48	14	15	852	Je 1,082	Ja 498	973	963	1	9	.....	4,359,383
22	Minnesota	34	929	27	54	32	17	799	Au 1,150	Ja 348	1,041	1,018	.....	23	.....	4,800,734
23	Mississippi	28	547	37	38	1	4	472	Au 612	Ja 335	606	588	.....	18	.....	1,230,183
24	Missouri	65	5,017	29	186	248	85	4,469	Oc 5,292	Ja 3,452	4,947	4,934	9	4	.....	19,777,479
25	Montana	14	180	9	16	9	1	145	Jy 261	Fe 68	155	154	1	.....	.....	989,367
26	Nebraska	29	487	39	34	9	3	402	Au 627	Ja 100	543	536	1	6	.....	1,576,553
27	New Hampshire	9	197	6	13	6	3	169	My 335	Ja 42	163	160	1	2	.....	361,688
28	New Jersey	67	3,963	25	198	130	66	3,544	Oc 4,429	Fe 2,190	4,358	4,075	266	9	8	18,720,986
29	New York	118	3,620	80	187	68	39	3,246	Jy 4,606	Fe 1,264	4,045	4,031	14	.....	.....	16,775,766
30	North Carolina	95	1,540	102	84	13	3	1,338	Au 1,799	Ja 752	1,718	1,670	.....	48	.....	2,431,556
31	North Dakota	5	152	3	6	1	2	140	Jy 208	Ja [3] 114	114	102	1	11	.....	217,551
32	Ohio	341	13,548	239	615	404	230	12,060	Se 13,817	Ja 9,433	13,230	12,672	497	61	.....	64,371,925
33	Oklahoma	22	705	7	38	23	9	628	Au 758	Ja 346	716	715	1	.....	.....	1,906,508
34	Oregon	23	187	22	11	1	1	152	Au 275	Ja 27	285	281	1	3	.....	1,034,650
35	Pennsylvania	303	17,438	144	738	467	192	15,897	Se 17,046	Mh 14,637	17,034	16,769	126	133	6	74,250,630
36	South Carolina	23	625	21	32	4	2	566	Se 733	Fe 402	589	581	1	7	.....	1,655,526
37	South Dakota	3	29	.....	4	2	.....	23	Je 39	Ja [3] 3	27	27	.....	.....	.....	127,000
38	Tennessee	46	1,424	39	64	41	15	1,265	Au 1,679	Fe 811	1,526	1,508	.....	18	.....	3,245,085
39	Texas	58	1,905	24	125	71	22	1,663	Au 2,059	Ja 1,079	1,900	1,891	7	2	.....	6,682,576
40	Utah	21	505	26	29	5	5	440	Au 594	Ja 261	474	466	1	7	.....	2,134,865
41	Virginia	45	1,471	38	72	19	11	1,331	Se 1,663	Ja 899	1,592	1,592	.....	.....	.....	2,580,290
42	Washington	35	771	20	59	19	9	664	Jy 837	Fe 386	821	815	1	5	.....	4,649,919
43	West Virginia	36	1,151	6	67	26	20	1,032	Jy 1,198	Ja [3] 788	1,164	1,107	56	1	.....	4,266,908
44	Wisconsin	50	512	54	32	6	6	414	Je 738	Ja 94	661	651	1	9	.....	1,804,890
45	Wyoming	10	60	8	4	2	.....	46	Je 77	Fe 5	105	103	.....	2	.....	227,096
46	All other states [4]	10	168	10	15	1	3	139	.....	.....	207	206	.....	1	.....	1,036,809

[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.				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.*								
10,989,977	4,850,930	78,250,085	528,613	425,078	4,808,971	33,084,160	34,403,953	208,422,920	140,934,807	405,746	277,574	4,241	17,456	40	106,435	27,508	1
153,910	49,431	973,824	8,500	4,022	37,181	450,078	583,769	3,088,485	2,054,638	6,016	4,318	60	17	.....	1,621	222	2
1,200	.....	101,530	130	450	1,093	9,795	45,848	188,034	132,391	178	.....	.....	.....	.....	178	.....	3
78,185	16,154	360,039	.....	300	18,625	124,541	183,894	1,073,969	765,534	2,052	1,927	.....	85	.....	40	76	4
316,701	160,714	1,884,457	10,045	8,206	105,892	895,402	929,049	5,211,390	3,386,939	11,557	3,550	150	92	.....	7,765	10	5
112,668	34,635	863,878	47,790	5,992	55,243	388,856	384,937	2,504,658	1,730,865	4,595	3,180	.....	10	.....	1,405	111	6
160,158	31,538	989,102	5,164	8,029	43,618	178,514	284,979	2,294,001	1,830,508	3,814	1,570	.....	82	.....	2,162	.....	7
9,480	260	97,870	.....	1,520	1,524	34,848	38,004	222,740	149,888	661	536	.....	.....	.....	125	.....	8
9,677	.....	71,304	.....	1,270	1,648	11,971	42,046	181,430	127,413	805	617	120	68	.....	.....	.....	9
289,669	84,924	1,193,593	1,200	1,479	99,506	480,563	796,506	3,733,823	2,456,754	9,573	5,202	.....	51	.....	4,320	30	10
23,555	4,846	132,221	8,976	1,471	1,768	23,064	47,896	302,987	231,457	764	60	.....	.....	.....	704	.....	11
1,057,112	459,003	6,502,174	17,604	20,755	337,817	1,905,904	2,923,932	17,564,017	12,734,181	40,098	28,913	363	332	.....	10,490	4,745	12
417,252	235,505	3,519,367	48,448	8,569	244,236	1,805,657	1,631,311	9,880,579	6,443,611	20,883	16,225	.....	207	.....	4,451	994	13
365,455	184,193	2,994,261	25,489	21,766	97,465	945,135	1,694,077	8,127,157	5,487,945	18,335	10,823	280	451	.....	6,781	586	14
163,382	81,310	1,222,475	8,144	2,480	70,237	410,879	787,948	3,407,019	2,208,192	8,472	4,147	150	2,481	.....	1,694	150	15
333,909	144,295	2,002,074	200	600	169,776	1,155,238	848,809	5,686,473	3,682,426	7,807	6,991	260	72	.....	484	2,513	16
61,485	16,287	336,825	.....	9,830	29,539	39,245	167,475	740,610	533,890	1,881	1,411	100	83	.....	287	20	17
42,205	15,189	277,655	1,200	642	16,497	134,591	124,235	704,484	445,658	1,186	675	.....	38	.....	473	686	18
171,034	45,789	1,099,219	329	2,011	55,272	686,971	425,566	3,207,465	2,094,928	6,147	4,547	.....	.....	.....	1,600	10	19
105,330	40,079	815,617	54,550	21,741	35,972	234,461	290,027	1,817,512	1,293,024	3,026	1,492	.....	69	.....	1,465	15	20
159,029	36,256	1,180,743	9,010	3,619	87,031	189,406	628,508	3,339,381	2,521,467	6,047	5,884	.....	90	.....	73	7	21
124,810	55,333	834,062	73	8,000	51,682	306,206	503,112	2,293,396	1,484,078	5,224	3,270	370	67	.....	1,517	545	22
55,745	14,418	364,947	.....	160	10,055	116,570	175,222	925,222	633,430	1,702	1,680	.....	22	.....	.....	.....	23
579,731	440,051	4,485,883	1,125	12,470	269,320	2,211,031	1,707,005	11,455,779	7,537,743	15,132	12,027	.....	210	.....	2,895	2,288	24
36,064	15,339	194,450	303	1,135	13,212	115,608	84,314	505,053	305,131	2,139	360	.....	.....	.....	1,779	.....	25
90,603	16,795	479,068	6,022	4,425	22,698	78,579	161,892	1,065,264	824,793	2,631	2,031	80	135	.....	385	65	26
34,290	13,481	207,631	.....	4,609	4,300	10,850	85,554	465,204	359,800	456	315	.....	41	.....	100	.....	27
533,370	282,958	3,859,313	.....	49,013	269,447	1,631,337	1,146,904	10,127,176	7,348,935	17,523	12,897	80	458	.....	4,088	2,179	28
452,441	121,030	3,503,190	44,721	64,491	173,411	1,194,799	1,044,664	8,813,281	6,573,818	20,228	15,695	.....	910	.....	3,623	1,125	29
185,596	11,884	1,044,585	4,000	5,614	91,894	287,129	718,495	3,211,892	2,206,268	6,503	4,871	125	150	.....	1,357	.....	30
12,650	5,617	156,566	2,133	10,675	6,448	21,513	59,707	308,550	227,330	901	600	300	1	.....	.....	.....	31
1,583,812	804,322	12,931,241	97,632	38,430	863,983	4,577,945	5,382,726	32,172,576	22,211,905	63,763	49,023	390	4,003	.....	10,347	5,818	32
109,260	37,936	580,875	.....	365	29,189	235,176	408,264	1,679,129	1,035,686	4,452	3,460	.....	503	.....	489	1,005	33
23,689	2,969	105,424	1,983	180	9,242	26,581	65,139	385,581	203,861	1,166	556	.....	10	.....	600	20	34
2,052,499	1,019,954	16,155,084	69,950	70,986	1,040,786	10,164,224	6,347,407	43,842,120	27,330,489	69,211	37,576	1,395	5,673	.....	24,567	2,705	35
77,453	5,690	386,726	100	3,200	16,382	174,415	282,717	1,155,681	698,549	2,107	1,660	.....	21	.....	426	.....	36
5,740	720	22,627	.....	.....	444	1,500	19,427	63,571	42,644	244	215	.....	4	.....	25	.....	37
125,643	67,089	983,038	12,164	1,215	88,991	365,867	516,085	2,782,669	1,900,717	4,377	3,700	13	29	.....	635	143	38
255,397	121,330	1,335,884	18,190	3,139	173,866	428,738	905,316	4,166,571	2,832,517	9,093	8,001	5	206	.....	881	250	39
75,254	10,949	415,586	422	2,673	17,614	110,743	133,501	1,144,021	809,777	1,467	45	.....	.....	.....	1,422	215	40
166,940	35,691	1,085,271	2,650	1,985	47,230	268,381	582,106	2,738,298	1,887,811	3,967	3,551	.....	60	.....	356	40	41
133,486	34,805	789,328	1,250	7,450	39,066	185,384	369,834	1,782,566	1,227,348	5,291	3,384	.....	10	.....	1,897	390	42
144,123	67,040	1,052,811	.....	967	31,573	307,777	477,600	2,316,288	1,530,911	8,649	6,984	.....	632	.....	1,033	460	43
58,325	17,706	396,972	19,026	7,208	17,428	125,218	264,436	1,240,606	850,952	3,807	2,510	.....	79	40	1,178	85	44
8,600	3,365	74,468	.....	1,236	2,119	3,133	39,278	194,851	152,440	644	160	.....	2	.....	482	.....	45
33,060	4,020	123,818	.....	700	8,051	20,737	64,459	311,361	226,165	1,172	935	.....	2	.....	235	.....	46

[3] Same number reported for one or more other months.
[4] All other states embrace: District of Columbia, 2 establishments; Nevada, 1; New Mexico, 6; and Vermont, 1.

POTTERY.

GENERAL STATISTICS.

General character of the industry.—This branch of the clay products industries embraces the establishments engaged primarily in the manufacture of pottery, comprising stoneware, earthenware, porcelain ware, china of various kinds, sanitary earthenware, and allied products. The general statistics for the industry in 1919 and 1914 have been given in Table 2 in comparison with those for the brick and tile branch of the clay products industries.

Principal states, ranked by value of products.—Table 15 shows the number of 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 16 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 26. Figures for 1909 are not given in Table 16 on account of a change in the basis of segregation of the pottery and of the brick and tile establishments, though given in Table 4 for the brick and tile industry.

Wage earners, by months.—The statistics for wage earners, Table 17, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. The wage earners include a considerable proportion of females, namely, 25.4 per cent in 1919 for the industry as a whole. In the leading states, those employing more than 500 wage earners, the percentage of female wage earners employed ranged from 13.1 per cent in Indiana to 41.2 per cent in Michigan.

Prevailing hours of labor.—The figures given in Table 18 show that the movement toward shorter hours of labor per week is not as marked as in the other branch of the clay products industries. In 1919 the number of wage earners employed in establishments where the prevailing hours of labor per week were 60 and over constitute 11.2 per cent of the total number, compared with 10 per cent in 1914; and 25.3 per cent of the total number in 1919 were employed in establishments where the prevailing hours of labor were 48 per week or less as compared with 23.2 per cent in 1914.

Size of establishments, by average number of wage earners.—The pottery industry, Table 19, is one of larger units than the brick and tile branch, the average number of wage earners per establishment being 82 in 1919 and 76 in 1914. In 1919 the establishments employing over 250 wage earners reported 33 per cent of the total number, and in 1914, 42 per cent.

Size of establishments, by value of products.—The classification by value of products, as shown in Table 20, necessarily reflects the general increase in value. The average value of products per establishment increased from $106,000 in 1914 to $220,000 in 1919, but this increase is essentially due to high prices, and hence the changes from lower to higher groups.

Character of ownership.—Table 21 presents the statistics for establishments classified according to form of ownership. The corporation group employed 93.7 per cent of the wage earners in 1919 and 94.4 per cent in 1914, and reported 94.8 per cent of the products for both 1919 and 1914.

Number and horsepower of types of prime movers.—Table 22 presents the power statistics for the industry. Electric power is employed quite extensively, either purchased or generated at the plants. Of the total primary power, 48.6 per cent was utilized as electric power in 1919, this including electric motor equipment operated with purchased current, specified as rented, and secondary or that generated by the establishment. In 1914 the total ratio of electric power to primary power, was 28.4 per cent. and in 1909, 9.7 per cent.

Fuel consumed.—Table 23 presents the statistics for fuel, by kinds and by states. The figures for gas include both natural and manufactured gas.

TABLE 15.—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	340	27,934	100.0	....	$74,919	100.0	....	$54,125	100.0	...
Ohio	95	11,330	40.6	1	28,675	38.3	1	19,663	36.3	1
New Jersey	53	5,717	20.5	2	16,226	21.7	2	12,645	23.4	2
West Virginia	18	3,445	12.3	3	10,112	13.5	3	7,074	13.1	3
New York	14	1,858	6.7	5	4,726	6.3	4	3,644	6.7	4
Pennsylvania	22	1,868	6.7	4	4,565	6.1	5	3,212	5.9	5
Indiana	8	747	2.7	6	2,624	3.5	6	1,846	3.4	6
Michigan	6	708	2.5	7	2,113	2.8	7	1,571	2.9	7
Illinois	14	652	2.4	8	1,852	2.5	8	1,463	2.7	8
California	10	296	1.1	9	849	1.1	9	591	1.1	10
Maryland	4	246	0.9	10	497	0.7	11	350	0.7	11
Massachusetts	8	149	0.5	13	$368	0.5	12	$255	0.5	13
Kentucky	5	105	0.4	15	208	0.3	15	140	0.3	16
Colorado	5	95	0.3	16	200	0.3	16	166	0.3	15
Texas	10	40	0.2	17	99	0.1	17	72	0.1	17
Alabama	10	8	(1)	26	33	0.1	21	26	0.1	21
Washington	3	10	(1)	24	28	(1)	23	18	(1)	23
Mississippi	4	11	(1)	23	25	(1)	24	15	(1)	26
Georgia	15	8	(1)	27	22	(1)	25	17	(1)	24
North Carolina	10	7	(1)	29	15	(1)	29	12	(1)	29
South Carolina	3	5	(1)	31	13	(1)	31	8	(1)	32
All other states	23	620	2.2	....	1,669	2.2	....	1,337	2.5	...

