

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 119.

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December 14, 1901.

MANUFACTURES.

MISSISSIPPI.

Hon. WILLIAM R. MERRIAM,
Director of the Census.

SIR: I transmit herewith, for publication in bulletin form, the statistics of manufacturing and mechanical industries for the state of Mississippi for the census year 1900, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that "The schedules of inquiries relating to the products of manufacturing and mechanical establishments shall embrace the name and location of each establishment; character of organization, whether individual, cooperative, or other form; date of commencement of operations; character of business or kind of goods manufactured; amount of capital invested; number of proprietors, firm members, copartners, or officers, and the amount of their salaries; number of employees, and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used; and character and number of machines employed."

In each of the above particulars the requirements of the law have been observed, but certain of the data thus elicited are reserved for publication in the final volumes.

There were 11 cities and towns in the state withdrawn from the enumerators and their manufacturing statistics collected by special agents, in accordance with the further provision of section 7 of the Census Act. Wherever the phrase "urban manufactures" is used in this bulletin, it applies only to those cities and towns which were withdrawn from the enumerators and committed to special agents, and only to manufacturing establishments within the corporate limits of such places.

There is no city in Mississippi with a population of 20,000 or more, and for the Twelfth Census the detailed statistics of cities by industries have been confined to those of that size.

Prof. A. M. Muckenfuss, of Millsaps College, Jackson,

Miss., rendered valuable assistance in the preparation of the text for the accompanying report.

The statistics of Mississippi are presented in 7 tables: Table 1 showing the comparative figures for the state at the several censuses; Table 2 showing all the industries of the state divided between hand trades and the manufactures proper, and also the statistics of eleemosynary institutions, and establishments with a product of less than \$500, which two latter classes were not reported at previous censuses; Table 3 showing the statistics of the 8 leading industries of the state for 1890 and 1900; Table 4 showing the urban manufactures of the state, in comparison with the totals for the entire state and the state exclusive of the cities and towns withdrawn from the enumerators; Table 5 showing the statistics for the state by counties; Table 6 showing the statistics for the state by specified industries; and Table 7 showing the totals for all industries in each of the cities and towns withdrawn from the enumerators.

Table 1 shows the growth of manufactures in Mississippi for the half century which terminates with the Twelfth Census. The manufacturing statistics of the censuses prior to 1850 were too imperfect and fragmentary in character to make it proper to reproduce them in such a table as a measure of industrial growth in the first half of the century. Owing to changes in the method of taking the census, comparisons between the earlier and later decades, represented in Table 1, should be drawn only in the most general way. Nevertheless, the rate of growth in Mississippi manufactures may be fairly inferred from the figures given.

In drafting the schedules of inquiry for the census of 1900 care was taken to preserve the basis of comparison with prior censuses. Comparison may be made safely with respect to all the items of inquiry except those relating to capital, salaried officials, clerks, etc., and their salaries, the average number of employees, and the total amount of wages paid. Live capital, that is, cash on hand,

bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries, was first called for at the census of 1890. No definite attempt was made, prior to the census of 1890, to secure a return of live capital invested.

Changes were made in the inquiries relating to employees and wages in order to eliminate defects found to exist on the form of inquiry adopted in 1890. At the census of 1890 the average number of persons employed during the entire year was called for, and also the average number employed at stated weekly rates of pay, and the average number was computed for the actual time the establishments were reported as being in operation. At the census of 1900 the greatest and least numbers of employees were reported, and also the average number employed during each month of the year. The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month. This difference in the method of ascertaining the average number of wage-earners during the entire year may have resulted in a variation in the number, and should be considered in making comparisons.

At the census of 1890 the number and salaries of proprietors and firm members actively engaged in the business or in supervision were reported, combined with clerks and other officials. In cases where proprietors and firm members were reported without salaries, the amount that would ordinarily be paid for similar services was estimated. At the census of 1900 only the number of proprietors and firm members actively engaged in the industry or in supervision was ascertained, and no salaries were reported for this class. It is therefore impossible to compare the number and salaries of salaried officials of any character for the two censuses.

Furthermore, the schedules for 1890 included in the wage-earning class, overseers, foremen, and superintendents (not general superintendents or managers), while the census of 1900 separates from the wage-earning class such salaried employees as general superintendents, clerks, and salesmen. It is possible and probable that this change in the form of the question has resulted in eliminating from the wage-earners, as reported by the present census, many high-salaried employees included in that group for the census of 1890.

In some instances, the number of proprietors and firm members, shown in the accompanying tables, falls short of the number of establishments reported. This is accounted for by the fact that no proprietors or firm members are reported for corporations or cooperative establishments. The number of salaried officials, clerks, etc., is the greatest number reported employed at any one time during the year. For the cotton-ginning industry, this number may appear excessive as compared with the amount of salaries paid; but allowance should be made for the fact that a considerable number of clerks are employed for only a

part of the year; consequently the amount they receive would be small if reckoned as an annual salary.

The reports show a capital of \$85,807,419 invested in manufactures and mechanical industries in the 4,772 establishments reporting for the state of Mississippi. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations of the state of Mississippi. The value of the products is returned at \$40,431,386, to produce which involved an outlay of \$1,167,020 for salaries of officials, clerks, etc.; \$7,471,886 for wages; \$1,476,855 for miscellaneous expenses, including rent, taxes, etc.; and \$21,692,092 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of products for the state of Mississippi, \$40,431,386, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the values of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

At the census of 1890 the schedule was so framed that it was impossible to find the net or true value. In the present census the schedule asked for the value of the materials in two classes, those purchased in the crude state and those purchased in the partly manufactured form. From the answers to these questions the net or true value of products may be computed. Thus, for Mississippi, the gross value of products for 1900 was \$40,431,386. The value of materials purchased in a partly manufactured form was \$12,618,054. The difference, \$27,813,332, is the net or true value of products, and represents the increase in the value of raw materials resulting from the various processes of manufacture.

Very respectfully,



Chief Statistician for Manufactures.

MISSISSIPPI.

Table 1 shows the manufacturing and mechanical industries of Mississippi as returned at the censuses of 1850 to 1900, inclusive, with the percentages of increase for each decade. This table also presents the average number of wage-earners employed by manufacturing establishments,

in comparison with the total population of the state, and the value of the land and buildings owned and reported by manufacturers as capital, in comparison with the assessed value of all real estate and improvements.

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1880	1880 to 1870	1870 to 1860	1860 to 1850	1850 to 1840
Number of establishments	4,772	1,698	1,479	1,731	976	947	181.0	14.8	114.6	77.4	8.1
Capital	\$35,807,419	\$14,896,884	\$4,727,600	\$4,501,714	\$4,384,492	\$1,815,820	140.4	215.1	5.0	2.7	141.6
Salaried officials, clerks, etc., number	1,569	2,352	(3)	(3)	(3)	(3)	16.1				
Salaries	\$1,167,020	\$792,109	(3)	(3)	(3)	(3)	61.6				
Wage-earners, average number	26,418	14,465	5,827	5,941	4,775	3,154	82.6	148.2	11.9	24.4	51.4
Total wages	\$7,471,886	\$4,191,754	\$1,192,645	\$1,547,428	\$1,618,320	\$771,628	78.3	251.5	122.9	14.4	109.8
Men, 16 years and over	23,643	12,320	4,887	5,500	4,572	3,046	91.9	152.1	111.1	20.3	50.1
Wages	\$7,085,534	\$3,888,250	(3)	(3)	(3)	(3)	89.3				
Women, 16 years and over	1,726	1,286	(3)	(3)	(3)	(3)	108	199.3	116.2	16.9	88.0
Wages	\$314,018	\$261,526	(3)	(3)	(3)	(3)	20.1				
Children, under 16 years	1,049	909	(3)	(3)	(3)	(3)	15.4	72.5	110.8		
Wages	\$122,839	\$91,978	(3)	(3)	(3)	(3)	88.0				
Miscellaneous expenses	\$1,476,855	\$827,627	(4)	(4)	(4)	(4)	78.4				
Cost of materials used	\$21,692,092	\$10,064,897	\$4,667,183	\$4,864,206	\$3,146,636	\$1,275,771	115.5	115.7	6.9	38.7	146.6
Value of products, including custom work and repairing	\$10,431,386	\$18,705,384	\$7,518,302	\$8,154,768	\$6,590,687	\$2,912,068	116.1	148.8	17.8	23.7	126.3
Total population	1,551,270	1,289,600	1,181,597	827,922	791,905	606,526	20.3	14.0	36.7	4.6	80.5
Wage-earners engaged in manufactures	26,418	14,465	5,827	5,941	4,775	3,154	82.6	148.2	11.9	24.4	51.4
Per cent of total population	1.7	1.1	0.5	0.7	0.6	0.5					
Assessed value of real estate	\$158,365,609	\$117,004,402	\$79,469,580	\$118,278,460	\$157,836,737	\$65,171,438	85.4	47.2	132.8	125.1	142.2
Value of land and buildings invested in manufactures ⁶	\$13,169,265	\$4,453,810	(3)	(3)	(3)	(3)	195.7				
Per cent of assessed value	8.3	3.8									

¹ Decrease.

² Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 6.)

³ Not reported separately.

⁴ Not reported.

⁵ As given in the state auditor's Comparative Statement of Assessments for 1900.