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

TABLE 16.—PERSONS ENGAGED IN THE INDUSTRY: 1919 AND 1914.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	30,692	22,925	7,767	74.7	25.3
	1914	28,758	22,238	6,520	77.3	22.7
Proprietors and officials	1919	1,389	1,340	49	96.5	3.5
	1914	1,004	966	38	96.2	3.8
Proprietors and firm members	1919	183	172	11	94.0	6.0
	1914	212	205	7	96.7	3.3
Salaried officers of corporations	1919	400	387	13	96.8	3.2
	1914	294	281	13	95.6	4.4
Superintendents and managers	1919	806	781	25	96.9	3.1
	1914	498	480	18	96.4	3.6
Clerks and other subordinate salaried employees.	1919	1,369	748	621	54.6	45.4
	1914	1,049	695	354	66.3	33.7
Wage earners (average number)	1919	27,934	20,837	7,097	74.6	25.4
	1914	26,705	20,577	6,128	77.1	22.9
16 years of age and over	1919	27,584	20,608	6,976	74.7	25.3
	1914	26,424	20,411	6,013	77.2	22.8
Under 16 years of age	1919	350	229	121	65.4	34.6
	1914	281	166	115	59.1	40.9

TABLE 17.—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	27,934	26,431	**26,106**	26,267	26,638	26,909	27,294	28,023	28,689	28,830	29,638	30,041	**30,342**	86.0
Males	20,837	19,660	**19,441**	19,557	19,837	19,970	20,326	21,009	21,455	21,553	22,094	22,457	**22,685**	85.7
Females	7,097	6,771	**6,665**	6,710	6,801	6,939	6,968	7,014	7,234	7,277	7,544	7,584	**7,657**	93.6
1914	26,705	26,034	26,732	27,240	**27,301**	27,099	26,668	*25,565*	26,754	26,963	27,188	26,737	26,179	93.6
Alabama	8	*5*	*5*	8	8	8	10	9	9	9	9	9	7	50.0
California	296	306	307	297	284	267	*261*	286	296	303	309	313	323	80.8
Colorado	95	97	91	96	85	*82*	86	87	95	96	112	119	94	68.9
Georgia	8	*2*	5	5	5	4	4	4	8	9	16	20	14	10.0
Illinois	652	755	750	756	**774**	700	651	693	*459*	462	542	605	677	59.3
Indiana	747	*695*	706	714	727	726	747	755	795	796	796	699	**810**	87.3
Kentucky	105	100	*97*	109	105	104	108	104	112	111	104	102	104	86.6
Maryland	246	255	231	*228*	239	241	257	245	246	246	252	254	**258**	88.4
Massachusetts	149	139	142	140	*138*	139	150	150	155	155	161	162	157	85.2
Michigan	708	865	721	674	713	748	*648*	700	658	679	693	673	724	74.9
Mississippi	11	11	11	11	11	11	11	11	11	11	11	11	11	.....
New Jersey	5,717	5,196	4,973	*4,958*	4,988	5,190	5,431	5,722	6,124	6,214	6,446	6,598	**6,764**	73.3
New York	1,858	*1,671*	1,686	1,707	1,700	1,831	1,859	1,894	1,931	1,948	1,966	**2,016**	1,997	82.9
North Carolina	7	*5*	*5*	6	6	7	7	5	10	10	10	7	6	50.0
Ohio	11,330	*10,608*	10,728	10,926	11,074	11,163	11,171	11,301	11,597	11,596	11,894	**11,991**	11,929	89.2
Pennsylvania	1,868	1,760	*1,752*	1,758	1,819	1,784	1,836	1,897	1,950	1,933	1,998	1,975	1,954	87.7
South Carolina	5	*1*	*1*	4	6	6	7	7	7	7	7	6	*1*	14.3
Texas	40	*22*	27	32	34	37	53	62	54	46	28	38	47	35.5
Washington	10	2	2	2	*1*	*1*	14	15	17	17	15	18	16	5.6
West Virginia	3,445	*3,272*	3,285	3,316	3,313	3,313	3,395	3,421	3,448	3,511	3,604	3,714	**3,748**	87.3
States showing large proportion of females.														Per ct. av. is of state.
Illinois	108	105	101	99	100	*94*	101	112	97	97	127	127	**136**	16.0
Indiana	98	*97*	*97*	*97*	98	98	99	99	99	98	98	98	98	13.1
Michigan	292	400	308	280	301	312	253	273	250	*246*	312	250	319	41.2
New Jersey	1,155	1,065	1,006	1,011	*994*	1,063	1,108	1,142	1,223	1,221	1,302	1,351	**1,374**	20.2
New York	520	*492*	498	506	527	536	529	517	515	532	516	536	536	28.0
Ohio	3,309	*3,073*	3,112	3,176	3,211	3,269	3,277	3,261	3,382	3,418	3,498	3,528	3,498	29.2
Pennsylvania	469	428	425	*420*	454	455	463	482	525	500	496	489	491	25.1
West Virginia	956	*913*	937	944	932	931	960	936	935	966	1,001	1,009	1,008	27.8

TABLE 18.—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	27,934	2,320	752	3,996	10,840	6,320	2,385	1,321	.....
1914	26,705	(2)	(2)	6,207	6,846	8,860	2,142	2,582	68
Alabama	8	.....	.....	.....	1	1	.....	6	.....
California	296	61	.....	172	.....	63	.....	.....	.....
Colorado	95	.....	.....	69	.....	26	.....	.....	.....
Georgia	8	.....	.....	1	2	.....	4	1	.....
Illinois	652	.....	.....	20	78	487	25	42	.....
Indiana	747	.....	.....	214	348	100	85	.....	.....
Kentucky	105	.....	.....	.....	.....	.....	46	59	.....
Maryland	246	.....	.....	90	1	10	.....	145	.....
Massachusetts	149	16	.....	12	87	32	.....	2	.....
Michigan	708	.....	.....	3	477	228	.....	.....	.....
Mississippi	11	.....	.....	.....	10	.....	.....	1	.....
New Jersey	5,717	1,144	218	144	2,559	922	622	108	.....
New York	1,858	787	.....	321	455	.....	46	249	.....
North Carolina	7	.....	.....	.....	.....	.....	1	6	.....
Ohio	11,339	310	.....	2,895	4,352	2,733	1,045	4	.....
Pennsylvania	1,868	.....	.....	.....	733	919	214	2	.....
South Carolina	5	.....	.....	4	.....	.....	.....	1	.....
Texas	40	.....	.....	2	.....	5	.....	33	.....
Washington	10	.....	.....	10	.....	.....	.....	.....	.....
West Virginia	3,445	.....	532	.....	1,734	768	61	350	.....

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

[2] Corresponding figures not available.

TABLE 19.—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	340	27,934	32	65	112	50	615	44	1,486	54	3,921	74	12,590	16	5,513	4	2,685	1	1,012
1914	350	26,705	27	99	232	58	753	40	1,454	39	2,768	62	10,377	19	6,093	5	3,800	1	1,228
Alabama	10	8	5	5	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
California	10	296	.....	1	1	5	64	2	74	2	157	.....	.....	.....	.....	.....	.....	.....	.....
Colorado	5	95	1	1	1	1	9	1	25	1	60	.....	.....	.....	.....	.....	.....	.....	.....
Georgia	15	8	8	7	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	14	652	.....	2	5	3	52	6	225	.....	.....	3	370	.....	.....	.....	.....	.....	.....
Indiana	8	747	2	.....	.....	1	16	.....	.....	3	283	2	448	.....	.....	.....	.....	.....	.....
Kentucky	5	105	.....	3	4	.....	.....	1	45	1	56	.....	.....	.....	.....	.....	.....	.....	.....
Maryland	4	246	.....	1	1	1	10	.....	.....	1	90	1	145	.....	.....	.....	.....	.....	.....
Massachusetts	8	149	.....	3	9	2	21	2	57	1	62	.....	.....	.....	.....	.....	.....	.....	.....
Michigan	6	708	.....	1	3	1	8	1	35	1	71	1	150	1	441	.....	.....	.....	.....
Mississippi	4	11	2	1	1	1	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	53	5,717	.....	3	4	9	106	4	116	17	1,177	16	2,670	3	1,093	1	551	.....	.....
New York	14	1,858	2	1	2	4	58	1	31	1	69	3	610	1	303	1	785	.....	.....
North Carolina	10	7	4	6	7	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	95	11,339	1	7	10	7	84	19	637	22	1,572	29	5,082	8	2,605	2	1,349	.....	.....
Pennsylvania	22	1,868	3	3	4	2	31	4	136	3	263	6	1,063	1	371	.....	.....	.....	.....
South Carolina	3	5	.....	3	5	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	10	40	1	6	10	3	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington	3	10	1	1	2	1	8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	18	3,445	.....	.....	.....	2	28	2	56	1	61	10	1,588	2	700	.....	.....	1	1,012

TABLE 20.—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	340	350	27,934	26,705	$74,919,186	$36,942,606	$54,125,110	$24,911,050
Less than $5,000	75	106	61	167	160,589	223,918	121,223	176,782
$5,000 to $20,000	39	61	233	573	407,757	734,247	265,268	556,094
$20,000 to $100,000	71	74	1,954	2,909	4,021,309	3,485,938	2,825,302	2,452,857
$100,000 to $500,000	110	91	12,003	20,089	30,473,572	17,999,418	21,797,430	18,653,265
$500,000 to $1,000,000	35	15	8,522		24,530,231	10,277,906	18,003,075	
$1,000,000 and over	10	3	5,161	2,967	15,325,728	4,221,179	11,112,812	3,072,052
	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	22.1	30.3	0.2	0.6	0.2	0.6	0.2	0.7
$5,000 to $20,000	11.5	17.4	0.8	2.1	0.5	2.0	0.5	2.2
$20,000 to $100,000	20.9	21.1	7.0	10.9	5.4	9.4	5.2	9.8
$100,000 to $500,000	32.4	26.0	43.0	75.2	40.7	48.7	40.3	74.9
$500,000 to $1,000,000	10.3	4.3	30.5		32.7	27.8	33.3	
$1,000,000 and over	2.9	0.9	18.5	11.1	20.5	11.4	20.5	12.3

TABLE 21.—CHARACTER OF OWNERSHIP, BY STATES: 1919.

STATE.	Number of establishments owned by—			Average number of wage earners.				Per cent of total.			Value of products.				Per cent of total.		
	Individuals.	Corporations.	All others.	Total.	In establishments owned by— Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.	Total.	Of establishments owned by— Individuals.	Corporations.	All others.	Individuals.	Corporations.	All others.
United States:																	
1919	88	211	41	27,934	1,044	26,175	715	3.7	93.7	2.6	$74,919,186	$2,342,252	$71,011,800	$1,565,134	3.1	94.8	2.1
1914	96	203	51	26,705	811	25,213	681	3.0	94.4	2.6	36,942,606	1,048,272	35,005,206	889,128	2.8	94.8	2.4
Georgia	9	.....	6	8	3	.....	5	37.5	.....	62.5	22,361	12,296	.....	10,065	55.0	.....	45.0
Illinois	4	10	.....	652	44	608	.....	6.7	93.3	.....	1,851,898	127,652	1,724,246	.....	6.9	93.1	.....
Massachusetts	5	3	.....	149	43	106	.....	28.9	71.1	.....	367,590	107,387	260,203	.....	29.2	70.8	.....
New Jersey	7	42	4	5,717	204	5,207	306	3.6	91.1	5.4	16,225,650	472,222	15,127,922	625,506	2.9	93.2	3.9
New York	4	10	.....	1,858	20	1,838	.....	1.1	98.9	.....	4,726,063	47,007	4,679,056	.....	1.0	99.0	.....
North Carolina	6	.....	4	7	2	.....	5	28.6	.....	71.4	15,400	7,198	.....	8,202	46.7	.....	53.3
Ohio	8	79	8	11,339	460	10,656	223	4.1	94.0	2.0	28,675,361	1,000,963	27,188,445	485,953	3.5	94.8	1.7
Pennsylvania	6	14	2	1,868	[1] 76	1,792	.....	4.1	95.9	.....	4,564,656	[1] 181,784	4,382,872	.....	4.0	96.0	.....
South Carolina	3	.....	.....	5	5	.....	.....	100.0	.....	.....	13,275	13,275	.....	.....	100.0	.....	.....
West Virginia	1	17	.....	3,445	.....	[2] 3,445	.....	.....	100.0	.....	10,111,742	.....	[2] 10,111,742	.....	.....	100.0	.....

[1] Includes the group "All others."

[2] Includes the group "Individuals."

TABLE 22.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919.

POWER.	Number of engines or motors.		Horsepower. Amount.		Horsepower. Per cent distribution.		POWER.	Number of engines or motors.		Horsepower. Amount.		Horsepower. Per cent distribution.	
	1919	1914	1919	1914	1919	1914		1919	1914	1919	1914	1919	1914
Primary power, total	1,555	770	29,090	22,339	100.0	100.0	Primary power—Continued.						
Owned	293	336	19,728	18,733	67.8	83.9	Rented	1,263	434	9,362	3,606	32.2	16.1
Steam	242	257	18,509	17,089	63.6	76.5	Electric	1,263	434	9,312	3,604	32.0	16.1
Engines	239	257	18,124	17,089	62.3	76.5	Other	.....	.....	50	2	0.2	(1)
Turbines	3	.....	385	.....	1.3	.....	Electric	2,087	697	14,147	6,335	100.0	100.0
Internal-combustion engines	49	75	1,113	1,509	3.8	6.8	Rented	1,263	434	9,312	3,604	65.8	56.9
Water wheels, turbines, and motors	2	4	100	135	0.4	0.6	Generated by establishments reporting	824	263	4,835	2,731	34.2	43.1

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

TABLE 23.—FUEL CONSUMED, BY STATES: 1919 AND 1914.

STATE.	Coal. Anthracite (ton, 2,240 pounds).	Coal. Bituminous (ton, 2,000 pounds).	Coke (ton, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).	STATE.	Coal. Anthracite (ton, 2,240 pounds).	Coal. Bituminous (ton, 2,000 pounds).	Coke (ton, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
United States:													
1919	34,958	610,562	1,017	40,500	1,263	6,045,388	Michigan	.....	16,008	.....	6,785	.....	49,189
1914	44,461	577,774	785	70,903	(1)	8,348,257	Mississippi	.....	300	.....	.....	.....	.....
Alabama	.....	100	.....	3	5	.....	New Jersey	28,078	145,964	100	5,139	177	479
California	.....	2,050	.....	19,513	22	84,080	New York	4,675	36,256	141	118	205	648
Colorado	.....	2,534	.....	.....	200	.....	North Carolina	.....	12	40	.....	37	147
Georgia	.....	40	.....	2	15	.....	Ohio	810	225,764	.....	24	221	3,882,784
Illinois	.....	28,179	.....	1,791	.....	1,083	Pennsylvania	863	44,881	.....	3,081	.....	315,280
Indiana	.....	36,100	734	.....	3	.....	South Carolina	.....	35	.....	.....	28	.....
Kentucky	.....	6,900	.....	.....	.....	.....	Texas	.....	10	.....	4,088	44	17,406
Maryland	468	8,811	.....	.....	.....	.....	Washington	.....	260	.....	.....	1	.....
Massachusetts	36	2,112	.....	.....	.....	600	West Virginia	.....	27,377	.....	16	15	2,263,364
							All other states	28	26,869	2	30	290	30,328

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 24 presents comparative statistics for products, by kind and states, for 1919 and 1914. The total value of products here given, from the reports of the Geological Survey, is not strictly comparable with the value of products for the industry as reported by the census in other tables. The latter includes all products of the establishments irrespective of their character and the former includes production by establishments engaged primarily in other lines of manufacture.

TABLE 24.—PRODUCTS: 1919 AND 1914.

[Reported by the Geological Survey.]

	1919	1914
Total value	[1] $77,857,762	$35,398,161
Alabama	33,253	16,542
California	923,377	345,303
Colorado	192,978	61,257
Georgia	23,528	20,961
Illinois	2,104,109	780,575
Indiana	2,066,792	1,152,078
Kentucky	210,187	89,426
Maryland	487,049	206,483
Massachusetts	313,325	219,104
Michigan	2,096,874	265,194
Mississippi	16,334	15,060
Missouri	20,817	2,944
New Jersey	16,317,529	8,131,356
New Mexico	900	.....
New York	5,633,355	2,155,792
North Carolina	17,240	12,796
Ohio	30,284,017	15,351,376
Pennsylvania	4,669,127	1,746,501
South Carolina	13,275	10,668
Tennessee	564,646	97,195
Texas	95,324	58,747
Virginia	49,994	.....
Washington	28,074	(2)
West Virginia	10,386,500	3,930,464
Other states	1,309,158	728,339
Red earthenware	1,298,311	1,059,904
Ohio	293,249	300,453
Pennsylvania	232,880	194,581
California	74,222	36,931
New Jersey	34,235	35,198
Kentucky	19,889	35,731
Missouri	19,817	2,243
Washington	18,110	(2)
Texas	7,563	12,724
Georgia	5,780	16,487
Alabama	5,122	4,800
Mississippi	2,728	(2)
North Carolina	2,592	1,477
Other states	582,124	419,279
Red and brown, white lined cooking ware—Ohio, West Virginia, and New Jersey, in order named	723,981	(3)
Stoneware (not chemical) and yellow and Rockingham ware	4,603,018	3,349,301
Ohio	2,050,864	1,592,120
Illinois	808,188	483,407
Pennsylvania	318,394	282,511
Kentucky	188,230	53,695
California	152,308	(2)
Texas	86,979	44,230
Alabama	25,131	11,742
North Carolina	14,048	11,078
Stoneware (not chemical)—Continued.		
Indiana	$17,268	$39,000
Georgia	14,088	4,474
Mississippi	13,606	14,510
Other states	913,314	812,534
Chemical stoneware	805,321	(3)
Ohio	270,138	.....
Other states	535,183	.....
White ware including C. C. white granite, semiporcelain and semivitreous porcelain ware	29,847,261	14,968,079
Ohio	18,664,031	10,227,806
West Virginia	6,328,877	2,577,766
New Jersey	1,542,947	727,637
Pennsylvania	1,331,094	(2)
Other states	1,980,312	1,434,870
China, bone china, delft and belleek ware	7,708,832	2,384,686
New York	2,787,364	784,604
New Jersey	1,870,542	1,076,043
Pennsylvania	1,317,127	(2)
Other states	1,733,799	524,039
Sanitary ware, including bathtubs, washtubs, etc	14,872,364	7,874,269
New Jersey	7,931,371	5,058,204
West Virginia	1,678,760	872,987
Ohio	1,301,024	619,931
Indiana	1,199,622	739,132
Pennsylvania	622,635	(2)
California	561,666	247,770
Other states	1,586,286	336,245
Porcelain electrical supplies (not including value of metal or other fittings)	12,614,794	4,130,270
Ohio	3,717,207	1,472,359
New Jersey	3,447,830	905,878
New York	2,189,352	940,029
West Virginia	1,034,863	(2)
Other states	2,225,542	812,004
Other pottery products	[1] 5,383,880	1,631,652
Ohio	2,537,465	1,138,725
New Jersey	1,131,852	256,108
New York	396,040	54,851
Illinois	214,203	8,745
Pennsylvania	128,240	15,737
California	68,466	15,952
Massachusetts	37,742	11,345
Georgia	3,660	.....
Alabama	3,000	.....
Other states	863,212	130,189

[1] Includes saggers, made and used, to the amount of $2,115,637. [2] Included in "Other states." [3] Not classified separately in 1914.

GENERAL TABLES.

Table 25 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 and 1914. Table 26 is a detailed statement, by states, for the census of 1919.

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

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	340	27,934	29,090	$29,820	$20,794	$74,919
	1914	350	26,705	22,339	16,666	12,032	36,943
Alabama	1919	10	8	67	6	7	33
	1914	12	26	79	9	4	21
California	1919	10	296	547	339	258	849
	1914	11	177	548	191	112	421
Colorado	1919	5	95	164	82	35	200
	1914	5	53	125	20	16	67
Georgia	1919	15	8	31	5	5	22
	1914	14	32	95	8	5	27
Illinois	1919	14	652	1,207	592	389	1,852
	1914	16	1,459	1,376	915	358	1,788
Indiana	1919	8	747	711	881	778	2,624
	1914	9	770	638	585	314	1,312
Massachusetts	1919	8	149	407	159	112	308
	1914	8	138	249	85	37	170
Michigan	1919	6	708	879	851	542	2,113
	1914	6	339	319	199	126	435
New Jersey	1919	53	5,717	6,116	$6,732	$3,581	$16,226
	1914	50	5,225	3,724	3,583	2,151	7,868
New York	1919	14	1,858	1,671	1,981	1,082	4,726
	1914	16	1,691	1,009	965	1,301	1,954
North Carolina	1919	10	7	11	3	3	15
	1914	12	11	2	3	1	13
Ohio	1919	95	11,339	10,131	11,558	9,012	28,675
	1914	99	11,096	9,271	6,689	4,968	15,292
Pennsylvania	1919	22	1,868	2,198	1,761	1,353	4,565
	1914	21	1,564	1,639	866	695	1,736
South Carolina	1919	3	5	31	3	5	13
	1914	5	10	53	4	2	11
Texas	1919	10	40	212	35	27	99
	1914	11	46	123	22	18	62
West Virginia	1919	18	3,445	3,007	3,993	3,038	10,112
	1914	15	3,339	1,680	2,147	1,659	4,821
All other states	1919	39	992	1,700	839	567	2,427
	1914	40	729	1,404	366	265	945

TABLE 26.—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.
1	United States	340	30,692	183	1,206	748	621	27,934	Dc 30,342	Fe 26,106	30,702	22,747	7,579	247	129	$66,757,970
2	Alabama	10	20	12	.....	.....	.....	8	Je 10	Ja [3] 5	10	10	.....	.....	.....	21,889
3	California	10	339	9	18	8	8	296	Dc 323	Je 261	321	307	13	1	.....	746,469
4	Colorado	5	111	2	7	3	4	95	No 119	My 82	78	45	33	.....	.....	181,459
5	Georgia	15	32	23	1	.....	.....	8	No 20	Ja 2	21	21	.....	.....	.....	13,785
6	Illinois	14	746	4	42	32	16	652	Ap 774	Au 459	770	624	140	5	1	2,760,691
7	Indiana	8	843	4	35	35	22	747	Dc 810	Ja 695	814	702	98	12	2	2,556,661
8	Kentucky	5	120	5	7	1	2	105	Au 112	Fe 97	105	93	12	.....	.....	172,012
9	Maryland	4	272	3	16	4	3	246	Dc 258	Mh 228	265	189	53	19	4	398,185
10	Massachusetts	8	178	5	9	7	8	149	No 162	Ap 138	157	131	23	3	.....	446,619
11	Michigan	6	835	3	71	16	37	708	Ja 865	Je 648	819	487	329	3	.....	1,860,703
12	Mississippi	4	15	3	1	.....	.....	11	(4) 11	(4) 11	11	11	.....	.....	.....	27,250
13	New Jersey	53	6,400	16	293	228	146	5,717	Dc 6,764	Mh 4,958	6,797	5,326	1,327	91	53	16,491,580
14	New York	14	2,033	4	58	49	64	1,858	No 2,016	Ja 1,671	2,019	1,459	510	26	24	4,015,013
15	North Carolina	10	22	15	.....	.....	.....	7	Au [3] 10	Ja [3] 5	10	10	.....	.....	.....	10,070
16	Ohio	95	12,246	25	410	245	227	11,339	No 11,991	Ja 10,698	12,050	8,506	3,501	22	21	21,576,324
17	Pennsylvania	22	2,015	12	71	32	62	1,868	Oc 1,998	Fe 1,752	1,914	1,400	476	31	7	3,875,464
18	South Carolina	3	9	3	.....	1	.....	5	Je [3] 7	Ja [3] 1	3	3	.....	.....	.....	16,167
19	Texas	10	58	13	2	1	2	40	Jy 62	Ja [3] 22	46	44	2	.....	.....	162,039
20	Washington	3	14	2	1	.....	1	10	No 18	Ap 1	17	17	.....	.....	.....	25,392
21	West Virginia	18	3,689	1	132	69	42	3,445	Dc 3,748	Ja 3,272	3,745	2,708	990	31	16	9,341,202
22	All other states [6]	23	695	19	32	17	7	620	.....	.....	730	654	72	3	1	2,058,990

[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]		
$3,929,097	$2,074,335	$29,820,278	$117,384	$162,132	$2,677,855	$15,400,705	$5,303,371	$74,919,186	$54,125,110	29,090	18,124	385	1,113	106	9,362	4,835	1
.....	.....	6,478	225	478	133	3,827	3,218	32,772	25,727	67	40	.....	14	.....	13	.....	2
49,159	27,723	338,996	.....	1,050	5,939	180,613	77,663	849,243	590,967	547	40	.....	.....	.....	507	.....	3
11,970	11,421	82,064	.....	1,365	4,807	18,070	16,524	200,086	165,492	164	62	.....	.....	.....	102	.....	4
540	.....	5,180	.....	355	103	2,968	2,271	22,361	17,122	31	.....	.....	31	.....	.....	.....	5
114,713	59,794	592,226	.....	3,126	97,998	259,526	129,164	1,851,808	1,463,208	1,207	745	.....	20	.....	442	12	6
105,291	71,048	881,247	250	6,314	177,116	621,508	156,462	2,624,121	1,846,151	711	505	.....	5	.....	201	158	7
22,779	3,140	80,694	300	500	2,209	30,551	27,809	207,540	140,180	300	300	.....	.....	.....	.....	.....	8
35,869	5,692	162,782	.....	450	11,410	112,834	34,312	497,306	350,160	251	240	.....	.....	.....	11	.....	9
15,125	10,688	159,195	50	2,301	3,251	91,141	21,236	367,590	255,213	407	330	.....	.....	.....	77	.....	10
216,363	67,913	851,180	.....	.....	53,077	394,878	147,083	2,113,252	1,571,291	879	520	.....	.....	.....	359	859	11
1,200	.....	8,350	.....	.....	341	7,908	1,780	25,089	15,401	40	40	.....	.....	.....	.....	.....	12
992,434	496,235	6,732,001	2,868	13,700	457,355	2,583,948	996,831	16,225,650	12,644,871	6,116	3,960	.....	60	.....	2,096	1,583	13
219,562	146,295	1,980,984	6,778	56,470	154,953	842,157	230,483	4,726,063	3,644,423	1,671	1,225	.....	2	.....	444	831	14
.....	.....	3,186	.....	.....	43	1,248	2,067	15,400	12,085	11	.....	.....	11	.....	.....	.....	15
1,222,746	820,230	11,558,318	78,193	25,640	886,527	6,731,173	2,281,268	28,675,361	19,662,620	10,131	6,695	135	614	.....	2,687	717	16
223,393	94,723	1,761,415	15,353	3,364	269,299	1,025,061	327,612	4,564,656	3,211,983	2,198	995	.....	22	106	1,075	41	17
.....	100	3,100	.....	.....	112	1,970	2,897	13,275	8,408	31	.....	.....	6	.....	25	.....	18
3,116	3,043	34,485	240	8,400	1,237	15,330	11,785	98,621	71,506	212	111	.....	46	.....	55	.....	19
874	420	12,929	.....	550	35	5,286	4,389	28,074	18,399	47	.....	.....	2	.....	45	.....	20
604,569	224,081	3,992,995	6,000	32,989	460,998	2,285,360	752,700	10,111,742	7,073,682	3,007	1,547	250	267	.....	943	607	21
89,394	31,789	572,503	7,127	5,080	90,012	176,348	156,817	1,669,086	1,335,921	1,062	769	.....	13	.....	280	27	22

[1] Same number reported throughout the year.
[2] All other states embrace: Arkansas, 1 establishment; Connecticut, 2; District of Columbia, 2; Florida, 1; Iowa, 1; Louisiana, 1; Minnesota, 1; Missouri, 2; Nebraska, 2; New Hampshire, 1; Oregon, 2; Tennessee, 3; Utah, 1; Virginia, 2; and Wisconsin, 1.

SAND-LIME BRICK.

GENERAL STATISTICS.

General character of the industry.—This industry embraces the establishments engaged primarily in the manufacture of sand-lime bricks, a building material first segregated as the subject of an industry at the census of 1914.

Comparative summary.—Table 27 presents the general statistics for the census years 1919–1914.

Principal states, ranked by value of products.—Table 28 shows the number of establishments, average number of wage earners, value of products, and value added by manufacture for the leading states, ranked according to value of products.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 29 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 38.

Wage earners, by months—The statistics for wage earners, Table 30, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. The industry is closely allied to the building trades, and there is a wide range shown for the maximum and minimum months.

Prevailing hours of labor.—The figures in Table 31 show a change toward shorter hours of labor. In 1914, 63.7 per cent of the wage earners, and in 1919, 53.2 per cent were employed in establishments where the prevailing hours of labor per week were 60 or over.