⁶ Does not include the value of rented property.

Although Mississippi is an agricultural state, Table 1 shows that there has been a considerable growth in its manufacturing and mechanical industries during the half century. The population during these years increased from 606,526 to 1,551,270, or 155.8 per cent, while the average number of wage-earners employed in manufacturing establishments increased from 3,154 to 26,418, or 737.6 per cent, embracing, in 1900, 1.7 per cent of the entire population, compared with five-tenths of 1 per cent in 1850. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 43,369, or 2.8 per cent of the total population of the state. Measured by the value of products, the greatest percentage of increase, 148.8, was during the decade 1880 to 1890, although the greatest absolute increase was between the years 1890 and 1900.

Mississippi has few of the natural advantages which foster manufactures. It possesses no important harbor, little waterpower, and few mineral resources. The state is fortunate, however, in having cotton lands of inexhaustible fertility and extensive forests of pine and hard wood. Its industrial history dates back to the early years of the century. Among the manufacturing establishments re-

ported at the census of 1810 were 22 cotton factories, 10 tanneries, and 6 distilleries. At the census of 1840 there were reported 53 cotton factories with a total of 318 spindles, 128 tanneries, 14 distilleries, and 16 flouring mills. With the opening of the Chickasaw Cession to settlement in 1832, a period of gigantic speculation began.¹ No state "plunged more boldly into corrupt banking systems, and none suffered more disastrous consequences." Here, as in other states, this period of excessive speculation terminated in the financial panic of 1837. Repudiation of bonds followed in 1842. Confidence in the general policy and laws of Mississippi was destroyed. The census of 1850 shows only 3,154 persons engaged in manufactures, compared with 5,060 in 1840. In 1860 the state had, to a large extent, recovered from the speculative influences of these earlier years, and was experiencing its first genuine industrial development. The increase in the value of products during the decade ending with that year was 126.3 per cent. The industrial stagnation throughout the South during the next twenty years is well known, but with 1880 a new period of growth began. Between 1880 and 1890 great efforts were made to attract manufacturers.

¹ Industrial Resources of the South and West, by DeBow, Vol. II, page 14.

A bureau of immigration was organized, and in 1882 the legislature passed an act exempting machinery of factories from taxation for ten years.

Table 2 divides the industries of the state between the hand trades and the manufactures proper. This table also

gives the statistics for eleemosynary institutions, and establishments with a product of less than \$500; these were not reported at previous censuses, and therefore are omitted from the other tables and their use confined to Table 2.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

CLASSES.	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	COST OF MATERIALS USED.				Value of products, including custom work and repairing.
				Average number.	Total wages.		Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	
Total	9,432	\$37,547,882	10,160	32,206	\$7,577,894	\$1,516,342	\$21,959,861	\$8,049,358	\$12,821,425	\$1,089,083	\$41,311,374
Hand trades ¹	843	954,599	952	1,518	560,824	84,212	1,272,502	1,498	1,219,322	51,632	2,622,046
Eleemosynary institutions	4	42,500		21	2,199	1,811	3,676		2,587	1,089	13,912
Establishments with a product of less than \$500	4,656	1,637,963	4,765	5,767	103,809	38,146	264,093	63,809	200,784		866,076
All other establishments	3,929	34,852,820	4,443	24,900	6,911,062	1,392,643	20,419,590	7,984,546	11,398,732	1,036,312	37,809,340

¹ Includes bicycle and tricycle repairing, 12; blacksmithing and wheelwrighting, 362; boots and shoes, custom work and repairing, 55; carpentering, 68; clothing, men's, custom work and repairing, 42; clothing, women's, dressmaking, 21; dyeing and cleaning, 6; furniture, cabinetmaking, repairing, and upholstering, 12; lock and gun smithing, 12; masonry, brick and stone, 8; millinery, custom work, 119; painting, house, sign, etc., 23; paper hanging, 1; plastering and stuccowork, 2; plumbing, and gas and steam fitting, 18; sewing machine repairing, 1; watch, clock, and jewelry repairing, 76.

Of the 9,432 establishments of all classes, shown in this table, 5,499, or 58.3 per cent, were small shops included in the groups of "hand trades" and "establishments with a product of less than \$500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to

\$3,488,122, or only 8.4 per cent of the total value of the products of the state.

In addition to the 9,432 active establishments in the state during the census year, with a capital of \$37,547,882, shown in Table 2, there were 68 idle establishments, with a capital of \$68,677, divided as follows:

INDUSTRIES.	Number of idle establishments.	Capital.	INDUSTRIES.	Number of idle establishments.	Capital.
Brick and tile	2	\$2,200	Hosiery and knit goods	1	\$7,000
Carriage and wagon materials	1	1,706	Lumber, planing mill products, including sash, doors, and blinds	1	2,500
Cheese, butter, and condensed milk, factory product	1	2,525	Pottery, terra-cotta, and fire-clay products	1	7,919
Cotton, ginning	40	40,217	All other industries	19	1,200
Flouring and grist mill products	2	3,410			

TABLE 3.—COMPARATIVE SUMMARY OF EIGHT LEADING INDUSTRIES.

INDUSTRIES.	Year.	Number of establishments.	Capital.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
				Average number.	Total wages.			
Total for selected industries for state	1890 1890	3,205 903	\$29,210,084 9,794,213	20,072 9,584	\$5,474,122 2,602,583	\$1,045,899 508,159	\$17,621,763 7,325,505	\$31,372,442 12,633,634
Increase, 1890 to 1900		2,242	19,415,871	10,488	2,871,539	537,740	10,296,258	18,733,908
Per cent of increase		232.8	198.2	109.4	110.3	105.8	140.6	148.2
Per cent of total of all industries in state	1900 1890	67.2 56.7	81.6 65.7	76.0 66.3	73.3 62.1	70.8 61.4	81.2 72.8	77.6 67.6
Cars and general shop construction and repairs by steam railroad companies.	1900 1890	9 5	741,753 612,744	1,534 1,076	807,899 677,033	18,336	464,034 632,876	1,326,401 1,329,649
Cotton, ginning ¹	1900 1890	1,901 130	3,553,853 211,829	2,422 547	281,803 48,499	69,882 7,961	667,654 28,647	2,214,949 130,387
Cotton goods	1900 1890	6 9	2,209,749 2,058,743	1,675 1,154	339,546 263,997	117,117 57,622	767,327 871,970	1,472,835 1,333,398
Flouring and grist mill products	1900 1890	225 468	225,395 652,663	208 777	27,244 38,650	3,802 25,002	805,894 1,009,335	932,316 1,249,669
Lumber and timber products	1900 1890	844 366	17,337,588 4,498,738	9,676 4,427	2,790,780 1,169,673	448,710 216,482	3,422,253 2,867,798	15,656,110 5,770,387
Lumber, planing mill products, including sash, doors, and blinds	1900 1890	34 3	631,553 93,002	748 92	235,083 42,690	32,256 4,584	344,248 59,170	1,315,775 136,450
Oil, cottonseed and cake	1900 1890	41 13	3,711,930 1,497,746	1,521 891	461,357 211,139	337,141 186,754	4,952,814 1,767,307	6,681,121 2,406,628
Turpentine and rosin	1900 1890	145 24	798,373 173,698	2,288 620	530,410 106,442	18,655 9,754	997,539 102,002	1,772,435 282,066

¹ Does not include many gineries operated in connection with saw, grist, and cottonseed oil mills, or for the use exclusively of plantations on which they are located. For the full number of gineries in operation reference should be made to the special report on cotton ginning.

The 8 leading industries of the state in 1900, as shown in Table 3, embraced 3,205 establishments, or 67.2 per cent of the total number in the state; used a capital of \$29,210,084, or 81.6 per cent of the total; gave employment to 20,072 wage-earners, or 76 per cent of the total number; and paid \$5,474,122, or 73.3 per cent of the total wages. The value of their products was \$31,372,442, or 77.6 per cent of the total. In the discussion of Table 3, which follows, these industries are ranked with reference to the value of their products.

Table 3 shows that the manufacture of lumber and timber products is the most important industry in the state. The 844 establishments reported in 1900 gave employment to 9,676 wage-earners, or 36.6 per cent of the wage-earners employed in the state, and the products were valued at \$15,656,110, or 38.7 per cent of the total value of the products of the state. In 1890 there were 366 establishments, 4,427 wage-earners, and products valued at \$5,770,387. The increase in the value of products during the decade was 171.3 per cent. The forests of Mississippi constitute its most valuable natural resource. The long-leaf pine region of the coastal plain no longer contains much valuable timber, but the rolling pine lands of the interior have been very little exploited. These in 1897 were estimated to cover 7,712,000 acres. The lumber industry is carried on chiefly along the Pascagoula River in the southeast, and in Hancock county in the southwest.¹

The manufacture of cottonseed oil and cake ranks second, with 41 establishments, 1,521 wage-earners, and

products valued at \$6,681,121. In 1890 there were 13 establishments, 891 wage-earners, and products valued at \$2,406,628. The increase in the value of products during the decade was 177.6 per cent. In 1900, Meridian had the mill of largest capacity, and Greenville the greatest number of establishments. Two establishments, one at Jackson and the other at Meridian, refined as well as expressed the oil. It is claimed that a Mississippian, John Ross, in 1801 made the first written suggestion that oil be expressed from the cottonseed and prophetically named its uses.² The first mill in the United States was erected at Natchez, Miss., in 1834,³ and at the census of 1870, 4 mills were reported in the state.