Size of establishments, by average number of wage earners.—Table 32 shows that the average number of wage earners for all plants in 1919 was 16, as compared with 12.4 in 1914.

Size of establishments, by value of products.—Measured by value of products, there is an apparent increase in the size of establishments, though this is essentially due to the high level of values in 1919 as compared with 1914, resulting in a change from the lower to the higher groups, shown in Table 33. The average value of products per establishment in 1914 was $22,093 and in 1919, $51,970.

Character of ownership.—The establishments are almost all corporations, there being only one individual establishment and one firm in 1919 and two individual establishments and two firms in 1914. The corporations reported 97.4 per cent of the wage earners and 98.6 per cent of the value of all products.

Number and horsepower of types of prime movers.—Table 34 presents the statistics concerning power. Of the total primary power, 12.8 per cent was utilized in the form of electric power in 1919 and 6 per cent in 1914.

Fuel consumed.—Table 35 presents the statistics for fuel, by kind and by states.

TABLE 27.—COMPARATIVE SUMMARY: 1919 AND 1914.

	1919	1914	Per cent of increase,[1] 1914–1919.		1919	1914	Per cent of increase,[1] 1914–1919.
Number of establishments	32	45	.....	Paid for contract work	.....	$5,715	.....
Persons engaged	600	658	8.8	Rent and taxes	$64,978	21,120	208.0
Proprietors and firm members	3	6	.....	Cost of materials	575,402	350,484	64.2
Salaried employees	93	95	.....	Value of products	1,663,052	994,199	67.3
Wage earners (average number)	504	557	−9.5	Value added by manufacture[2]	1,087,650	643,715	69.0
Primary horsepower	4,358	5,606	−22.3				
Capital	$2,229,769	$2,184,896	2.1				
Salaries and wages	637,627	420,930	51.5				
Salaries	135,773	98,974	37.2				
Wages	501,854	321,956	55.9				

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

[2] Value of products less cost of materials.

TABLE 28.—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	32	504	100.0	.....	$1,663	100.0	.....	$1,088	100.0	.....
Michigan	7	106	21.0	1	531	31.9	1	313	28.8	1
Minnesota	3	69	13.7	2	185	11.1	2	143	13.1	2
New York	4	49	9.7	3	165	9.9	3	119	10.9	3
Indiana	3	37	7.3	4	142	8.5	4	88	8.1	4
All other states	15	243	48.3	.....	640	38.6	.....	425	39.1	.....

TABLE 29.—PERSONS ENGAGED IN THE INDUSTRY: 1919 AND 1914.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	PER CENT OF TOTAL. Female.
All classes	1919	600	586	14	97.5	2.5
	1914	658	645	13	98.0	2.0
Proprietors and officials	1919	64	63	1	98.4	1.6
	1914	71	71	.....	100.0	.....
Proprietors and firm members	1919	3	3	.....	100.0	.....
	1914	6	6	.....	100.0	.....
Salaried officers of corporations	1919	25	25	.....	100.0	.....
	1914	24	24	.....	100.0	.....
Superintendents and managers	1919	36	35	1	97.2	2.8
	1914	41	41	.....	100.0	.....
Clerks and other subordinate salaried employees.	1919	32	20	12	62.5	37.5
	1914	30	18	12	60.0	40.0
Wage earners (average number)	1919	504	503	1	99.6	0.4
	1914	557	556	1	99.8	0.2
16 years of age and over	1919	504	503	1	99.6	0.4
	1914	555	555	.....	.....	.....
Under 16 years of age	1919	.....	.....	.....	.....	.....
	1914	2	1	1	50.0	50.0

TABLE 30.—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	504	*314*	321	343	408	529	550	606	569	582	572	633	621	49.6
Males	503	*314*	321	343	408	529	550	604	567	580	570	631	619	49.8
Females	1	.....	.....	.....	.....	.....	.....	2	2	2	2	2	2	.....
1914	557	404	**396**	493	544	714	720	686	702	604	515	476	430	55.0
Michigan	106	62	48	*46*	95	120	125	128	136	131	127	128	126	33.8
Minnesota	69	66	32	*24*	32	40	86	83	87	88	101	101	88	23.8
New York	49	36	*28*	28	47	44	68	60	64	50	52	56	55	41.2
Indiana	37	*16*	17	30	53	52	45	49	42	34	35	36	35	30.2

TABLE 31.—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— 48.	Between 48 and 54.	54.	Between 54 and 60.	60.	Over 60.
United States:							
1919	504	37	48	85	66	268	.....
1914	557	81	.....	111	10	326	29
Indiana	37	12	.....	.....	13	12	.....
Michigan	106	.....	.....	13	18	75	.....
Minnesota	69	.....	30	.....	.....	39	.....
New York	49	25	.....	.....	13	11	.....

TABLE 32.—SIZE OF ESTABLISHMENTS, BY AVERAGE NUMBER OF WAGE EARNERS, FOR STATES: 1919.

STATE.	TOTAL.		ESTABLISHMENTS EMPLOYING—					
			1 to 5 wage earners, inclusive.		6 to 20 wage earners, inclusive.		21 to 50 wage earners, inclusive.	
	Establishments.	Wage earners (average number).	Establishments.	Wage earners.	Establishments.	Wage earners.	Establishments.	Wage earners.
United States 1919	32	504	5	18	18	235	9	251
1914	45	557	14	53	23	298	8	206
Indiana	3	37	.....	.....	3	37	.....	.....
Michigan	7	106	.....	.....	7	106	.....	.....
Minnesota	3	69	.....	.....	1	8	2	61
New York	4	49	1	4	2	20	1	25

TABLE 33.—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	32	45	504	557	$1,663,052	$994,199	$1,087,650	$643,715
Less than $5,000	.....	5	.....	11	.....	10,066	.....	5,914
$5,000 to $20,000	[1] 7	19	[1] 36	135	[1] 80,396	235,893	[1] 50,032	150,204
$20,000 and over	25	21	468	411	1,582,656	748,240	1,037,618	487,597
	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	.....	11.1	.....	2.0	.....	1.0	.....	0.9
$5,000 to $20,000	21.9	42.2	7.1	24.2	4.8	23.7	4.6	23.3
$20,000 and over	78.1	46.7	92.9	73.8	95.2	75.2	95.4	75.8

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

TABLE 34.—NUMBER AND HORSEPOWER OF TYPES OF PRIME MOVERS: 1919 AND 1914.

POWER.	NUMBER OF ENGINES OR MOTORS.		HORSEPOWER.			
			Amount.		Per cent distribution.	
	1919	1914	1919	1914	1919	1914
Primary power, total	63	66	4,358	5,606	100.0	100.0
Owned	40	51	3,818	5,267	87.6	94.0
Steam engines (not turbines)	32	48	3,770	5,252	86.5	93.7
Internal-combustion engines	8	3	48	15	1.1	0.3
Rented, electric	23	15	540	339	12.4	6.0
Electric	26	15	560	339	100.0	100.0
Rented	23	15	540	339	96.4	100.0
Generated by establishments reporting	3	.....	20	.....	3.6	.....

TABLE 35.—FUEL CONSUMED, BY STATES: 1919.

STATE.	COAL.		Coke (ton, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).
	Anthracite (ton, 2,240 pounds).	Bituminous (ton, 2,000 pounds).			
United States:					
1919	1,200	21,673	28	1,203	67
1914	767	25,289	712	770	([1])
Indiana	.....	3,576	.....	.....	.....
Michigan	.....	6,535	.....	.....	12
Minnesota	.....	3,160	28	3	20
New York	.....	1,692	.....	.....	7
All other states	1,200	6,710	.....	1,200	28

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 36 presents the statistics for products for 1919 in comparison with 1914. The detailed figures are for marketed sand-lime brick as reported by the United States Geological Survey and slightly exceed in value the value of products reported by the manufacturers to the Bureau of the Census.

TABLE 36.—PRODUCTS: 1919 AND 1914.

KIND AND STATE.	1919	1914	KIND AND STATE.	1919	1914
Sand-lime brick marketed in the United States:			Common brick:		
Quantity ... thousands	146,947	172,629	Quantity ... thousands	145,277	164,999
Indiana ... thousands	11,738	16,288	Value	$1,682,966	$989,249
Michigan ... thousands	42,063	42,465	Face brick:		
Minnesota ... thousands	23,391	19,958	Quantity ... thousands	1,670	7,630
New York ... thousands	10,958	18,347	Value	$22,197	$69,263
All other states ... thousands	58,797	75,571			
Value	$1,705,163	$1,058,512			
Average value per thousand	$11.60	$6.13			

GENERAL TABLES.

Comparative statistics are presented in Table 37 for such states as can be shown without disclosing the operations of individual establishments. Table 38 is a detailed statement, by states, for the census of 1919.

TABLE 37.—COMPARATIVE SUMMARY, BY STATES: 1919 AND 1914.

STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.	STATE.	Census year.	Number of establishments.	Wage earners (average number).	Primary horsepower.	Wages.	Cost of materials.	Value of products.
					Expressed in thousands.								Expressed in thousands.		
United States	1919	32	504	4,358	$502	$575	$1,663	Michigan	1919	7	106	815	$147	$218	$531
	1914	45	557	5,606	322	350	994		1914	12	136	1,392	87	95	265
Indiana	1919	3	37	517	46	53	142	All other states	1919	22	361	3,026	309	304	990
	1914	4	53	490	30	30	75		1914	29	368	3,724	205	225	654

TABLE 38.—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	32	600	3	61	20	12	504	No 633	Ja 314	691	689	2	.....	.....	$2,229,769	$110,995	$24,778
Indiana	3	45	.....	6	1	1	37	Ap 53	Ja 16	35	35	.....	.....	.....	196,883	12,222	1,626
Michigan	7	123	.....	14	.....	3	106	Au 136	Mh 46	137	137	.....	.....	.....	428,081	30,865	2,348
Minnesota	3	86	.....	8	5	4	69	Oc[1] 101	Mh 24	106	104	2	.....	.....	242,626	12,405	8,720
New York	4	56	.....	6	1	.....	49	Jo 68	Fe[1] 28	70	70	.....	.....	.....	99,938	7,448	500
All other states[2]	15	290	3	27	13	4	243	.....	.....	343	343	.....	.....	.....	1,262,241	48,055	11,584

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.
									Total.	Owned.			Rented (electric).	
	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	$501,854	.....	$34,979	$29,990	$440,763	$134,639	$1,663,052	$1,087,650	4,358	3,770	.....	48	540	20
Indiana	46,407	.....	.....	1,126	41,754	11,505	141,759	88,500	517	517	.....	.....	.....	.....
Michigan	146,855	.....	.....	18,076	184,736	32,995	530,669	312,938	815	750	.....	5	60	10
Minnesota	67,240	.....	.....	2,388	20,133	13,021	185,130	142,976	599	545	.....	29	25	.....
New York	46,182	.....	34,516	220	35,244	11,724	165,471	118,503	500	475	.....	.....	25	.....
All other states[2]	195,161	.....	463	8,180	149,896	65,394	640,023	424,733	1,927	1,483	.....	14	430	10

[1] Same number reported for one or more other months.
[2] All other states embrace: District of Columbia, 1 establishment; Florida, 2; Georgia, 1; Idaho, 1; Louisiana, 1; Massachusetts, 2; Ohio, 1; Pennsylvania, 1; South Dakota, 2; Tennessee, 1; Texas, 1; and Wisconsin, 1.

CEMENT.

GENERAL STATISTICS.

General character of the industry.—This industry embraces the establishments engaged in the manufacture of the hydraulic cements comprising Portland, natural, and puzzolan cements.

Comparative summary.—Table 39 presents the general statistics for the census years 1919, 1914, and 1909, with percentages of increase for the census periods.

Principal states, ranked by value of products.—Table 40 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 41 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 50.

Wage earners, by months.—The statistics for wage earners, Table 42, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. Females constituted but 1.3 per cent of the wage earners.

Prevailing hours of labor.—The comparative statistics for 1919, 1914, and 1909 in Table 43 show a very strong movement toward fewer hours of labor per week. The industry shows a comparatively large number of hours of labor per week considered in connection with other industries, for 41.2 per cent of the wage earners were employed in establishments where the prevailing hours of labor per week were over 60. In 1914, 66.2 per cent of all of the wage earners were in establishments of this class, and in 1909, 71.1 per cent. Very few of the wage earners were employed in establishments where the prevailing hours of labor per week were 54 or less. Although the percentage of such wage earners in 1919 was but 7, it was a material gain over 1914 and 1909.

Size of establishments, by average number of wage earners.—The industry is one of relatively large units, as shown in Table 44. The average number of wage earners per establishment was 208 in 1919 and 210 in 1914, no material change, but the 6 establishments employing over 500 wage earners embrace 25.1 per cent of the total number in 1919 as compared with 8 establishments and 22.6 per cent in 1914.

Size of establishments, by value of products.—The classification by value of products for 1919, presented in Table 45 considered in comparison with the prior censuses, necessarily reflects the great increase in values. The average value of products per establishment increased from $468,000 in 1909 to $765,000 in 1914, and to $1,425,000 in 1919, but the increase in 1919 is entirely due to high prices, for on a quantity basis the production was 8.7 per cent less than in 1914, and the number of wage earners employed was 8.6 per cent less in 1919 than the number reported in 1914.

Character of ownership.—The 123 establishments comprising the industry in 1919 include 118 corporations, 1 individual, and 4 establishments under other forms of ownership. The corporation group comprises 99.2 per cent of the wage earners and 99.4 per cent of the value of products, and the conditions with respect to character of ownership were similar in 1914 and 1909.

Number and horsepower of types of prime movers.—Table 46 presents the statistics concerning power. The establishments in this industry use a large amount of electric power purchased from hydroelectric power companies or from other sources of supply, and likewise generate considerable electric power. Of the total primary power, 70.7 per cent was utilized in the form of electric power in 1919, this including purchased electric power, specified as rented, and secondary electric or that generated by the establishments. In 1914 the ratio of total electric power to primary power was 68.7 per cent and in 1909, 42.7 per cent.

Fuel consumed.—Table 47 presents the statistics for fuel, by kind and by states.

TABLE 39.—COMPARATIVE SUMMARY: 1919, 1914, AND 1909.

	1919	1914	1909	PER CENT OF INCREASE.[1] 1914–1919	PER CENT OF INCREASE.[1] 1909–1914
Number of establishments	123	133	135	−7.5	−1.5
Persons engaged in the industry	30,247	31,958	29,511	−5.4	8.3
Proprietors and firm members	9	10	17	.....	.....
Salaried employees	4,714	4,032	2,719	16.9	48.3
Wage earners (average number)	25,524	27,916	26,775	−8.6	4.3
Primary horsepower	488,808	490,402	371,799	−0.3	31.9
Capital	$271,269,259	$243,485,046	$187,397,608	11.4	29.9
Salaries and wages	$42,690,721	$24,257,623	$18,972,729	76.0	27.9
Salaries	9,495,801	6,065,341	3,653,067	56.6	66.0
Wages	33,194,920	18,192,282	15,319,662	82.5	18.8
Paid for contract work	266,204	346,381	88,153	−30.1	293.0
Rent and taxes	6,190,367	2,493,303	729,088	148.0	242.0
Cost of materials	79,509,800	51,986,798	29,343,791	52.9	77.2
Value of products	175,264,910	101,756,444	63,205,455	72.2	61.0
Value added by manufacture[2]	95,755,110	49,769,646	33,861,664	92.4	47.2

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

[2] Value of products less cost of materials.

TABLE 40.—PRINCIPAL STATES, RANKED BY VALUE OF PRODUCT: 1919.

STATE.	Number of establishments.	WAGE EARNERS. Average number.	WAGE EARNERS. Per cent distribution.	WAGE EARNERS. Rank.	VALUE OF PRODUCTS. Amount (expressed in thousands).	VALUE OF PRODUCTS. Per cent distribution.	VALUE OF PRODUCTS. Rank.	VALUE ADDED BY MANUFACTURE. Amount (expressed in thousands).	VALUE ADDED BY MANUFACTURE. Per cent distribution.	VALUE ADDED BY MANUFACTURE. Rank.
United States	123	25,524	100.0	....	$175,265	100.0	....	$95,755	100.0	....
Pennsylvania	22	7,443	29.2	1	54,540	31.1	1	29,166	30.5	1
Indiana	5	1,953	7.6	2	13,363	7.6	2	7,499	7.8	2
Missouri	5	1,788	7.0	3	11,738	6.7	3	6,168	6.4	4
California	8	1,316	5.2	6	11,258	6.4	4	7,144	7.5	3
Michigan	11	1,387	5.4	5	9,643	5.5	5	5,681	5.9	5
New York	11	1,574	6.2	4	9,243	5.3	6	5,484	5.7	6
Illinois	5	1,123	4.4	7	$8,283	4.7	7	$4,308	4.5	7
Iowa	4	1,017	4.0	9	8,121	4.6	8	2,941	3.1	10
Kansas	8	1,084	4.2	8	6,700	3.8	9	3,388	3.6	8
Texas	5	641	2.5	12	4,743	2.7	11	3,100	3.2	9
Ohio	6	655	2.6	11	3,339	1.9	14	1,824	1.9	14
Washington	4	436	1.7	16	3,241	1.9	15	1,521	1.6	18
Utah	3	280	1.1	20	1,657	1.0	20	1,062	1.1	20
All other states	26	4,827	18.9	....	29,396	16.8	....	16,469	17.2	...

TABLE 41.—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	30,247	28,859	1,388	95.3	4.7
	1914	31,958	31,458	500	98.4	1.6
	1909	29,511	(1)	(1)	.....	.....
Proprietors and officials	1919	859	853	6	99.3	0.7
	1914	632	620	3	99.5	0.5
	1909	498	(1)	(1)	.....	.....
Proprietors and firm members	1919	9	9	.....	100.0	.....
	1914	10	(1)	(1)	.....	.....
	1909	17	(1)	(1)	.....	.....
Salaried officers of corporations	1919	275	271	4	98.5	1.5
	1914	236	(1)	(1)	.....	.....
	1909	195	(1)	(1)	.....	.....
Superintendents and managers	1919	575	573	2	99.7	0.3
	1914	386	(1)	(1)	.....	.....
	1909	286	(1)	(1)	.....	.....
Clerks and other subordinate salaried employees	1919	3,864	2,811	1,053	72.7	27.3
	1914	3,410	2,938	472	86.2	13.8
	1909	2,238	1,960	278	87.6	12.4
Wage earners (average number)	1919	25,524	25,195	329	98.6	1.4
	1914	27,916	27,891	25	99.9	0.1
	1909	26,775	26,748	27	99.9	0.1
16 years of age and over	1919	25,496	25,169	327	98.6	1.4
	1914	27,871	27,846	25	99.9	0.1
	1909	26,709	26,683	26	99.9	0.1
Under 16 years of age	1919	28	26	2	92.9	7.1
	1914	45	45	.....	.....	.....
	1909	66	65	1	98.5	1.5

[1] Figures not available.

TABLE 42.—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	25,524	*20,234*	20,563	21,964	23,864	25,083	26,028	27,690	28,445	**29,062**	28,811	28,133	26,411	69.6
Males	25,195	*19,945*	20,301	21,720	23,580	24,791	25,715	27,349	28,097	28,670	28,387	27,726	26,050	69.6
Females	329	289	**262**	*235*	284	292	313	341	348	392	424	407	361	55.4
1914	27,916	27,127	25,131	26,246	28,498	29,330	30,105	29,864	29,932	29,948	29,199	25,581	*24,031*	79.8
1909	26,775	*21,167*	22,119	24,058	25,983	27,337	27,786	28,474	28,052	29,782	**29,970**	29,044	27,528	70.6
California	1,316	*1,159*	1,201	1,160	1,168	1,283	1,304	1,363	1,333	1,335	1,385	1,494	**1,607**	72.1
Illinois	1,123	*886*	972	967	1,065	1,038	1,102	1,187	1,269	1,381	**1,388**	1,264	957	63.8
Indiana	1,053	*1,452*	1,558	1,713	1,917	1,972	2,042	2,001	2,176	2,475	1,839	2,102	2,189	58.7
Iowa	1,017	*536*	*536*	704	976	1,083	1,182	1,191	1,275	1,310	1,283	1,109	959	40.9
Kansas	1,084	*766*	855	997	1,045	1,145	1,048	1,123	1,101	1,097	**1,377**	1,335	1,119	55.6
Michigan	1,387	*958*	1,018	1,143	1,291	1,436	1,486	1,558	1,622	**1,647**	1,557	1,522	1,406	58.1
Missouri	1,788	1,744	1,709	1,650	1,753	1,783	1,791	1,855	1,892	1,837	**1,918**	1,886	*1,638*	85.4
New York	1,574	997	*855*	1,182	1,420	1,670	1,663	1,917	1,860	1,876	1,891	1,814	1,743	44.6
Ohio	655	534	*502*	563	647	599	707	737	756	736	743	691	645	66.4
Pennsylvania	7,443	6,422	*6,310*	6,383	6,766	7,012	7,508	8,027	8,106	8,355	**8,368**	8,089	7,970	75.4
Texas	641	607	*562*	619	676	616	600	638	649	676	677	688	684	81.7
Utah	280	*172*	182	233	253	290	299	304	341	352	334	305	295	48.9
Washington	436	*242*	278	366	432	456	476	509	549	524	520	462	418	44.1

TABLE 43.—AVERAGE NUMBER OF WAGE EARNERS, BY PREVAILING HOURS OF LABOR PER WEEK, FOR STATES: 1919.

STATE.	Average number employed during the year.	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	25,524	13	.....	799	.....	962	7,148	6,097	10,505
1914	27,916	(2)	(2)	24	3	73	1,536	7,790	18,490
1909	26,775	(2)	(2)	20	1	42	1,944	5,742	19,026
California	1,316	.....	.....	.....	.....	297	520	86	413
Illinois	1,123	.....	.....	.....	.....	15	928	.....	180
Indiana	1,053	.....	.....	362	.....	.....	449	1,054	88
Iowa	1,017	.....	.....	.....	.....	230	.....	.....	787
Kansas	1,084	.....	.....	.....	.....	42	246	135	661
Michigan	1,387	.....	.....	.....	.....	.....	417	.....	970
Missouri	1,788	.....	.....	.....	.....	.....	.....	1,141	647
New York	1,574	13	.....	.....	.....	1	12	781	767
Ohio	655	.....	.....	104	.....	.....	.....	143	408
Pennsylvania	7,443	.....	.....	8	.....	3	3,807	1,139	2,396
Texas	641	.....	.....	.....	.....	374	.....	130	137
Utah	280	.....	.....	88	.....	.....	97	.....	95
Washington	436	.....	.....	181	.....	.....	255	.....	.....

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

[2] Corresponding figures not available.

TABLE 44.—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	123	25,524	.....	4	6	6	74	7	302	25	2,091	56	9,094	19	6,951	4	3,160	2	3,246
1914	133	27,916	1	7	21	7	88	7	257	18	1,392	57	10,128	28	9,714	7	4,675	1	1,641
California	8	1,316	.....	.....	.....	.....	.....	1	35	1	86	5	894	1	301	.....	.....	.....	.....
Illinois	5	1,123	.....	.....	.....	1	14	.....	.....	.....	.....	2	421	2	688	.....	.....	.....	.....
Indiana	5	1,053	.....	.....	.....	.....	.....	.....	.....	2	170	.....	.....	2	811	1	972	.....	.....
Iowa	4	1,017	.....	.....	.....	.....	.....	.....	.....	1	53	1	230	2	734	.....	.....	.....	.....
Kansas	8	1,084	.....	.....	.....	.....	.....	1	42	1	91	6	951	.....	.....	.....	.....	.....	.....
Michigan	11	1,387	.....	.....	.....	.....	.....	1	45	5	426	4	490	1	417	.....	.....	.....	.....
Missouri	5	1,788	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	553	1	310	1	925	.....	.....
New York	11	1,574	.....	1	1	2	25	1	50	.....	.....	6	1,016	1	482	.....	.....	.....	.....
Ohio	6	655	.....	.....	.....	1	9	.....	.....	2	193	3	453	.....	.....	.....	.....	.....	.....
Pennsylvania	22	7,443	.....	1	3	1	8	.....	.....	3	228	10	1,728	4	1,641	1	580	2	3,246
Texas	5	641	.....	.....	.....	.....	.....	.....	.....	2	136	3	505	.....	.....	.....	.....	.....	.....
Utah	3	280	.....	.....	.....	.....	.....	.....	.....	3	280	.....	.....	.....	.....	.....	.....	.....	.....
Washington	4	436	.....	.....	.....	.....	.....	1	45	1	99	2	292	.....	.....	.....	.....	.....	.....

TABLE 45.—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	123	133	135	25,524	27,916	26,775	$175,264,910	$101,756,444	$63,205,455	$95,755,110	$49,769,646	$33,861,664
Less than $5,000	2	4	6	5	9	11	11,817	10,960	13,475	5,933	4,947	6,545
$5,000 to $20,000	1	8	10		66	127		99,584	115,349		56,968	64,397
$20,000 to $100,000	8	9	21	118	281	823	427,066	468,017	1,116,288	256,229	227,868	615,366
$100,000 to $500,000	22	41	84	1,785	13,373	15,815	7,862,005	12,926,958	33,520,319	4,024,713	20,733,571	19,175,372
$500,000 to $1,000,000	31	40		3,976			21,841,828	29,102,173		12,454,048		
$1,000,000 and over	59	31	14	19,640	14,187	9,999	145,122,194	59,148,752	28,440,024	79,014,187	28,746,292	13,999,984
	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	1.6	3.0	4.4	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
$5,000 to $20,000	0.8	6.0	7.4		0.2	0.5		0.1	0.2		0.1	0.2
$20,000 to $100,000	6.5	6.8	15.6	0.5	1.0	3.1	0.2	0.5	1.8	0.3	0.5	1.8
$100,000 to $500,000	17.9	30.8	62.2	7.0	47.9	59.1	4.5	12.7	53.0	4.2	41.7	56.8
$500,000 to $1,000,000	25.2	30.1		15.6			12.5	28.6		13.0		
$1,000,000 and over	48.0	23.3	10.4	76.9	50.8	37.3	82.8	58.1	45.0	82.5	57.7	41.4

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

TABLE 46.—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	4,686	3,698	1,850	488,808	490,402	371,799	100.0	100.0	100.0
Owned	548	754	791	306,322	326,033	317,633	62.7	66.5	85.4
Steam	477	667	717	278,009	291,321	[1] 295,138	56.9	59.4	79.4
Engines	416	.....	.....	198,353	291,321	295,138	40.6	59.4	79.4
Turbines	61	.....	.....	79,656	.....	.....	16.3	.....	.....
Internal-combustion engines	63	75	53	24,763	28,366	19,065	5.1	5.8	5.1
Water wheels and turbines	8	12	21	3,550	6,346	3,430	0.7	1.3	0.9
Rented—Electric	4,138	2,944	1,038	182,486	164,369	54,166	37.3	33.5	14.6
Electric	8,500	6,991	3,827	345,535	336,516	158,749	100.0	100.0	100.0
Rented	4,138	2,944	1,038	182,486	164,369	54,166	52.8	48.8	34.1
Generated by establishments reporting	4,362	4,047	2,789	163,049	172,147	104,583	47.2	51.2	65.8

[1] Includes 100 horsepower classified as "Other."

TABLE 47.—FUEL CONSUMED, BY STATES: 1919.

STATE.	COAL.		Coke (ton, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
	Anthracite (ton, 2,240 pounds).	Bituminous (ton, 2,000 pounds).				
United States:						
1919	272,266	6,031,428	50,840	1,859,564	1,778	4,370,699
1914	226,474	6,731,438	20,072	2,502,065	(1)	5,525,894
1909	259,220	4,815,758	4,103	1,515,697	(1)	14,721,568
California	.....	.....	.....	1,035,561	.....	.....
Illinois	.....	389,612	.....	.....	.....	.....
Indiana	.....	523,653	275	.....	.....	.....
Iowa	.....	454,502	.....	.....	100	.....
Kansas	.....	195,432	2,500	144,160	49	1,796,222
Michigan	.....	444,442	34,300	.....	581	.....
Missouri	.....	448,863	.....	9,666	.....	.....
New York	10,869	342,356	120	.....	10	.....
Ohio	.....	196,305	.....	.....	.....	500
Pennsylvania	238,458	1,623,085	1,486	51,352	673	.....
Texas	.....	50,112	11,396	549,815	.....	273,977
Utah	.....	68,187	.....	.....	.....	.....
Washington	.....	77,634	.....	26,500	.....	.....
All other states	22,939	1,217,245	763	42,510	365	2,300,000

[1] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 48 presents detailed statistics of products for 1919 and 1914. The industry was greatly affected in 1919 by the depression in building and construction work, and the states all show a decrease in the Portland cement output with the exception of Missouri, Michigan, and Texas, and in these states the increase was only nominal.

TABLE 48.—PRODUCTS—1919 AND 1914.