Cotton ginning has undergone a remarkable development during the last decade and now holds third place among the manufacturing industries of the state. There were 1,901 establishments reported in 1900, with 2,422 wage-earners, and the receipts for ginning and other work done amounted to \$2,214,949. In 1890 there were only 130 establishments reported, with 547 wage-earners, and the receipts for ginning and other work done amounted to \$130,387. The increase in these receipts during the decade was \$2,084,562, or 1,598.7 per cent. These figures do not include the operation of many private plantation gineries, or gineries connected with saw, grist, or cottonseed oil mills. For the full number of gineries in operation reference should be made to the special report on cotton ginning.⁴

¹ United States Department of Agriculture, Bulletin No. 13 (Revised edition), 1897, page 42.

² History of Mississippi, by Lowry and McCardle, page 137.

³ Cotton and Cotton Oil, by D. A. Tompkins, page 210.

⁴ See special report on Cotton Ginning.

There were 145 establishments engaged in the manufacture of turpentine and rosin in 1900, with 2,288 wage-earners, and products valued at \$1,772,435. In 1890, 24 establishments were reported, with 620 wage-earners, and products valued at \$282,066. The increase in the value of products during the decade was 528.4 per cent. In 1860 there was but 1 turpentine still in the state, while in 1880, 11 were reported.

There were 6 establishments engaged in the manufacture of cotton goods in 1900, with 1,675 wage-earners, and products valued at \$1,472,835. In 1890, 9 establishments were reported, with 1,154 wage-earners, and products valued at \$1,333,398. The increase in the value of products during the decade was 10.5 per cent. In 1850 there were 2 mills in the state, with products valued at but \$30,500.¹ In 1870 the establishments reported numbered 5, and the value of products was \$234,445. The 8 mills in operation in 1880 reported products valued at \$679,093.¹ During the decade, 1870 to 1880, a cotton mill was established, which in 1892 had become what was claimed to be the largest plant of its kind in the South.²

There were 9 establishments engaged in the construction and general shop work of steam railroad companies in 1900, with 1,534 wage-earners, and products valued at \$1,326,401. In 1890, 5 establishments were reported, with 1,076 wage-earners, and products valued at \$1,329,549. The decrease in the value of products during the decade

¹ Report on Manufacturing Industries at the Eleventh Census, pages 190 and 191.

² Where to Locate New Factories, by the Illinois Central Railroad, page 101.

was two-tenths of 1 per cent. The first railroad shops in the state were those of the West Feliciana Railroad, at Woodville.³ The largest and most complete plant in the state is said to be at McComb City. Five of the establishments reported, both for 1890 and for 1900, are all large, but the 4 additional shops reported for 1900 are comparatively small, having been erected by short-line railroads or at convenient junction points.

There were 34 establishments engaged in the manufacture of planing mill products in 1900, with 748 wage-earners, and products valued at \$1,315,775. In 1890, 8 establishments were reported, with 92 wage-earners, and products valued at \$136,450. The increase in the value of products during the decade was 864.3 per cent.

There were 225 establishments engaged in flour and grist milling in 1900, with 208 wage-earners, and products valued at \$932,816. In 1890, 408 establishments were reported, with 777 wage-earners, and products valued at \$1,249,669. The decrease in the value of products during the decade was 25.4 per cent.

URBAN MANUFACTURES.

Table 4 presents the totals for the manufacturing industries of the 11 cities and towns withdrawn from the enumerators, places them in comparison with the totals for the entire state and the state exclusive of these cities and towns, and shows their rank in population and in value of products.

³ Memoirs of Mississippi, Vol. II, page 87.

TABLE 4.—URBAN MANUFACTURES.

	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	PRODUCTS.			POPULATION.		
				Average number.	Total wages.			Value.	Rank.	Per cent of total.	Total.	Rank.	Per cent of total.
Total for state.....	4,772	\$85,807,419	5,395	26,418	\$7,471,886	\$1,476,855	\$21,692,092	\$40,431,386	-----	100.0	1,551,270	-----	100.0
Total for urban manufactures.....	533	8,008,580	565	6,389	2,185,373	556,103	6,404,513	11,441,551	-----	28.3	74,014	-----	4.8
Aberdeen.....	82	179,625	87	194	40,229	10,765	119,914	228,278	10	0.6	3,434	8	0.2
Biloxi.....	39	417,902	40	593	136,441	32,022	605,663	949,031	5	2.3	5,497	6	0.4
Columbus.....	57	610,431	59	634	138,639	85,912	382,498	753,599	7	1.9	6,484	5	0.4
Corinth.....	38	441,689	41	476	151,657	27,875	383,877	759,542	6	1.9	8,661	7	0.2
Handshoro.....	5	155,221	5	133	84,280	4,070	127,833	213,844	11	0.5	840	11	0.1
Jackson.....	83	958,508	96	735	263,645	84,053	1,075,845	1,724,355	3	4.3	7,816	4	0.5
Meridian.....	119	1,923,590	126	1,416	555,409	131,938	1,709,655	2,980,217	1	7.4	14,050	2	0.9
Natchez.....	48	1,389,691	46	746	209,556	180,764	704,037	1,270,855	4	8.1	12,210	3	0.8
Scranton.....	15	372,655	15	167	66,045	6,532	173,319	326,114	9	0.8	2,025	10	0.1
Vicksburg.....	65	1,360,890	69	1,222	582,734	81,040	943,387	1,876,843	2	4.6	14,334	1	1.0
West Point.....	32	198,328	31	173	56,738	11,132	193,490	358,863	8	0.9	3,193	9	0.2
Total for state exclusive of urban manufactures.....	4,239	27,803,889	4,830	20,029	5,286,513	920,752	15,287,574	28,989,835	-----	71.7	1,477,256	-----	95.2
Per cent of urban manufactures to total for state.....	11.2	22.4	10.5	24.2	29.2	37.7	29.5	28.3	-----	-----	4.8	-----	-----

Of the 4,772 establishments in the state, 533, or 11.2 per cent, were located in these 11 cities and towns. They furnished employment to 6,389 wage-earners, or 24.2 per cent of the total number, and the value of their products, \$11,441,551, formed 28.3 per cent of the total for the state.

Table 5 shows the totals for the state by counties.

Table 6 shows the totals for the state by specified industries.

Table 7 shows the totals for the cities and towns withdrawn from the enumerators.

TABLE 5.—MANUFACTURES

COUNTIES.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
1 The State.....	4,772	\$85,807,419	\$8,671,109	\$4,498,156	\$18,077,469	\$9,560,685	5,395	1,569	\$1,167,020	26,418	\$7,471,886
2 Adams.....	80	1,474,448	161,963	237,326	633,405	441,754	82	61	89,671	811	222,522
3 Alcorn.....	66	645,635	39,910	65,726	143,345	306,654	76	41	48,740	598	187,167
4 Amite.....	69	142,919	13,397	32,250	63,622	83,650	69	4	1,800	143	29,096
5 Attala.....	89	185,275	12,480	24,080	73,840	24,875	105	3	3,760	181	35,271
6 Benton.....	29	37,605	8,795	5,375	24,005	3,730	36	1	50	37	6,068
7 Bolivar.....	117	407,508	75,539	66,210	188,069	77,690	116	27	12,509	383	94,738
8 Calhoun.....	47	95,154	19,476	8,780	47,898	19,055	64	1	100	79	11,042
9 Carroll.....	45	80,050	7,755	15,145	51,235	5,915	55	4	300	69	9,043
10 Chickasaw.....	53	72,620	5,551	11,720	46,346	9,003	63	1	420	78	11,556
11 Choctaw.....	47	83,112	13,052	8,780	47,833	13,497	60	4	615	102	20,804
12 Claiborne.....	42	559,411	23,299	113,442	272,402	150,268	40	24	18,076	197	77,204
13 Clarke.....	60	977,535	30,437	170,078	395,360	331,660	68	33	25,335	575	118,217
14 Clay.....	70	268,201	33,828	51,480	112,049	70,344	76	15	10,047	223	65,213
15 Coahoma.....	78	330,481	245,672	120,436	294,560	169,813	80	33	22,571	475	139,944
16 Copiah.....	137	1,159,214	63,679	261,310	469,630	884,095	134	35	42,488	1,287	258,824
17 Covington.....	42	276,621	131,093	26,579	76,259	42,585	59	17	11,342	294	80,399
18 De Soto.....	61	193,477	49,657	25,230	95,375	23,215	63	4	375	125	23,000
19 Franklin.....	33	33,600	8,970	33,075	6,470	37	6	631	114	27,161	
20 Greene.....	25	132,733	55,330	14,650	55,090	57,163	31	14	7,760	232	69,292
21 Grenada.....	47	233,727	46,227	127,260	49,035	61	11	7,675	133	36,756	
22 Hancock.....	40	1,989,327	963,169	87,364	397,776	536,618	44	76	60,760	1,077	270,858
23 Harrison.....	99	1,494,229	440,047	141,334	400,077	512,719	118	81	60,414	1,577	427,173
24 Hinds.....	136	1,192,758	103,919	203,458	508,247	367,134	205	100	66,774	944	310,215
25 Holmes.....	57	270,930	36,935	52,059	143,561	88,375	63	21	17,233	214	43,646
26 Issaquena.....	38	174,390	37,665	23,370	67,705	40,150	35	7	4,714	66	13,989
27 Itawamba.....	27	63,452	13,915	7,190	28,445	13,902	33	—	—	53	10,240
28 Jackson.....	78	2,383,413	335,412	149,395	519,210	878,896	91	92	60,334	1,329	424,513
29 Jasper.....	32	44,024	9,469	6,510	23,845	4,200	37	—	—	23	4,541
30 Jefferson.....	55	147,929	7,571	46,327	78,253	15,278	57	8	2,306	84	15,935
31 Jones.....	54	2,050,668	753,682	119,342	643,620	533,424	60	57	65,132	1,143	350,114
32 Kemper.....	47	81,475	23,025	11,260	40,545	6,645	53	3	750	93	14,633
33 Lafayette.....	71	139,115	43,208	14,430	55,097	20,780	94	1	500	110	17,140
34 Lauderdale.....	194	2,123,954	235,377	307,914	955,949	629,714	227	74	77,951	1,639	613,112
35 Lawrence.....	43	50,061	5,653	13,025	35,000	4,733	61	—	—	77	13,075
36 Leake.....	43	84,501	14,270	11,125	54,366	4,740	56	—	—	69	9,278
37 Lee.....	75	297,376	112,490	34,945	124,881	25,560	101	10	5,475	175	40,195
38 Leflore.....	97	630,005	33,510	113,155	296,850	136,490	107	46	32,206	363	94,817
39 Lincoln.....	89	1,605,300	616,055	85,105	501,676	273,464	88	60	60,140	997	231,103
40 Lowndes.....	103	684,696	73,593	162,351	279,331	179,413	105	31	19,377	533	145,733
41 Madison.....	75	179,315	12,280	33,300	96,450	32,235	78	19	9,370	147	34,200
42 Marion.....	43	132,538	30,123	19,030	54,435	28,345	52	8	3,630	260	68,322
43 Marshall.....	98	151,423	10,233	21,640	76,393	43,112	109	15	4,943	161	39,436
44 Monroe.....	91	711,161	75,614	85,518	198,097	351,332	100	28	16,394	500	126,435
45 Montgomery.....	61	133,707	17,236	32,610	93,870	34,941	72	19	12,301	206	57,438
46 Neshoba.....	23	31,740	2,310	4,320	23,555	1,555	34	—	—	27	3,662
47 Newton.....	63	162,102	39,329	20,749	77,007	24,517	76	1	80	172	44,141
48 Noxubee.....	73	122,898	12,905	17,035	73,733	14,175	89	5	975	149	24,044
49 Oktibbeha.....	59	162,025	44,177	14,378	68,180	34,730	64	5	1,025	106	21,477
50 Panola.....	85	129,970	10,795	23,930	73,235	17,170	92	14	1,168	110	16,391
51 Pearl River.....	32	1,040,015	590,791	45,043	259,633	144,543	34	36	33,330	697	200,646
52 Perry.....	50	936,922	365,611	83,015	304,651	228,645	66	37	23,529	842	228,154
53 Pike.....	73	1,795,432	633,576	175,348	492,013	429,045	85	53	44,033	1,233	433,555
54 Pontotoc.....	55	69,132	7,693	3,675	41,593	11,166	64	2	70	53	7,357
55 Prentiss.....	50	94,574	4,392	9,255	46,832	34,011	66	1	780	143	23,830
56 Quitman.....	13	66,653	8,737	6,110	24,706	28,050	9	2	608	24	3,374
57 Rankin.....	44	85,636	20,194	10,165	47,430	7,347	49	2	630	84	18,372
58 Scott.....	23	85,570	26,135	9,200	42,315	7,770	39	5	4,140	59	12,695
59 Sharkey.....	44	166,041	51,975	31,230	69,350	3,436	43	10	2,028	62	12,939
60 Simpson.....	27	63,935	10,530	11,645	33,910	7,850	32	3	1,314	73	20,207
61 Smith.....	46	66,914	8,243	7,724	41,470	9,477	64	2	220	57	7,796
62 Sunflower.....	44	617,659	210,960	41,335	125,634	239,630	46	20	15,796	342	87,936
63 Tallahatchie.....	49	210,025	69,910	26,255	87,545	26,315	55	4	2,250	93	27,002
64 Tate.....	69	155,590	13,335	23,090	47,940	66,175	33	5	2,380	136	36,200
65 Tippah.....	45	56,730	6,385	7,790	33,235	9,010	72	3	1,110	71	14,424
66 Tishomingo.....	31	34,659	4,639	3,700	24,030	2,340	33	1	300	43	6,903
67 Tunica.....	44	252,343	111,470	26,340	94,490	20,043	60	5	3,750	125	33,132
68 Union.....	45	89,976	16,790	11,905	43,050	13,141	65	2	724	94	18,360
69 Warren.....	133	1,032,505	134,730	302,200	600,925	594,950	141	94	35,333	1,490	597,532
70 Washington.....	123	1,391,968	250,368	223,639	553,457	304,504	104	84	57,017	592	196,850
71 Wayne.....	55	237,634	32,959	21,394	130,933	61,343	54	17	16,355	353	80,646
72 Webster.....	57	97,903	20,335	8,075	53,327	16,171	73	1	367	105	18,637
73 Wilkinson.....	40	89,247	10,672	25,250	49,400	3,925	46	3	707	53	9,232
74 Winston.....	30	49,074	3,275	3,190	34,175	3,434	35	—	—	36	4,999
75 Yalobusha.....	57	325,629	57,910	53,745	130,254	33,720	63	11	7,736	474	179,973
76 Yazoo.....	127	637,913	63,221	137,992	353,724	132,976	123	41	30,501	404	85,422