KIND AND STATE.	1919	1914
Total value of products	$175,264,910	$101,850,480
The cement industry	175,264,910	101,756,444
Subsidiary cement products from other industries		94,036
Cement:		
Barrels	81,306,524	89,049,766
Value	$138,713,823	$82,204,096
Portland cement—		
Barrels	80,777,935	88,230,170
Pennsylvania	25,325,173	26,570,151
Indiana	7,262,454	9,595,923
Missouri	5,216,347	4,723,906
Michigan	4,675,244	4,285,345
California	4,642,679	5,075,114
New York	4,383,579	5,886,124
Illinois	4,206,918	5,401,605
Iowa	3,573,278	4,233,707
Kansas	2,927,270	3,431,142
Cement—Continued.		
Portland cement—Continued.		
Barrels—Continued.		
Texas	2,249,735	2,100,341
Ohio	1,637,418	1,962,047
Oregon and Washington	1,561,951	(1)
Oklahoma	1,362,687	(1)
Utah	819,861	981,100
Other states	10,933,341	13,983,665
Value	$138,130,269	$81,789,368
Average unit value (barrel)	$1.71	$0.93
Natural and puzzolan cement—		
Barrels	528,589	[2] 819,596
Value	$583,554	$414,728
All other products	$36,551,087	$19,646,384

[1] Included with "Other states."

[2] Includes 751,285 barrels of natural and 68,311 barrels of puzzolan cement.

GENERAL TABLES.

Table 49 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 50 is a detailed statement, by states, for the census of 1919.

TABLE 49.—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	123	25,524	488,808	$33,195	$79,510	$175,265
	1914	133	27,916	490,402	18,192	51,987	101,756
	1909	135	26,775	371,799	15,320	20,344	63,205
California	1919	8	1,316	40,544	1,884	4,114	11,258
	1914	7	2,420	46,550	1,759	3,381	7,699
	1909	8	2,407	28,892	1,650	2,182	6,504
Illinois	1919	5	1,123	24,700	1,463	3,975	8,283
	1914	6	1,467	23,986	1,184	2,859	6,468
	1909	6	1,395	16,270	855	1,619	4,088
Indiana	1919	5	1,953	44,315	2,682	5,863	13,363
	1914	7	2,354	43,048	1,355	4,993	10,107
	1909	11	2,318	28,191	1,280	4,159	7,022
Kansas	1919	8	1,084	21,247	1,327	3,362	6,700
	1914	9	1,002	22,037	673	1,399	3,162
	1909	12	2,143	61,754	1,359	1,556	4,682
Michigan	1919	11	1,387	35,470	1,739	3,963	9,643
	1914	17	1,340	24,158	975	2,408	4,529
	1909	13	1,306	21,773	826	1,403	2,915
New York	1919	11	1,574	37,236	$2,087	$3,759	$9,243
	1914	12	2,283	33,363	1,610	3,507	6,840
	1909	15	1,443	24,385	810	800	2,409
Ohio	1919	6	655	13,514	975	1,514	3,339
	1914	7	849	6,975	521	890	2,112
	1909	9	887	12,685	544	638	1,465
Pennsylvania	1919	22	7,443	98,058	9,594	25,374	54,540
	1914	26	7,910	132,894	4,428	15,827	29,081
	1909	27	8,080	102,904	3,875	10,108	18,855
Texas	1919	5	641	16,390	568	1,643	4,743
	1914	4	583	18,150	371	1,264	2,331
Utah	1919	3	280	7,778	359	595	1,657
	1914	3	264	7,241	277	471	1,233
Washington	1919	4	436	19,536	716	1,720	3,241
	1914	5	620	18,237	495	1,512	2,639
All other states	1919	35	7,632	130,020	9,801	23,628	49,255
	1914	30	6,824	113,763	4,544	13,476	25,555
	1909	34	6,796	75,945	4,121	6,879	15,265

TABLE 50.—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.
															Dollars.	*Dollars.*	*Dollars.*
United States	123	30,247	9	850	2,811	1,053	25,524	Se 29,062	Ja 20,234	26,895	26,503	362	28	2	271,269,259	4,031,334	5,464,467
California	8	1,538	.....	71	120	31	1,316	De 1,607	Ja 1,159	1,525	1,499	26	.....	.....	31,097,607	312,976	278,942
Illinois	5	1,304	.....	24	118	39	1,123	Oc 1,388	Ja 886	1,173	1,168	5	.....	.....	13,065,675	216,052	259,338
Indiana	5	2,420	.....	108	259	100	1,953	Se 2,475	Ja 1,452	2,183	2,089	94	.....	.....	11,814,207	305,175	571,724
Iowa	4	1,170	.....	29	99	25	1,017	Se 1,310	Ja[1] 536	1,041	1,025	16	.....	.....	11,747,401	94,261	194,482
Kansas	8	1,241	2	34	92	29	1,084	Oc 1,377	Ja 766	1,303	1,294	9	.....	.....	8,690,142	110,608	235,520
Michigan	11	1,566	1	78	81	19	1,387	Se 1,647	Ja 958	1,294	1,277	17	.....	.....	10,540,992	203,492	155,121
Missouri	5	2,270	.....	59	243	180	1,788	Oc 1,918	De 1,638	1,638	1,585	50	1	2	12,779,048	211,720	418,377
New York	11	2,034	2	92	241	125	1,574	Jy 1,917	Fe 855	1,761	1,741	18	2	.....	20,547,761	265,114	324,984
Ohio	6	723	2	19	35	12	655	Au 756	Fe 502	646	644	2	.....	.....	4,346,385	73,056	66,931
Pennsylvania	22	8,969	.....	95	1,072	359	7,443	Oc 8,368	Fe 6,310	7,993	7,909	59	25	.....	62,354,245	1,391,345	2,054,980
Texas	5	741	.....	33	54	13	641	No 688	Fe 562	677	677	.....	.....	.....	9,448,086	126,500	135,479
Utah	3	308	.....	15	10	3	280	Se 352	Ja 172	288	281	7	.....	.....	3,488,664	41,153	19,019
Washington	4	484	.....	22	18	8	436	Au 549	Ja 242	468	463	5	.....	.....	6,200,923	64,138	40,745
All other states[2]	26	5,479	2	171	369	110	4,827	.....	.....	4,905	4,851	54	.....	.....	65,148,123	615,744	708,825

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.	Rented (electric).	Electric horsepower generated in establishments reporting.
	Dollars.	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*	*Dollars.*							
United States	33,194,920	206,204	2,390,468	3,793,899	48,439,204	31,070,596	175,264,910	95,755,110	488,808	198,353	79,656	24,763	3,550	182,486	163,049
California	1,884,477	.....	.....	223,982	1,983,891	2,130,126	11,258,473	7,144,456	40,544	105	.....	25	.....	40,414	.....
Illinois	1,462,737	.....	10,500	115,310	2,537,451	1,437,662	8,282,989	4,307,876	24,700	12,050	6,200	.....	.....	6,450	10,949
Indiana	2,682,173	.....	1,647,942	306,907	3,871,335	1,992,030	13,362,808	7,499,443	44,315	9,240	14,141	.....	.....	20,934	19,609
Iowa	1,515,337	85,233	.....	245,010	3,467,156	1,712,930	8,121,014	2,940,928	17,331	13,725	3,600	6	.....	.....	17,953
Kansas	1,320,976	26,447	2,202	117,764	2,049,878	1,311,800	6,699,799	3,338,121	21,247	13,832	400	7,015	.....	.....	10,803
Michigan	1,738,993	814	38,537	204,450	2,094,766	1,867,821	9,643,454	5,680,867	35,470	15,105	15,600	305	2,000	2,460	19,398
Missouri	2,310,336	.....	.....	182,261	3,481,732	2,088,420	11,738,161	6,168,009	35,170	2,590	1,215	.....	.....	31,365	1,255
New York	2,086,603	3,374	1,719	294,867	1,850,628	1,907,951	9,242,547	5,483,968	37,236	14,433	8,650	6,050	.....	8,103	14,885
Ohio	975,029	21,510	.....	43,810	615,907	898,344	3,338,594	1,824,343	13,514	5,225	1,000	80	.....	7,209	3,498
Pennsylvania	9,594,087	53,449	602,872	1,168,463	16,289,288	9,084,447	54,539,872	29,166,137	98,058	79,671	12,759	22	.....	5,606	25,991
Texas	567,650	.....	.....	217,540	515,199	1,127,932	4,743,343	3,100,212	16,390	125	4,500	6,400	.....	5,365	7,969
Utah	359,203	2,072	40	52,563	271,303	323,754	1,656,939	1,061,882	7,778	.....	.....	.....	.....	7,778	.....
Washington	716,093	.....	.....	57,180	988,175	731,971	3,241,114	1,520,968	19,536	100	.....	.....	1,500	17,936	1,500
All other states[2]	5,975,216	73,305	2,656	563,783	8,422,495	4,455,408	29,395,803	16,517,900	77,519	32,152	11,591	4,860	50	28,866	29,239

[1] Same number reported for one or more other months.

[2] All other states embrace: Alabama, 2 establishments; Colorado, 2; Georgia, 1; Kentucky, 1; Maine, 2; Maryland, 2; Minnesota, 3; Montana, 2; Nebraska, 1; New Jersey, 2; Oklahoma, 3; Oregon, 1; Tennessee, 2; Virginia, 1; and West Virginia, 1.

LIME.

GENERAL STATISTICS.

General character of the industry.—The present report embraces establishments engaged primarily in the burning of lime.

Comparative summary.—Table 51 presents the comparative statistics for the industry for the census years 1919, 1914, 1909, and 1904, with percentages of increase for the census periods. Prior to 1904 the industry was combined with cement and wall plaster.

Principal states, ranked by value of products.—Table 52 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. Although the majority of the states are represented in the industry, yet the six leading states—Pennsylvania, Ohio, West Virginia, Massachusetts, Missouri, and Virginia—reported nearly 60 per cent of the products.

Persons engaged in the industry.—The age classification of the average number of wage earners in Table 53 is an estimate obtained by the method described in the "Explanation of terms." Figures for states will be found in Table 63.

Wage earners, by months.—The statistics for wage earners, Table 54, are intended to show the steadiness of employment, or the reverse, in accordance with the industrial conditions existing during the year. The few females incidentally reported as wage earners are negligible.

Prevailing hours of labor.—The statistics presented in Table 55 show a material reduction in the hours of labor per week. In 1909, 82.9 per cent of the wage earners were employed in plants where the prevailing hours of labor were 60 or over per week. This proportion decreased to 73.1 per cent in 1914, and still further to 64.3 per cent in 1919. On the other hand, but a fraction of 1 per cent was reported for establishments in 1909 where the prevailing hours of labor were 48 per week or less, and 1.7 per cent in 1914. In 1919 this proportion increased to 11 per cent.

Size of establishments, by average number of wage earners.—The average number of wage earners per establishment was 20 in 1914 and 24 in 1919. The majority of the establishments are owned by individuals or firms and a relatively large number employ not exceeding 5 wage earners. In 1919 the establishments employing over 100 wage earners, 23 in number, shown in Table 56, reported 32.8 per cent of all wage earners, and in 1914 there were 25 establishments of this character with 35 per cent of the wage earners.

Size of establishments, by value of products.—Comparative figures for groups by value of products, presented in Table 57 for 1919 and 1914, are necessarily affected by the general increase in values. The average value of products per establishment increasd from $21,000 in 1909 to $29,000 in 1914 and to $71,000 in 1919. On a quantity production basis the industry shows a slight decrease.

Character of ownership.—Table 58 presents the statistics for establishments classified according to form of ownership. The decrease in number of establishments in 1919 as compared with prior censuses is essentially in the individual and "all other" groups, the latter comprising chiefly firms, and the proportion of the business done by the corporations has progressively increased whether measured by number of wage earners or by value of products.

Number and horsepower of types of prime movers.—Table 59 presents the power statistics for the industry for 1919, 1914, and 1909. Electric power is a growing factor, and of the total primary power, 55.3 per cent was purchased electric power in 1919, as compared with 28.8 per cent in 1914 and 5.4 per cent in 1909.

Fuel consumed.—Table 60 presents the statistics for fuel, by kind and by states. The figures for gas include both natural and manufactured gas.

TABLE 51.—COMPARATIVE SUMMARY: 1919, 1914, 1909, AND 1904.

	1919	1914	1909	1904	PER CENT OF INCREASE.[1] 1914–1919	1909–1914	1904–1909
Number of establishments	476	627	853	526	−25.1	−26.5	62.2
Persons engaged	12,855	13,975	15,659	12,383	−8.0	−10.7	26.5
Proprietors and firm members	349	500	794	500	−30.5	−37.0	58.8
Salaried employees	1,101	1,046	968	731	5.3	8.1	32.4
Wage earners (average number)	11,405	12,429	13,897	11,152	−8.2	−10.6	24.6
Primary horsepower	51,735	39,134	27,671	18,198	32.2	41.4	52.1
Capital	$45,844,532	$34,123,948	$32,520,260	$22,596,000	34.3	4.9	43.9
Salaries and wages	12,865,076	7,329,873	7,059,881	5,300,000	75.5	3.8	33.2
Salaries	1,995,880	1,290,265	1,079,657	703,000	54.7	19.5	53.6
Wages	10,869,196	6,039,608	5,980,174	4,597,000	80.0	1.0	30.1
Paid for contract work	70,430	110,545	56,053	33,813	−36.3	97.2	65.8
Rent and taxes	985,500	225,847	184,644	[2] 158,972	336.4	22.3	.....
Cost of materials	14,296,925	7,557,670	6,730,906	5,437,000	89.2	12.3	23.8
Value of products	33,970,463	18,390,805	17,951,987	14,751,000	84.7	2.4	21.7
Value added by manufacture[3]	19,673,538	10,833,135	11,221,081	9,314,000	81.6	−3.6	20.5

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

TABLE 52.—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	476	11,405	100.0	....	$33,970	100.0	....	$19,673	100.0	...
Pennsylvania	158	2,539	22.3	1	7,556	22.2	1	4,554	23.2	1
Ohio	30	1,191	10.4	2	4,021	11.8	2	2,320	11.8	2
West Virginia	9	727	6.4	5	2,395	7.0	3	1,488	7.6	3
Massachusetts	12	501	4.4	7	2,114	6.2	4	1,145	5.8	5
Missouri	16	736	6.5	4	2,090	6.2	5	1,298	6.6	4
Virginia	37	750	6.6	3	1,875	5.5	6	1,145	5.8	6
Alabama	10	291	2.5	14	1,149	3.4	8	508	2.6	12
Wisconsin	20	392	3.4	10	1,130	3.3	9	713	3.6	8
Tennessee	16	527	4.6	6	1,100	3.2	10	649	3.3	9
Illinois	11	378	3.3	11	1,065	3.1	11	734	3.7	7
Maryland	36	468	4.1	8	1,049	3.1	12	498	2.5	13
Indiana	5	419	3.7	9	939	2.8	13	551	2.8	11
New York	16	335	2.9	13	832	2.4	14	441	2.3	15
Texas	7	226	2.0	15	$798	2.3	15	$475	2.4	14
Connecticut	5	191	1.7	17	770	2.3	16	351	1.8	16
Michigan	6	222	1.9	16	626	1.8	17	335	1.7	17
California	8	159	1.4	20	564	1.7	18	283	1.4	19
Vermont	8	160	1.4	19	459	1.4	19	199	1.0	20
Minnesota	5	167	1.5	18	427	1.3	20	307	1.6	18
Washington	5	150	1.3	21	341	1.0	21	195	1.0	21
Arkansas	4	76	0.7	22	188	0.6	22	106	0.5	23
Utah	12	45	0.4	27	140	0.4	24	97	0.5	24
South Dakota	3	14	0.1	32	59	0.2	30	35	0.2	30
New Mexico	4	13	0.1	33	27	0.1	34	23	0.1	33
New Jersey	5	12	0.1	34	26	0.1	35	17	0.1	36
All other states	28	716	6.3	....	2,230	6.6	....	1,206	6.1	...

TABLE 53.—PERSONS ENGAGED IN THE INDUSTRY: 1919, 1914, AND 1909.

CLASS.	Census year.	Total.	Male.	Female.	PER CENT OF TOTAL. Male.	Female.
All classes	1919	12,855	12,640	215	98.3	1.7
	1914	13,975	13,803	172	98.7	1.3
	1909	15,659	(1)	(1)	(1)	(1)
Proprietors and officials	1919	956	922	34	96.4	3.6
	1914	1,008	980	28	97.2	2.8
	1909	1,335	(1)	(1)	(1)	(1)
Proprietors and firm members	1919	349	332	17	95.1	4.9
	1914	500	477	23	95.4	4.6
	1909	794	(1)	(1)	(1)	(1)
Salaried officers of corporations	1919	252	240	12	95.2	4.8
	1914	189	184	5	97.4	2.6
	1909	191	(1)	(1)	(1)	(1)
Superintendents and managers	1919	355	350	5	98.6	1.4
	1914	319	319	.....	100.0	.....
	1909	350	(1)	(1)	(1)	(1)
Clerks and other subordinate salaried employees.	1919	494	325	169	65.8	34.2
	1914	538	407	131	75.7	24.3
	1909	427	335	92	78.5	21.5
Wage earners (average number)	1919	11,405	11,393	12	99.9	0.1
	1914	12,429	12,416	13	99.9	0.1
	1909	13,897	13,889	8	99.9	0.1
16 years of age and over	1919	11,382	11,370	12	99.9	0.1
	1914	12,402	12,389	13	99.9	0.1
	1909	13,856	13,848	8	99.9	0.1
Under 16 years of age	1919	23	23	.....	100.0	.....
	1914	27	27	.....	100.0	.....
	1909	41	41	.....	100.0	.....

[1] Figures not available.

TABLE 54.—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	11,405	10,442	*10,370*	10,844	11,515	11,572	11,306	11,445	12,034	**12,143**	11,860	11,809	11,511	85.4
Males	11,393	10,432	*10,359*	10,833	11,506	**11,562**	11,295	11,435	12,024	**12,130**	11,856	11,795	11,489	85.4
Females	12	10	11	11	*9*	10	**11**	10	10	13	13	14	22	40.9
1914	12,429	11,076	10,811	11,961	13,164	13,407	13,154	13,342	**13,745**	13,670	12,876	11,768	*10,174*	74.0
Alabama	291	300	290	285	286	*282*	283	289	283	291	297	292	**314**	90.0
Arkansas	76	70	81	**86**	83	*65*	66	73	73	77	70	83	76	75.6
California	159	166	170	169	**178**	174	161	152	159	147	*141*	143	148	79.2
Connecticut	191	183	180	*178*	182	198	195	199	195	191	194	198	**199**	89.4
Illinois	378	*304*	308	322	381	416	412	**417**	397	401	408	398	372	72.9
Indiana	419	432	449	422	435	426	418	393	430	431	450	396	*346*	76.9
Maryland	468	482	426	482	507	511	476	441	499	530	*403*	447	412	76.0
Massachusetts	501	459	454	*445*	475	507	508	503	519	539	532	**542**	529	82.1
Michigan	222	181	172	*162*	199	243	248	237	263	260	243	229	227	61.6
Minnesota	167	118	*99*	121	174	211	192	194	183	173	174	188	177	51.0
Missouri	736	*610*	634	659	700	698	688	728	850	846	853	811	755	71.5
New Jersey	12	9	*7*	14	**16**	14	12	13	13	12	10	10	14	43.8
New Mexico	13	8	8	*6*	*6*	8	7	16	19	12	17	26	23	23.1
New York	335	359	324	335	315	*293*	301	304	322	338	354	375	**400**	73.5
Ohio	1,191	968	*958*	1,089	1,203	1,274	1,257	1,308	**1,315**	1,299	1,290	1,195	1,136	72.9
Pennsylvania	2,539	*2,440*	2,498	2,569	**2,616**	2,588	2,509	2,505	2,595	2,611	2,549	2,507	2,481	93.3
South Dakota	14	14	14	*13*	14	*13*	14	14	16	**16**	14	*13*	*13*	81.2
Tennessee	527	527	512	537	536	525	*494*	525	538	**543**	539	525	523	91.0
Texas	226	*171*	*171*	180	199	206	203	211	251	224	265	319	312	53.6
Utah	45	*27*	46	40	41	52	**58**	34	46	**58**	41	54	43	46.6
Vermont	160	154	150	*138*	169	151	150	150	157	**179**	174	177	171	77.1
Virginia	750	704	*684*	760	**854**	809	706	712	768	792	712	728	771	80.1
Washington	150	144	130	139	158	145	131	*125*	147	151	177	**185**	168	67.6
West Virginia	727	740	**755**	744	718	706	736	726	**755**	748	*697*	700	699	92.3
Wisconsin	392	*292*	306	350	420	430	**437**	429	427	421	427	407	358	66.8

TABLE 55.—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	11,405	27	4	1,224	211	1,456	1,149	6,357	977
1914	12,429	(2)	(2)	220	237	1,142	1,750	7,257	1,823
1909	13,897	(2)	(2)	114	156	818	1,295	8,573	2,941
Alabama	291	.....	.....	47	19	35	.....	80	110
California	159	14	.....	40	.....	6	64	.....	35
Connecticut	191	.....	.....	.....	.....	146	.....	45	.....
Illinois	378	.....	.....	71	62	35	36	172	2
Indiana	419	.....	.....	131	.....	.....	.....	142	146
Maryland	468	3	.....	150	.....	12	134	169	.....
Massachusetts	501	.....	.....	85	.....	353	.....	.....	63
Michigan	222	.....	.....	.....	.....	.....	.....	222	.....
Minnesota	167	.....	.....	.....	.....	5	.....	162	.....
Missouri	736	.....	.....	.....	.....	58	.....	547	131
New York	335	.....	.....	10	5	115	44	161	.....
Ohio	1,191	.....	.....	9	.....	172	61	949	.....
Pennsylvania	2,539	9	4	28	13	107	636	1,664	78
Tennessee	527	.....	.....	90	13	15	17	226	166
Texas	226	.....	.....	1	16	15	69	125	.....
Vermont	160	.....	.....	.....	.....	151	.....	.....	9
Virginia	750	.....	.....	95	53	38	34	530	.....
Washington	150	.....	.....	13	.....	67	27	.....	43
West Virginia	727	.....	.....	.....	.....	.....	.....	623	104
Wisconsin	392	.....	.....	26	.....	27	14	325	.....

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

[2] Corresponding figures not available.

TABLE 56.—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	476	11,405	28	187	342	105	1,262	87	2,994	46	3,066	19	2,601	4	1,140	.....	.....
1914	627	12,429	54	203	552	119	1,449	104	3,371	32	2,165	19	2,640	5	1,651	1	601
Illinois	11	378	1	2	5	1	12	3	100	4	261	.....	.....	.....	.....	.....	.....
Indiana	5	419	.....	.....	.....	1	19	.....	.....	2	123	2	277	.....	.....	.....	.....
Maryland	36	468	2	25	55	5	71	1	35	1	60	2	247	.....	.....	.....	.....
Massachusetts	12	501	.....	.....	.....	3	43	6	185	2	167	1	106	.....	.....	.....	.....
Missouri	16	736	1	1	5	5	49	5	195	2	181	2	306	.....	.....	.....	.....
New York	16	335	.....	8	20	2	26	4	157	2	132	.....	.....	.....	.....	.....	.....
Ohio	30	1,191	.....	8	18	4	46	8	299	8	534	2	294	.....	.....	.....	.....
Pennsylvania	158	2,539	11	99	151	22	256	12	422	8	526	4	576	2	608	.....	.....
Tennessee	16	527	.....	3	6	5	66	5	181	2	149	1	125	.....	.....	.....	.....
Virginia	37	750	4	8	17	11	119	9	254	4	253	1	107	.....	.....	.....	.....
West Virginia	9	727	1	3	7	.....	.....	1	30	.....	.....	3	438	1	252	.....	.....
Wisconsin	20	392	.....	3	8	9	124	7	207	1	53	.....	.....	.....	.....	.....	.....

TABLE 57.—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	476	627	853	11,405	12,429	13,897	$33,970,463	$18,390,805	$17,951,987	$19,673,538	$10,833,135	$11,221,081
Less than $5,000	149	314	460	141	432	684	292,907	568,191	787,432	194,501	364,917	529,224
$5,000 to $20,000	97	109	161	496	973	1,547	1,050,160	1,198,125	1,725,237	637,148	737,529	1,139,472
$20,000 to $100,000	129	161	199	2,794	5,259	6,982	7,026,586	7,345,974	8,761,922	4,310,348	4,316,431	5,507,983
$100,000 to $500,000	89	38	33	5,886	5,765	4,684	16,926,727	6,164,103	6,677,396	9,769,836	5,414,258	4,044,402
$500,000 and over	12	5		2,088			8,674,083	3,114,412		4,761,705		
	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	31.3	50.1	53.9	1.2	3.5	4.9	0.9	3.1	4.4	1.0	3.4	4.7
$5,000 to $20,000	20.4	17.4	18.9	4.4	7.8	11.1	3.1	6.5	9.6	3.2	6.8	10.2
$20,000 to $100,000	27.1	25.7	23.3	24.5	42.3	50.3	20.7	39.9	48.8	21.9	39.8	49.1
$100,000 to $500,000	18.7	6.0	3.9	51.6	46.4	33.7	49.8	33.6	37.2	49.7	5.0	36.0
$500,000 and over	2.5	0.8		18.3			25.5	16.9		24.2		

TABLE 58.—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.	In 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	194	224	58	11,405	1,034	9,623	748	9.1	84.4	6.5	$33,970,463	$2,702,603	$29,231,305	$2,036,555	8.0	86.0	6.0
1914	333	222	72	12,429	1,802	9,846	781	14.5	79.2	6.3	18,390,805	2,419,142	14,892,684	1,078,979	13.1	81.0	5.9
1909	484	248	121	13,897	2,615	9,960	1,322	18.8	71.7	9.5	17,951,987	2,793,490	13,483,159	1,675,338	15.6	75.0	9.4
Illinois	3	7	1	378	.....	337	[1] 41	.....	89.2	10.8	1,064,548	.....	971,498	[1] 93,050	.....	91.3	8.7
Indiana	.....	4	1	419	.....	[2] 419	.....	.....	100.0	.....	938,723	.....	[2] 938,723	.....	.....	100.0	.....
Maryland	19	12	5	468	29	351	88	6.2	75.0	18.8	1,049,265	97,106	704,353	247,806	9.3	67.1	23.6
Massachusetts	1	10	1	501	.....	[3] 501	.....	.....	100.0	.....	2,113,741	.....	[3] 2,113,741	.....	.....	100.0	.....
Missouri	.....	13	3	736	.....	725	11	.....	98.5	1.5	2,090,126	.....	2,067,345	22,781	.....	98.9	1.1
New York	9	7	.....	335	77	258	.....	23.0	77.0	.....	832,141	210,362	621,779	.....	25.3	74.7	.....
Ohio	5	21	4	1,191	61	1,031	99	5.1	86.6	8.3	4,021,106	132,985	3,654,029	234,092	3.3	90.9	45.8
Pennsylvania	103	36	19	2,539	387	2,036	116	15.2	80.2	4.6	7,556,372	1,107,068	6,202,864	246,440	14.7	82.1	3.3
Tennessee	6	7	3	527	118	332	77	22.4	63.0	14.6	1,099,620	144,384	773,266	181,970	13.1	70.3	16.5
Virginia	9	25	3	750	36	699	15	4.8	93.2	2.0	1,875,173	78,220	1,761,651	35,302	4.2	93.9	1.9
West Virginia	3	5	11	727	.....	720	[1] 7	.....	99.0	1.0	2,394,667	.....	2,374,569	[1] 20,098	.....	99.2	0.8
Wisconsin	2	17	1	392	.....	374	[1] 18	.....	95.4	4.6	1,130,092	.....	1,077,983	[1] 52,109	.....	95.4	4.6

[1] Includes the group "Individuals." [2] Includes the group "All others." [3] Includes the groups "Individuals" and "All others."

TABLE 59.—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	1,633	1,103	607	51,735	39,134	27,671	100.0	100.0	100.0
Owned	472	676	.....	23,140	27,826	26,174	44.7	71.1	94.6
Steam [1]	329	543	528	19,946	25,388	24,271	38.6	64.9	87.7
Engines	320	543	528	18,732	25,388	24,271	36.2	64.9	87.7
Turbines	9	.....	.....	1,214	.....	.....	2.3	.....	.....
Internal-combustion engines	139	123	87	2,944	2,122	1,462	5.7	5.4	5.3
Water wheels, turbines, and motors	4	10	12	250	316	441	0.5	0.8	1.6
Rented	1,161	427	79	28,595	11,308	1,497	55.3	28.9	5.4
Electric	1,161	427	79	28,595	11,253	1,497	55.3	28.8	5.4
Other	.....	.....	.....	.....	55	.....	.....	0.1	.....
Electric	1,333	519	113	32,155	12,851	1,560	100.0	100.0	100.0
Rented	1,161	427	79	28,595	11,253	1,497	88.9	87.6	96.9
Generated by establishments reporting	172	92	34	3,560	1,598	1,063	11.1	12.4	63.1

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

TABLE 60.—FUEL CONSUMED, BY STATES: 1919.

STATE.	COAL.		Coke (ton, 2,000 pounds).	Fuel oils (barrels).	Gasoline and other volatile oils (barrels).	Gas (1,000 cubic feet).
	Anthracite [1] (ton, 2,240 pounds).	Bituminous (ton, 2,000 pounds).				
United States:						
1919	57,112	872,910	102,788	21,301	5,519	53,835
1914	76,141	677,071	60,159	82,447	(2)	673,853
Alabama	.....	27,046	.....	.....	4	500
Arkansas	.....	600	.....	2,500	24	.....
California	.....	68,374	.....	.....	.....	.....
Connecticut	23	13,825	.....	.....	42	.....
Illinois	25	18,647	.....	.....	.....	.....
Indiana	.....	41,455	.....	.....	.....	.....
Maryland	3,359	5,442	15,918	32	247	.....
Massachusetts	15	30,044	2,802	.....	236	.....
Michigan	886	4,161	7,092	7,135	2,895	.....
Minnesota	.....	5,084	.....	31	26	.....
Missouri	.....	46,191	.....	.....	59	.....
New Jersey	705	200	218	.....	.....	.....
New Mexico	.....	606	.....	.....	.....	.....
New York	2,546	32,175	.....	73	.....	.....
Ohio	.....	161,673	.....	20	534	52,316
Pennsylvania	43,738	195,080	49,070	133	264	390
South Dakota	.....	2,126	.....	.....	6	.....
Tennessee	.....	43,393	.....	6	5	.....
Texas	.....	24,745	1,300	6,551	25	.....
Utah	.....	2,219	1,341	90	30	.....
Vermont	.....	14,669	.....	.....	.....	.....
Virginia	2,696	41,627	6,292	3	15	.....
Washington	3,119	.....	.....	.....	69	.....
West Virginia	.....	54,388	18,688	.....	.....	629
Wisconsin	.....	3,163	.....	200	901	.....
All other states	.....	35,977	67	4,527	137	.....