BY COUNTIES: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	1
Men, 18 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
23,643	\$7,035,534	1,726	\$314,013	1,049	\$122,839	\$1,470,855	\$121,163	\$253,157	\$1,088,114	\$14,421	\$21,692,092	\$21,117,554	\$574,538	\$40,481,886	1
557	172,306	103	32,156	91	18,000	133,162	5,484	14,622	112,981	75	718,172	689,921	28,251	1,322,171	2
465	108,163	126	17,280	17	1,724	29,331	2,122	3,337	23,262	610	462,743	466,636	6,047	878,236	3
133	27,046	9	1,900	1	150	3,895	340	785	2,670	100	60,966	58,463	2,503	145,762	4
169	34,083	4	593	8	595	5,781	1,375	1,339	2,627	440	77,870	74,172	3,698	185,300	5
37	5,063					381	10	226	155		28,147	27,562	585	47,675	6
383	94,793					11,687	989	1,364	9,334		222,075	214,858	7,222	541,937	7
77	10,592			2	450	1,013		698	315		25,044	25,044	1,142	71,428	8
68	8,913			1	180	1,114		378	686		16,232	14,338	1,894	49,852	9
72	10,630	1	241	5	685	2,931		773	694	196	20,559	17,043	3,516	68,918	10
98	20,244	1	200	3	300	2,354	410	721	1,223		52,063	51,184	879	111,391	11
194	76,129	2	1,000	1	75	25,166	1,157	4,342	19,467	200	464,051	436,415	27,636	651,324	12
257	63,794	198	36,250	120	13,173	20,653	350	2,496	17,316	461	381,235	368,452	2,783	692,882	13
221	63,863	3	815	4	535	12,694	1,789	3,991	6,839	75	230,387	220,619	9,768	440,035	14
475	139,944					30,711	472	6,009	24,230		483,119	464,203	18,916	831,979	15
675	168,640	385	66,135	227	24,049	63,136	1,056	11,144	50,936		605,674	572,123	33,551	1,077,987	16
293	80,099	1	300			3,271	159	977	2,135		124,998	123,667	1,331	336,878	17
124	22,900	1	100			4,208	196	1,226	2,786		70,822	67,354	3,468	162,564	18
114	27,161					1,148		688	510		65,759	64,239	1,520	127,340	19
232	69,292					4,251		222	1,063		94,424	92,734	1,690	243,340	20
127	34,800	6	1,950			16,812	2,062	2,676	12,037	37	138,772	138,108	6,664	255,202	21
915	252,748	91	9,800	71	8,310	50,902	385	5,092	44,475		746,710	741,703	5,007	1,446,344	22
1,172	373,899	270	33,365	185	14,909	20,653	4,516	7,329	41,124		1,334,412	1,315,869	12,543	2,310,624	23
858	289,533	66	17,918	20	2,764	89,238	11,870	15,290	55,222	6,856	1,172,199	1,132,855	39,344	1,960,562	24
210	42,839	3	650	1	157	3,169	602	2,652	4,715	200	118,334	112,760	5,574	256,369	25
66	13,989					2,896	220	1,126	1,560		49,393	47,471	1,922	119,363	26
51	10,050			2	190	813	54	352	407		36,839	36,298	541	63,694	27
1,308	422,177	5	463	16	1,868	40,016	2,960	7,230	29,318	468	943,967	931,667	9,300	1,937,702	28
28	4,641					578	20	287	271		15,235	14,355	880	35,044	29
33	15,737	1	173			2,339	455	1,158	1,201	25	71,570	66,639	4,931	128,990	30
1,133	347,448	1	160	14	2,506	73,398	448	8,643	64,307		1,206,849	1,201,056	5,793	2,037,650	31
93	13,888	3	500	2	300	1,221	52	516	633	20	35,157	34,887	270	86,007	32
102	15,947	7	1,143	1	50	3,090	996	898	1,196		64,183	62,237	1,946	138,552	33
1,404	582,291	97	23,946	78	6,875	137,163	13,462	22,105	101,014	582	1,818,306	1,770,423	47,883	3,292,923	34
73	12,800			4	275	1,560	21	462	636		24,528	23,439	1,089	63,975	35
69	9,278					1,703	100	400	1,143		32,203	30,869	1,334	62,069	36
166	38,010	7	1,985	2	200	5,496	1,092	1,544	2,760	100	143,854	136,771	7,083	277,465	37
363	94,817					33,963	2,474	5,625	30,894		574,956	554,804	20,652	938,799	38
974	277,293	14	2,630	9	1,120	54,702	2,410	14,646	37,611		962,339	937,153	5,206	1,767,239	39
477	125,317	74	17,051	32	3,365	37,239	5,616	5,152	25,501	1,030	404,227	389,749	23,478	806,580	40
141	33,383	2	380	4	437	10,290	1,607	1,050	6,538	1,100	102,561	95,255	7,306	233,732	41
258	63,037			2	285	2,311	107	971	1,233		182,004	181,269	735	379,178	42
146	35,666	11	2,585	4	185	5,816	1,333	1,315	3,168		77,539	77,122	417	192,903	43
478	121,160	16	4,000	11	1,325	13,230	2,939	3,150	12,021	120	322,251	313,085	9,166	665,990	44
196	55,538	2	750	8	1,200	11,983	440	1,729	9,814		180,131	169,513	10,617	361,223	45
26	3,627			1	35	512		247	265		10,674	9,924	750	27,573	46
169	43,492	1	400	2	249	3,631	225	1,132	2,174	150	130,085	128,537	1,548	285,297	47
123	21,019	9	1,000	17	1,425	3,699	1,742	789	1,138		61,833	57,776	4,057	133,820	48
102	20,932	2	400	2	145	3,203	757	843	1,605		68,308	65,942	2,366	149,677	49
99	15,596	7	1,010	4	235	5,985	816	995	4,574	600	49,086	45,169	3,917	118,165	50
695	200,352			2	294	13,114	803	7,259	5,052		432,527	431,632	895	874,579	51
836	227,225	2	440	4	489	42,454	417	5,738	36,299		679,351	675,058	4,293	1,185,860	52
1,186	476,901	9	2,272	38	4,382	62,041	1,682	8,105	52,194		783,692	770,867	12,825	1,553,413	53
49	6,546	2	565	2	246	1,036	227	612	117		26,947	25,030	1,917	62,008	54
133	23,222	4	560	1	48	2,921	806	743	1,372		80,435	78,465	1,970	178,502	55
24	3,374					436		260	176		10,911	10,368	543	30,004	56
81	13,517			3	355	1,002	101	455	371	75	44,418	43,001	1,417	103,652	57
57	11,975	1	620	1	200	1,123	36	440	623	23	44,461	43,838	623	86,047	58
60	12,727	1	180	1	52	1,997	96	1,079	822		45,596	43,320	2,206	115,021	59
78	20,207					1,168		458	1,010		64,311	63,090	1,221	121,274	60
53	7,371			4	425	1,118	45	452	321		47,135	45,914	1,221	80,672	61
337	86,855	3	821	2	260	32,866	3,039	3,433	26,394		353,655	350,937	2,718	617,202	62
97	20,942			1	120	1,760	250	1,231	279		74,916	72,151	2,765	138,610	63
123	34,005	3	2,015	4	270	4,730	1,125	795	2,810		145,476	141,347	4,129	247,260	64
66	13,674	3	550	2	200	1,906	402	543	556		38,667	37,950	687	90,777	65
42	6,853			1	50	846	36	241	494	75	42,373	41,798	575	64,432	66
124	32,967	1	165			3,809	37	1,574	2,198		147,312	142,219	5,093	255,522	67
93	13,760			1	100	3,121	719	754	1,637	20	63,862	61,770	2,092	131,304	68
1,413	584,539	69	11,423	13	1,630	89,037	22,029	17,629	40,409		1,302,207	1,253,401	48,806	2,404,737	69
378	192,966	7	2,885	7	999	94,400	6,430	14,323	73,616	35	744,579	715,706	28,873	1,473,739	70
352	79,366	1	100	5	680	16,414	334	2,730	13,140	150	341,610	339,236	2,374	434,034	71
100	17,789	3	718	2	180	2,212	233	773	1,201		58,557	57,137	1,420	147,332	72
53	9,232			1	75	1,477	35	638	669	25	21,198	19,104	2,094	6	

TABLE 6.—MANUFACTURES BY

MANUFACTURING AND MECHANICAL INDUSTRIES.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
1 All industries.....	4,772	\$35,807,419	\$8,671,109	\$4,498,156	\$13,077,469	\$9,560,685	5,395	1,560	\$1,167,020	26,418	\$7,471,886
2 Agricultural implements.....	3	53,875	6,025	4,800	16,500	26,550	5	2	1,350	19	4,000
3 Bicycle and tricycle repairing.....	12	9,027	250	75	8,830	4,872	18			9	2,480
4 Blacksmithing and wheelwrighting.....	362	240,673	87,915	51,906	71,993	78,859	408	1	1,010	245	69,882
5 Boots and shoes, custom work and repairing.....	55	17,954	2,250	4,140	4,787	6,827	54			24	8,627
6 Boxes, wooden packing.....	4	51,525	7,700	10,000	18,400	15,425	4	3	1,800	82	24,104
7 Bread and other bakery products.....	22	56,520	11,400	13,550	9,475	22,095	23	2	1,520	67	26,913
8 Brick and tile.....	74	494,524	71,664	164,285	117,123	141,472	94	38	20,322	908	200,916
9 Brooms and brushes.....	8	3,885	810	800	475	1,800	5			10	1,878
10 Carpentering.....	63	172,987	10,590	16,375	23,042	122,080	79	10	7,760	496	226,405
11 Carriage and wagon materials.....	10	92,299	2,275	9,100	37,150	43,774	16	5	3,100	121	46,479
12 Carriages and wagons.....	30	96,525	12,900	20,020	17,810	45,795	34	4	3,500	113	43,552
13 Cars and general shop construction and repairs by steam railroad companies.....	9	741,753	52,692	230,775	251,529	206,757		45	40,754	1,534	807,899
14 Charcoal.....	13	490		150	90	250	15			3	548
15 Clothing, men's, custom work and repairing.....	42	73,355	5,100	2,750	8,320	57,185	46	4	1,800	157	63,708
16 Clothing, women's, dressmaking.....	21	11,267	690	3,400	1,580	5,597	21	3	535	50	13,344
17 Confectionery.....	17	78,715	5,950	21,800	27,465	23,500	19	15	7,290	78	21,439
18 Cotton, compressing.....	23	830,454	101,200	194,550	482,000	52,704		82	60,675	333	107,074
19 Cotton, ginning ¹	1,901	3,553,853	154,409	312,247	2,470,979	116,218	2,070	215	26,870	2,422	281,803
20 Cotton goods.....	6	2,209,749	46,014	438,105	1,050,065	674,965	2	46	60,212	1,675	339,545
21 Druggists' preparations, not including prescriptions.....	3	3,650			150	3,500	3			4	845
22 Dyeing and cleaning.....	6	1,375	50	10	710	605	7			4	1,184
23 Fertilizers.....	3	353,497	17,322	40,000	57,162	239,013		15	13,650	94	32,800
24 Fish, canning and preserving.....	4	122,580	4,362	9,003	12,628	96,587	1	9	7,600	231	41,028
25 Flouring and grist mill products.....	225	225,835	21,026	51,610	126,096	26,603	257	8	1,745	208	27,244
26 Foundry and machine shop products.....	30	890,008	40,460	47,955	122,242	179,351	27	24	31,360	341	159,193
27 Furniture, cabinetmaking, repairing, and upholstering.....	12	10,935	1,025	1,525	3,310	5,075	13			12	4,184
28 Gas, illuminating and heating.....	5	421,988	26,000	53,500	816,089	25,499		11	10,548	24	9,164
29 Ice, artificial.....	21	579,356	92,360	92,500	859,400	35,096	12	26	23,330	164	54,842
30 Leather, tanned, curried, and finished.....	4	2,460	140	570	405	1,315	6			1	240
31 Lock and gun smithing.....	12	6,385		600	4,570	1,315	13			4	1,540
32 Lumber and timber products.....	844	17,337,538	7,229,835	889,867	4,570,609	4,647,237	1,099	465	406,302	9,676	2,790,730
33 Lumber, planing mill products, including sash, doors, and blinds.....	34	631,553	56,910	69,830	156,272	348,541	41	49	43,710	748	235,083
34 Masonry, brick and stone.....	3	15,590	300	400	1,215	13,675	10			148	33,326
35 Mattresses and spring beds.....	5	4,505	300	1,000	205	3,000	7			11	2,988
36 Millinery, custom work.....	119	157,918	8,770	29,325	4,328	114,495	143	10	3,050	154	39,687
37 Mineral and soda waters.....	15	167,941	101,100	9,300	42,925	14,616	14	6	3,100	66	21,362
38 Monuments and tombstones.....	12	44,210	7,500	2,530	1,900	31,980	12	12	3,800	52	25,032
39 Oil, cottonseed and cake.....	41	3,711,930	203,545	780,100	1,857,985	864,330	12	199	211,475	1,521	461,357
40 Oysters, canning and preserving.....	4	205,540	17,600	42,000	31,000	115,049	5	7	9,300	419	31,954
41 Painting, house, sign, etc.....	28	20,528	4,450	6,000	3,928	6,150	32	1	1,200	90	39,036
42 Photography.....	33	41,633	4,325	6,900	17,195	13,213	45	1	420	17	7,087
43 Plumbing, and gas and steam fitting.....	18	96,900	7,200	13,300	8,200	62,700	25	3	2,566	89	36,625
44 Pottery, terra cotta, and fire-clay products.....	4	11,690	700	3,600	2,180	5,210	4	3	1,500	21	6,517
45 Printing and publishing, book and job.....	16	69,915			52,140	17,775	17	8	5,740	65	23,239
46 Printing and publishing, newspapers and periodicals.....	165	405,042	13,955	29,450	250,031	112,506	180	28	22,965	440	164,435
47 Roofing and roofing materials.....	5	5,775			2,300	3,475	6			5	1,250
48 Saddlery and harness.....	31	63,475	3,100	9,950	7,855	43,040	34	1	600	32	14,710
49 Ship and boat building, wooden.....	13	51,835	4,850	11,850	16,705	21,480	13	5	4,500	73	46,452
50 Sugar and molasses, refining.....	70	5,957	386	764	4,597	210	76			39	7,097
51 Tinsmithing, coppersmithing, and sheet-iron working.....	37	77,485	6,375	13,450	15,825	41,835	48	2	1,800	76	37,002
52 Turpentine and rosin.....	145	798,373	227,977	99,885	153,219	317,292	198	147	67,775	2,288	530,410
53 Watch, clock, and jewelry repairing.....	76	116,140	10,066	17,409	25,825	62,840	83	4	1,716	32	15,485
54 Wood, turned and carved.....	6	28,855	550	2,850	7,700	18,255	7	1	1,200	26	5,010
55 Woolen goods.....	4	315,700	5,400	96,400	107,900	106,000	2	5	10,166	302	55,192
56 All other industries ²	34	511,333	24,036	54,515	117,665	315,117	85	39	33,004	560	157,119