[1] Includes some semianthracite.

[2] Included in figures for fuel oils.

SPECIAL STATISTICS.

Products.—Table 61 presents comparative statistics for products, by states, for 1919, 1914, and 1909. The quantities and values are as reported by the Geological Survey. The census reports carry the value of all products. The containers, an important item in the value of products, not included in the figures as reported by the Geological Survey, are included in this table under the item "All other products." Further, the Geological Survey reports are based upon lime burned and sold during the respective years, while the products as reported to the census represent production, whether sold or carried in stock.

TABLE 61.—PRODUCTS: 1919, 1914, AND 1909.

PRODUCT.	1919	1914	1909
Total value	$33,970,463	$18,390,805	$17,951,987
Lime:			
Tons (2,000 pounds)	3,071,423	3,380,928	3,484,974
Value	$27,643,000	$13,268,938	$13,846,072
Average value per ton	$9.00	$3.92	$3.98
Quicklime—			
Tons	2,301,488	2,865,807	3,277,363
Value	$20,482,600	$11,029,022	$12,932,922
Hydrated lime—			
Tons	769,935	515,121	207,611
Value	$7,160,400	$2,239,916	$913,150
All other products	$2,327,463	$5,121,867	$4,105,915

LIME PRODUCTION, BY STATE.[1]	1919	1914	1909
United States	3,071,423	3,380,928	3,484,974
Pennsylvania	779,608	849,963	881,439
Ohio	512,614	480,010	343,754
Virginia	223,768	243,990	164,695
Missouri	180,749	155,680	182,456
West Virginia	174,167	192,195	89,569
Michigan	145,783	66,507	83,108
Alabama	135,095	46,966	75,268
Massachusetts	131,762	124,199	136,546
New York	126,404	94,009	134,732
Wisconsin	123,620	227,469	268,250
Tennessee	116,346	85,939	79,903
Indiana	107,460	99,185	99,325
Maryland	103,563	155,845	125,436
Maine	96,582	122,218	178,564
Illinois	65,000	87,603	104,260
All other states	48,902	349,150	537,665

[1] Reported in tons of 2,000 pounds.

GENERAL TABLES.

Table 62 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. Table 63 is a detailed statement, by states, for the census of 1919.

TABLE 62.—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	476	11,405	51,735	$10,869	$14,297	$33,970
	1914	627	12,429	39,134	6,040	7,558	18,391
	1909	853	13,897	27,071	5,980	6,731	17,952
Alabama	1919	10	291	809	305	641	1,149
	1914	14	390	871	147	196	368
	1909	15	411	723	136	182	426
Arkansas	1919	4	76	240	55	82	188
	1914	7	189	457	54	82	188
	1909	9	157	137	51	78	161
California	1919	8	159	345	170	281	564
	1914	7	213	220	130	116	316
	1909	15	410	558	234	212	609
Connecticut	1919	5	191	85	196	419	770
	1914	10	284	476	158	265	489
	1909	10	325	170	160	275	553
Illinois	1919	11	378	1,068	409	331	1,065
	1914	14	448	2,077	265	276	747
	1909	16	511	794	283	174	688
Indiana	1919	5	419	1,553	341	388	939
	1914	6	202	582	84	151	284
	1909	10	440	890	175	182	447
Maryland	1919	36	468	2,111	263	551	1,049
	1914	25	266	605	99	152	390
	1909	43	397	942	128	132	420
Massachusetts	1919	12	501	2,028	523	969	2,114
	1914	11	474	997	231	370	817
	1909	9	557	589	304	337	864
Michigan	1919	6	222	1,195	183	291	626
	1914	8	150	653	88	132	318
	1909	11	157	265	85	134	327
Minnesota	1919	5	167	260	169	120	427
	1914	5	223	328	127	139	342
	1909	8	203	319	101	143	311
Missouri	1919	16	736	1,936	650	792	2,090
	1914	19	531	1,593	277	409	890
	1909	31	692	1,314	317	461	1,031
New Jersey	1919	5	12	65	11	9	26
	1914	12	46	89	20	25	62
	1909	19	211	342	78	73	201
New York	1919	16	335	2,386	$317	$391	$832
	1914	23	310	726	149	189	503
	1909	33	465	781	236	176	580
Ohio	1919	30	1,191	9,175	1,262	1,701	4,021
	1914	38	1,416	7,374	777	706	2,334
	1909	39	1,273	3,872	553	598	1,620
Pennsylvania	1919	158	2,539	12,554	2,552	3,002	7,556
	1914	265	3,128	8,725	1,404	1,393	3,948
	1909	348	3,258	8,682	1,259	1,038	3,342
Tennessee	1919	16	527	1,117	372	451	1,100
	1914	9	432	670	137	108	357
	1909	20	415	608	139	93	323
Texas	1919	7	226	596	227	323	798
	1914	8	262	439	105	115	347
	1909	11	348	534	123	143	390
Utah	1919	12	45	166	63	43	140
	1914	10	49	10	37	19	71
	1909	12	74	20	53	29	115
Vermont	1919	8	160	1,141	158	260	459
	1914	8	132	149	64	98	189
	1909	11	185	248	72	119	250
Virginia	1919	37	750	3,149	587	730	1,875
	1914	34	694	1,729	273	471	995
	1909	35	716	924	232	300	856
Washington	1919	5	150	447	144	146	341
	1914	6	154	384	112	80	250
	1909	12	188	245	126	109	376
West Virginia	1919	9	727	3,700	788	907	2,395
	1914	10	773	4,026	378	434	980
	1909	13	514	1,000	188	224	644
Wisconsin	1919	20	392	2,731	359	417	1,130
	1914	30	828	4,032	450	827	1,570
	1909	43	776	1,984	412	507	1,272
All other states	1919	35	743	2,278	765	1,052	2,316
	1914	48	835	1,928	474	805	1,606
	1909	80	1,214	1,670	535	1,012	2,246

TABLE 63.—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.
1	United States	476	12,855	349	607	325	169	11,405	Se 12,143	Fe 10,370	12,052	11,996	26	30	.....	$45,844,532
2	Alabama	10	531	8	16	12	4	291	De 314	My 282	325	325	.....	.....	.....	1,423,701
3	Arkansas	4	90	1	9	4	.....	76	Mh 86	My 65	88	88	.....	.....	.....	236,939
4	California	8	190	6	13	9	3	159	Ap 178	Oc 141	157	155	2	.....	.....	879,196
5	Connecticut	5	205	.....	9	4	1	191	Jy [2] 199	Mh 178	199	199	.....	.....	.....	946,037
6	Illinois	11	443	11	24	23	7	378	Jy 417	Ja 304	387	386	1	.....	.....	1,542,543
7	Indiana	5	462	8	13	13	9	419	Oc 450	De 346	391	391	.....	.....	.....	967,549
8	Maryland	36	546	31	26	14	7	468	Se 530	Oc 403	489	485	.....	4	.....	813,019
9	Massachusetts	12	543	8	21	10	3	501	No 542	Mh 445	533	531	.....	2	.....	1,254,687
10	Michigan	6	241	2	7	6	4	222	Au 263	Mh 162	227	227	.....	.....	.....	601,900
11	Minnesota	5	198	5	12	8	6	167	Jy 194	Fe 99	184	184	.....	.....	.....	558,447
12	Missouri	16	809	6	35	20	12	736	Oc 853	Ja 610	760	759	1	.....	.....	3,073,677
13	New Jersey	5	21	8	.....	1	.....	12	Ap 16	Fe 7	16	16	.....	.....	.....	41,965
14	New Mexico	4	17	1	2	1	.....	13	No 26	Mh [2] 6	24	24	.....	.....	.....	44,392
15	New York	16	367	9	15	4	4	335	De 400	My 293	391	389	2	.....	.....	1,398,373
16	Ohio	30	1,365	13	68	59	34	1,191	Au 1,315	Fe 958	1,197	1,196	1	.....	.....	6,040,374
17	Pennsylvania	158	2,866	144	118	36	29	2,539	Ap 2,616	Ja 2,440	2,653	2,643	10	.....	.....	8,712,597
18	South Dakota	3	18	1	1	.....	2	14	Au [2] 16	Mh [2] 13	14	14	.....	.....	.....	55,650
19	Tennessee	16	564	15	15	3	4	527	Se 543	Je 494	554	549	.....	5	.....	1,008,500
20	Texas	7	264	7	18	11	2	226	No 319	Ja [2] 171	318	318	.....	.....	.....	808,866
21	Utah	12	63	10	6	2	.....	45	Je [2] 58	Ja 27	48	46	2	.....	.....	479,515
22	Vermont	8	183	6	12	2	3	160	Se 179	Mh 138	166	166	.....	.....	.....	663,341
23	Virginia	37	851	15	57	17	12	750	Ap 854	Fe 684	812	793	.....	19	.....	2,307,420
24	Washington	5	166	.....	10	6	.....	150	No 185	Jy 125	174	172	2	.....	.....	1,170,482
25	West Virginia	9	782	6	18	27	4	727	Fe [2] 755	Oc 697	716	715	1	.....	.....	3,096,561
26	Wisconsin	20	449	5	32	13	7	392	Je 437	Ja 292	373	372	1	.....	.....	2,417,188
27	All other states [3]	28	821	23	50	20	12	716	.....	.....	856	853	3	.....	.....	5,301,613

[1] Includes water wheels and turbines (irrespective of ownership of water supply).
[2] Same number reported for one or more other months.

BY STATES: 1919.

EXPENSES.										POWER.							
Salaries and wages.				Rent and taxes.		For materials.				Primary horsepower.							
											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 (electric).	Electric-horsepower generated in establishments reporting.	
$1,366,422	$629,458	$10,869,196	$70,430	$88,937	$896,563	$8,269,479	$6,027,446	$33,970,403	$19,673,538	51,735	18,732	1,214	2,944	250	28,595	3,560	1
44,202	23,749	304,741	2,271	3,753	19,470	440,329	199,886	1,148,696	508,481	809	250	140	19	.....	400	.....	2
11,870	3,655	54,585	.....	220	1,790	54,724	27,095	187,667	105,848	240	132	.....	108	.....	.....	.....	3
22,835	15,811	169,897	.....	.....	12,681	146,344	134,855	564,152	282,953	345	235	.....	.....	.....	110	5	4
19,723	6,277	196,289	.....	685	17,270	297,602	121,594	770,206	351,010	85	.....	.....	.....	.....	85	.....	5
56,722	34,087	409,141	.....	393	34,970	233,157	97,495	1,064,548	733,896	1,668	370	.....	.....	.....	1,298	.....	6
34,211	26,913	340,817	417	.....	28,921	233,374	154,821	938,723	550,528	1,553	960	.....	14	.....	579	565	7
37,150	16,985	263,424	450	3,372	17,580	372,942	178,394	1,049,265	497,929	2,111	844	.....	168	.....	1,099	.....	8
52,974	23,900	522,624	.....	2,777	69,613	599,854	368,475	2,113,741	1,145,412	2,028	531	.....	135	.....	1,362	60	9
23,150	10,286	183,272	.....	200	11,044	148,596	142,424	625,750	334,730	1,195	1,000	.....	118	.....	77	350	10
32,160	13,620	169,381	.....	250	16,748	77,846	42,073	427,439	307,520	260	200	.....	18	.....	42	30	11
63,309	62,231	649,765	13,441	1,225	51,656	405,472	387,144	2,090,126	1,297,510	1,936	1,515	.....	105	.....	316	235	12
.....	1,020	11,097	.....	100	694	1,747	7,012	26,682	17,023	65	40	.....	.....	.....	25	.....	13
1,245	22	11,155	2,105	30	167	605	3,637	26,822	22,580	.....	.....	.....	.....	.....	.....	.....	14
32,460	8,262	317,489	8,320	.....	30,038	189,522	201,587	832,141	441,032	2,386	1,045	.....	59	.....	1,282	.....	15
182,774	125,265	1,261,937	4,008	178	146,550	954,878	746,122	4,021,106	2,320,106	9,175	2,015	807	775	.....	5,578	1,199	16
298,217	70,109	2,551,699	14,966	47,437	125,326	1,694,476	1,308,014	7,556,372	4,553,882	12,554	4,541	.....	247	30	7,736	968	17
1,891	2,011	17,150	.....	.....	1,179	8,955	15,364	59,475	35,156	55	.....	.....	30	.....	25	.....	18
31,669	7,511	371,802	.....	636	24,548	298,099	152,410	1,099,620	649,111	1,117	993	100	24	.....	.....	.....	19
37,536	17,120	227,206	1,888	300	8,412	189,479	133,581	797,882	474,822	596	535	.....	6	.....	55	10	20
8,100	1,684	62,941	3,502	2,097	2,066	24,691	18,300	139,642	96,651	166	.....	2	124	.....	40	.....	21
19,722	2,835	158,309	1,316	2,381	8,049	98,702	161,257	459,489	199,530	1,141	290	.....	.....	145	706	130	22
121,636	24,025	586,844	2,979	879	64,811	466,197	264,001	1,875,173	1,144,975	3,149	1,399	.....	9	.....	1,741	.....	23
20,585	10,983	144,254	.....	.....	8,408	95,206	51,295	341,361	194,860	447	87	.....	60	.....	300	.....	24
59,865	56,116	788,410	.....	6,940	129,241	502,501	404,419	2,394,667	1,487,747	3,700	30	.....	.....	.....	3,670	.....	25
54,382	19,396	358,643	3,600	2,115	20,155	151,834	264,840	1,130,092	713,418	2,731	1,135	15	846	75	660	8	26
98,034	45,585	736,324	11,107	12,969	45,176	582,347	440,451	2,229,626	1,206,828	2,223	585	150	79	.....	1,409	.....	27

[1] All other states embrace; Arizona, 2 establishments; Colorado, 1; Florida, 2; Idaho, 2; Iowa, 2; Kentucky, 3; Maine, 4; Montana, 2; Nevada, 1; North Carolina, 2; Oklahoma, 2; Oregon, 2; Rhode Island, 1; and Wyoming, 2.