¹ Does not include many gineries operated in connection with saw, grist, and cottonseed oil mills, or for the use exclusively of plantations on which they are located. For the full number of gineries in operation reference should be made to the special report on cotton ginning.

² Embraces awnings, tents, and sails, 2; cheese, butter, and condensed milk, factory product, 2; clothing, men's, factory product, 2; coffins, burial cases, and

SPECIFIED INDUSTRIES: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
23,648	\$7,035,584	1,726	\$314,019	1,049	\$122,339	\$1,476,855	\$121,163	\$258,157	\$1,088,114	\$14,421	\$21,692,092	\$21,117,554	\$574,538	\$10,481,386	1
19	4,000					625		150	475		15,365	14,965	410	35,350	2
9	2,430					1,450		81	424	23	6,432	6,243	189	20,986	3
243	69,588			2	244	13,069	7,318	1,990	3,461	300	113,010	102,363	11,647	389,182	4
24	8,627					9,830	3,657	176	597		18,151	17,974	180	57,068	5
50	18,200	24	4,400	8	1,504	885		320	565		15,825	15,625	200	61,694	6
63	26,113	1	360	3	440	5,098	3,281	789	1,078		88,598	86,247	2,346	168,877	7
851	195,088			57	5,858	25,882	2,491	3,566	19,557	225	98,871	11,457	87,414	522,325	8
10	1,878					290	100	22	168		6,999	6,899	100	18,705	9
495	226,305	1	100			11,996	2,369	1,846	5,113	2,668	614,485	613,892	593	1,005,689	10
120	46,292			1	187	1,901	285	394	1,232		88,352	86,660	1,692	178,246	11
113	43,452					3,443	945	1,093	1,130	385	46,425	44,489	1,936	134,334	12
1,534	807,899					18,336		15,441	2,895		464,034	447,462	16,572	1,331,401	13
3	543					787	120	6	563	48	1,111	1,111		8,948	14
91	51,299	62	17,157	4	252	11,507	8,304	782	2,296	125	85,582	84,459	1,123	227,554	15
		50	13,344			2,106	1,100	65	941		4,859	4,742	117	33,569	16
54	18,980	6	944	13	1,515	4,223	2,490	723	1,010		94,308	92,468	1,835	162,439	17
383	107,074					42,899	305	13,768	28,326		41,483	22,162	22,321	397,681	18
2,417	281,335			5	418	69,882	5,381	24,031	39,695	775	667,654	558,087	109,617	2,214,949	19
526	153,859	688	128,209	466	57,473	117,117	375	12,307	104,375		767,327	721,618	45,709	1,472,835	20
3	770			1	75	670	245		425		1,685	1,570	15	5,140	21
3	984	1	200			821	764	5	52		1,179	907	272	7,400	22
94	32,800					40,186		6,067	34,119		342,889	330,014	8,875	492,772	23
71	20,353	98	14,125	62	6,550	17,997	150	412	17,435		190,411	188,861	1,550	337,939	24
200	20,688			3	556	3,802	132	2,139	1,385	95	805,894	794,731	11,163	932,816	25
335	158,333	1	400	5	460	30,963	926	3,329	25,798	1,000	193,747	189,925	3,822	438,760	26
9	3,754	3	430			1,159	1,020	53	86		6,794	6,758	36	18,903	27
24	9,164					23,585	9,034	2,777	11,774		16,743	16,800	943	81,834	28
153	58,882	1	960			32,684	120	6,810	25,704		61,932	33,095	31,867	273,899	29
1	240					13		6	7		2,202	2,202		3,559	30
4	1,540					1,664	1,470	51	143		3,744	3,611	133	15,372	31
9,597	2,778,515	11	2,465	68	9,800	448,710	7,042	82,063	359,605		8,422,253	8,422,203	50	15,056,110	32
789	233,708			9	1,375	32,256	2,425	5,215	24,041	575	844,248	836,431	7,814	1,915,775	33
147	38,146	1	180			1,599	471	478	550	100	104,211	104,161	50	156,550	34
6	2,269	3	570	2	150	726	537	81	126	32	9,307	9,307		32,335	35
4	8,610	143	85,980	2	97	18,063	12,662	1,614	3,567	220	165,435	164,812	623	322,737	36
41	21,002			5	360	6,267	1,512	1,115	3,640		22,223	21,268	955	81,100	37
52	25,032					2,465	1,240	423	767	35	40,560	40,000	560	115,559	38
1,507	453,714	13	2,493	1	150	337,141	140	44,117	289,884	3,000	4,952,814	4,803,954	148,860	6,681,121	39
113	47,254	219	26,100	87	8,600	8,518		763	7,750		427,490	421,450	6,040	569,000	40
39	38,720	1	366			1,725	1,416	193	111		31,490	31,485	5	98,608	41
13	5,783	3	1,240	1	64	5,899	3,842	557	900	100	20,467	20,042	425	60,623	42
88	35,471			1	155	4,491	2,655	853	973		95,455	94,923	532	170,316	43
21	6,517					455		237	218		4,274	4,274		18,400	44
50	26,253	8	2,245	7	741	4,539	2,831	479	1,229		33,058	31,805	1,253	162,497	45
316	144,891	35	9,036	90	10,478	31,372	11,006	2,691	13,417	3,333	114,825	110,350	3,973	500,097	46
5	1,250					550	490		60		10,129	10,004	125	18,160	47
31	14,644			1	75	5,267	3,164	756	1,317		45,047	44,722	325	95,128	48
73	46,452					1,829	319	260	840	410	46,376	45,082	1,294	116,744	49
37	6,805	1	217	1	75	50	15	12	23		41,266	39,195	2,071	55,845	50
75	36,852			1	150	8,795	4,838	474	3,483		94,733	93,755	1,028	182,572	51
2,197	517,039	48	7,568	43	5,803	13,655	1,017	4,178	13,219	211	697,539	684,454	13,085	1,772,435	52
31	15,365			1	120	10,525	7,401	759	2,169	196	17,717	17,323	394	39,845	53
25	5,850			1	60	809	210	45	374	350	11,750	11,420	330	29,220	54
146	84,869	111	16,234	45	4,039	17,317		3,511	14,266	49	103,308	94,773	8,530	172,903	55
319	123,999	193	28,660	48	4,460	20,567	2,553	3,179	14,635	400	459,093	448,756	10,337	809,574	56

undertakers' goods, 1; cooperage, 2; cordage and twine, 1; food preparations, 1; furniture, factory product, 2; hosiery and knit goods, 1; jewelry, 1; liquors, vinous, 2; marble and stone work, 1; paints, 1; paper hanging, 1; patent medicines and compounds, 2; plastering and stucco work, 2; rice, cleaning and polishing, 2; scales and balances, 1; sewing machine repairing, 1; trunks and valises, 2; upholstering materials, 2; window shades, 1; wood, preserving, 1.

TABLE 7.—MANUFACTURES IN CITIES AND

CITIES AND TOWNS.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
1 Total for cities and towns.....	538	\$3,008,530	\$352,898	\$1,265,574	\$3,052,936	\$2,832,127	565	891	\$350,508	6,389	\$2,185,873
2 Aberdeen	32	179,625	18,500	84,400	68,725	68,000	37	9	5,520	194	40,229
3 Biloxi	39	417,902	29,987	45,578	116,461	225,836	40	17	11,300	593	136,441
4 Columbus	57	610,481	65,813	185,184	286,206	178,278	59	29	19,635	534	138,639
5 Corinth	38	441,689	25,425	47,800	98,585	269,879	41	39	47,800	476	151,637
6 Handsboro	5	155,221	10,540	13,520	76,581	48,630	5	6	5,900	133	34,280
7 Jackson	83	959,508	74,111	164,222	392,240	322,985	96	82	60,459	785	269,645
8 Meridian	119	1,923,590	206,859	278,229	849,889	500,113	126	70	75,151	1,416	555,409
9 Natchez	48	1,389,691	156,983	221,686	578,870	432,142	46	47	38,413	746	209,566
10 Scranton	15	372,655	95,350	24,200	112,475	140,636	15	5	6,600	167	65,645
11 Vicksburg	65	1,300,890	150,125	259,525	449,690	501,550	69	75	70,528	1,222	592,734
12 West Point	32	198,328	14,700	41,270	78,274	54,084	31	12	9,197	173	56,788

TOWNS UNDER 20,000 IN POPULATION: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
5,132	\$1,088,176	888	\$154,624	374	\$47,573	\$556,103	\$63,411	\$79,126	\$399,878	\$3,638	\$6,404,618	\$6,237,131	\$167,387	\$11,441,651	1
177	36,109	16	4,000	1	120	10,765	2,577	1,617	6,571	-----	110,914	107,161	3,753	226,278	2
225	89,192	245	33,835	123	13,414	32,022	3,196	1,367	26,959	-----	605,663	596,453	9,205	949,031	3
423	113,223	74	17,051	32	3,365	85,912	5,501	4,752	24,539	1,030	382,498	360,683	21,815	753,539	4
335	132,373	126	17,280	15	1,504	27,875	2,092	2,379	22,899	35	388,377	378,355	5,522	759,542	5
124	33,160	-----	-----	9	1,120	4,070	50	430	3,500	-----	127,833	127,168	676	213,844	6
676	248,582	50	14,118	9	945	84,053	11,171	13,719	52,807	6,856	1,075,845	1,042,676	33,169	1,724,395	7
1,241	524,588	97	23,946	78	6,875	131,938	13,342	20,361	97,153	532	1,700,655	1,663,885	31,770	2,980,217	8
493	159,400	163	32,156	90	18,000	130,764	5,464	14,072	111,153	75	704,037	678,030	25,957	1,270,885	9
105	65,745	-----	-----	2	300	6,532	1,650	613	4,159	110	173,319	172,844	475	326,114	10
1,150	519,681	59	11,423	13	1,630	81,040	21,529	15,005	44,506	-----	949,387	922,116	27,271	1,876,843	11
163	55,623	3	815	2	300	11,182	1,749	3,311	6,072	-----	190,490	182,715	7,775	358,303	12

CENSUS BULLETIN.

No. 120.

WASHINGTON, D. C.

December 14, 1901.

MANUFACTURES.

WEST VIRGINIA.

HON. WILLIAM R. MERRIAM,
Director of the Census.

SIR: I transmit herewith, for publication in bulletin form, the statistics of manufacturing and mechanical industries for the state of West Virginia for the census year 1900, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that "The schedules of inquiries relating to the products of manufacturing and mechanical establishments shall embrace the name and location of each establishment; character of organization, whether individual, cooperative, or other form; date of commencement of operations; character of business or kind of goods manufactured; amount of capital invested; number of proprietors, firm members, copartners, or officers, and the amount of their salaries; number of employees, and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used; and character and number of machines employed."

In each of the above particulars the requirements of the law have been observed, but certain of the data thus elicited are reserved for publication in the final volumes.

There were 6 cities and towns in the state withdrawn from the enumerators and their manufacturing statistics collected by special agents, in accordance with the further provision of section 7 of the Census Act. Wherever the phrase "urban manufactures" is used in this bulletin, it applies only to those cities and towns which were withdrawn from the enumerators and committed to special agents, and only to manufacturing establishments within the corporate limits of such places.

The presentation of the manufacturing statistics of cities by specified industries at the present census is confined to

cities having a population of 20,000 or over, and for this reason detailed statistics are presented only for the city of Wheeling.

The statistics of West Virginia are presented in 9 tables: Table 1 showing comparative figures for the state at the several censuses; Table 2 showing all the industries of the state divided between the hand trades and the manufactures proper, and also the statistics of educational and eleemosynary institutions, and establishments with a product of less than \$500, which two latter classes were not reported at previous censuses; Table 3 showing the statistics of the 10 leading industries of the state for 1890 and 1900; Table 4 showing the totals for the city of Wheeling at the censuses of 1880, 1890, and 1900; Table 5 showing the urban manufactures of the state in comparison with the totals for the entire state and the state exclusive of the cities and towns withdrawn from the enumerators; Table 6 showing the statistics for the state by counties; Table 7 showing the statistics for the state by specified industries; Table 8 showing the statistics of the city of Wheeling by specified industries; and Table 9 showing the totals for all industries in each of the cities and towns withdrawn from the enumerators (exclusive of the city of Wheeling).

Table 1 shows the growth of manufactures in West Virginia for the half century which terminates with the Twelfth Census. The manufacturing statistics of the censuses prior to 1850 were too imperfect and fragmentary in character to make it proper to reproduce them in such a table as a measure of industrial growth in the first half of the century. Owing to changes in the method of taking the census, comparisons between the earlier and later decades, represented in Table 1, should be drawn only in the most general way. Nevertheless, the rate of growth in West Virginia manufactures may be fairly inferred from the figures given.

In drafting the schedules of inquiry for the census of 1900 care was taken to preserve the basis of comparison with prior censuses. Comparison may be made safely with respect to all the items of inquiry except those relating to capital, salaried officials, clerks, etc., and their salaries, the average number of employees, and the total amount of wages paid. Live capital, that is, cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries, was first called for at the census of 1890. No definite attempt was made, prior to the census of 1890, to secure a return of live capital invested.

Changes were made in the inquiries relating to employees and wages in order to eliminate defects found to exist on the form of inquiry adopted in 1890. At the census of 1890 the average number of persons employed during the entire year was called for, and also the average number employed at stated weekly rates of pay, and the average number was computed for the actual time the establishments were reported as being in operation. At the census of 1900 the greatest and least numbers of employees were reported, and also the average number employed during each month of the year. The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month. This difference in the method of ascertaining the average number of wage-earners during the entire year may have resulted in a variation in the number, and should be considered in making comparisons.

At the census of 1890 the number and salaries of proprietors and firm members actively engaged in the business or in supervision were reported, combined with clerks and other officials. In cases where proprietors and firm members were reported without salaries, the amount that would ordinarily be paid for similar services was estimated. At the census of 1900 only the number of proprietors and firm members actively engaged in the industry or in supervision was ascertained, and no salaries were reported for this class. It is therefore impossible to compare the number and salaries of salaried officials of any character for the two censuses.

Furthermore, the schedules for 1890 included in the wage-earning class, overseers, foremen, and superintendents (not general superintendents or managers), while the census of 1900 separates from the wage-earning class such salaried employees as general superintendents, clerks, and salesmen. It is possible and probable that this change in the form of the question has resulted in eliminating from the wage-earners, as reported by the present census, many high-salaried employees included in that group for the census of 1890.

In some instances, the number of proprietors and firm members, shown in the accompanying tables, falls short of the number of establishments reported. This is accounted

for by the fact that no proprietors or firm members are reported for corporations or cooperative establishments.

The reports show a capital of \$55,719,938 invested in manufactures and mechanical industries in the 4,415 establishments reporting for the state of West Virginia. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations of the state. The value of the products is returned at \$74,177,681, to produce which involved an outlay of \$1,563,097 for salaries of officials, clerks, etc.; \$12,876,902 for wages; \$3,933,514 for miscellaneous expenses, including rent, taxes, etc.; and \$42,632,819 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of products for the state of West Virginia, \$74,177,681, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the value of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

At the census of 1890 the schedule was so framed that it was impossible to find the net or true value. In the present census the schedule asked for the value of the materials in two classes, those purchased in the crude state and those purchased in the partly manufactured form. From the answers to these questions the net or true value of products may be computed. Thus, for West Virginia, the gross value of products for 1900 was \$74,177,681. The value of materials purchased in a partly manufactured form was \$26,480,035. The difference, \$47,697,646, is the net or true value of products, and represents the increase in the value of raw materials resulting from the various processes of manufacture.

Very respectfully,



Chief Statistician for Manufactures.

WEST VIRGINIA.

West Virginia was organized as a state in 1863, and therefore first appeared in census statistics in 1870.

Table 1 shows the manufacturing and mechanical industries of the state as returned at the censuses of 1870 to 1900, inclusive, with the percentages of increase for each decade. This table also presents the average number of

wage-earners employed by manufacturing establishments, in comparison with the total population of the state, and the value of the land and buildings owned and reported by manufacturers as capital, in comparison with the assessed value of all real estate and improvements.

TABLE 1.—COMPARATIVE SUMMARY, 1870 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.				PER CENT OF INCREASE.		
	1900	1890	1880	1870	1890 to 1900	1880 to 1890	1870 to 1880
Number of establishments	4,416	2,376	2,375	2,444	85.8	(1)	² 2.8
Capital	\$55,719,338	\$28,118,080	\$13,883,890	\$11,084,520	98.2	102.5	25.8
Salaries of officials, clerks, etc., number	1,852	³ 2,629	(4)	(4)	² 29.6		
Salaries	\$1,563,097	³ \$1,419,213	(4)	(4)	10.1		
Wage-earners, average number	33,085	19,340	14,311	11,672	71.1	35.1	22.6
Total wages	\$12,876,902	\$6,911,779	\$4,813,965	\$4,822,164	86.3	60.2	² 0.2
Men, 16 years and over	28,896	17,074	12,900	10,728	69.2	32.4	20.2
Wages	\$12,073,006	\$6,546,797	(4)	(4)	84.4		
Women, 16 years and over	8,349	1,455	(4)	287	130.2	320.5	20.6
Wages	\$671,227	\$256,183	(4)	(4)	163.2		
Children, under 16 years	810	811	1,065	657	3.6	² 23.8	62.1
Wages	\$129,669	\$108,799	(4)	(4)	19.2		
Miscellaneous expenses	\$3,933,514	\$1,960,929	(6)	(6)	100.6		
Cost of materials used	\$42,632,813	\$23,729,089	\$14,027,388	\$14,503,701	79.7	69.2	² 3.3
Value of products, including custom work and repairing	\$74,177,681	\$38,702,125	\$22,867,126	\$24,102,201	91.7	69.2	² 5.1
Total population	958,800	762,794	618,457	442,014	25.7	23.3	39.9
Wage-earners engaged in manufactures	33,085	19,340	14,311	11,672	71.1	35.1	22.6
Per cent of total population	8.5	2.5	2.3	2.6			
Assessed value of real estate	⁴ \$172,250,553	\$121,202,365	\$105,000,806	\$95,024,774	42.1	15.4	9.5
Value of land and buildings invested in manufactures ⁷	\$16,032,225	\$7,754,341	(4)	(4)	93.9		
Per cent of assessed value	8.7	6.4					

¹ Less than one-tenth of 1 per cent.

² Decrease.

³ Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 7.)

⁴ Not reported separately.

⁵ Not reported.

⁶ As given for the year 1899, in the Report of the Auditor of the State of West Virginia, page 46.

⁷ Does not include value of rented property.

Although West Virginia is an agricultural state, Table 1 shows that there has been a considerable growth in the manufacturing and mechanical industries during the last thirty years. The population during these years increased from 442,014 to 958,800, or 116.9 per cent, while the average number of wage-earners employed in manufacturing establishments increased from 11,672 to 33,085, or 183.5 per cent, embracing, in 1900, 3.5 per cent of the entire population, compared with 2.6 per cent in 1870. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 44,833, or 4.7 per cent of the total population of the state. The greatest increase in the value of products, \$35,475,556, or 91.7 per cent, is shown for the decade ending with the year 1900. During the decade from 1870 to 1880 there was a decrease of 5.1 per cent in the value of products. The values for 1870, however, were expressed in a currency which was at a discount in gold, and should be reduced by about one-fifth for purposes of comparison with other census years.

Manufactures in West Virginia are very largely located in the northern part of the state and along the Ohio River, which for 300 miles forms its western boundary. The

value of products reported in 1900 for the 12 counties bordering upon this river amounted to \$43,990,709, or 59.3 per cent of the total for the state. Four of these counties, situated within the narrow strip of territory between the Ohio River and Pennsylvania, reported 44 per cent of the state's total value of products. This localization, which was shown also at the census of 1860, is due partly to the shipping facilities furnished by the Ohio River and partly to abundant supplies of gas and coal in this part of the state. The first natural gas known in America was discovered in West Virginia, and it was here also that it was first used for manufacturing purposes.¹ At the close of 1899 there were in the state 1,646.3 miles of pipe for conveying natural gas to consumers and the production of that year, valued at \$2,335,864, was exceeded by only two states, Pennsylvania and Indiana.² Natural gas has no equal as fuel in the manufacture of glass, the puddling of iron, and the heating of large furnaces in the manufacture of steel. In West Virginia, during 1899, it was used in 305 establishments in these and other industries.³ Many

¹ The Mountain State, by G. W. Summers, pages 76 and 78.

² United States Geological Survey, Mineral Resources of the United States, 1899, Nonmetallic Products, except Coal and Coke, pages 299 and 304.

³ Ibid., page 302.

of the factories in Wheeling use coal mined within or near the city limits, while others are supplied from the coal fields of Marion county, 50 miles distant.

Table 2 divides the industries of the state between the hand trades and the manufactures proper. This table also

gives the statistics for educational and eleemosynary institutions, and establishments with a product of less than \$500; these were not reported at previous censuses, and therefore are omitted from the other tables and their use confined to Table 2.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

CLASSES.	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	COST OF MATERIALS USED.				Value of products, including custom work and repairing.
				Average number.	Total wages.		Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	
Total	6,361	\$56,208,064	7,181	33,294	\$12,894,859	\$3,951,178	\$42,796,662	\$14,271,812	\$26,597,162	\$1,927,688	\$74,598,445
Hand trades ¹	1,886	2,205,747	1,520	2,626	1,029,018	802,239	2,104,484	19,650	2,009,677	75,157	4,794,829
Educational and eleemosynary institutions	8	11,610				87	21,095		20,901	194	30,853
Establishments with a product of less than \$500	1,948	476,216	2,051	209	17,957	17,627	142,754	46,528	93,226		388,911
All other establishments	3,029	53,513,191	3,560	30,459	11,847,884	3,631,275	40,528,329	14,205,684	24,470,358	1,852,337	69,882,352

¹ Includes bicycle and tricycle repairing, 16; blacksmithing and wheelwrighting, 590; boots and shoes, custom work and repairing, 116; carpentering, 93; clothing, men's, custom work and repairing, 116; clothing, women's, dressmaking, 47; dyeing and cleaning, 9; furniture, cabinetmaking, repairing, and upholstering, 43; lock and gun smithing, 5; masonry, brick and stone, 39; millinery, custom work, 127; painting, house, sign, etc., 43; paper hanging, 3; plastering and stuccowork, 12; plumbing, and gas and steam fitting, 46; sewing machine repairing, 2; watch, clock, and jewelry repairing, 89.

Of the 6,361 establishments of all classes shown in this table, 3,329, or 52.3 per cent, were small shops included in the groups of "hand trades" and "establishments with a product of less than \$500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to

\$5,184,740, or 7 per cent of the total products of the state.

In addition to the 6,361 active establishments in the state during the census year, with a capital of \$56,208,064, shown in Table 2, there were 33 idle establishments, with a capital of \$868,450, divided as follows:

INDUSTRIES.	Number of idle establishments.	Capital.	INDUSTRIES.	Number of idle establishments.	Capital.
Brick and tile	4	\$41,000	Glass	5	\$335,720
Explosives	1	85,200	Iron and steel	2	330,536
Flouring and grist mill products	10	12,013	Leather, tanned, curried, and finished	2	15,700
Fruits and vegetables, canning and preserving	1	10,250	All other industries	8	5,682

TABLE 3.—COMPARATIVE SUMMARY OF TEN LEADING INDUSTRIES.

INDUSTRIES.	Year.	Number of establishments.	Capital.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
				Average number.	Total wages.			
Total for selected industries for state	1900	2,060	\$36,407,455	21,347	\$8,636,943	\$1,338,550	\$29,414,149	\$48,897,302
	1890	1,181	15,976,422	11,624	4,077,601	552,163	14,792,977	22,513,520
Increase, 1890 to 1900		879	20,431,033	9,723	4,559,342	786,382	14,621,172	26,383,782
Per cent of increase		74.4	127.9	83.6	111.8	142.4	98.8	117.2
Per cent of total of all industries in state	1900	46.7	65.3	64.5	67.1	34.0	69.0	65.9
	1890	49.7	56.8	60.1	59.0	28.2	62.8	58.2
Cars and general shop construction and repairs by steam railroad companies.	1900	23	1,040,311	2,605	1,256,640	32,355	1,586,916	2,943,557
	1890	7	533,305	1,022	433,355		467,341	913,393
Clay products:	1900	55	2,094,842	1,744	643,820	140,164	297,903	1,451,239
	1890	35	289,628	448	130,575	5,795	69,949	304,855
Brick and tile	1900	41	484,576	475	143,376	25,330	78,769	348,356
	1890	27	202,946	387	107,551	3,036	67,309	249,493
Pottery, terra cotta, and fire-clay products	1900	14	1,610,266	1,269	500,444	114,834	219,134	1,104,883
	1890	8	86,682	61	23,024	2,759	12,640	55,372
Coke	1900	77	4,452,579	3,131	890,024	223,603	1,963,682	3,529,241
	1890	45	1,716,837	1,034	284,375	53,810	709,576	1,130,762
Flouring and grist mill products	1900	787	2,126,470	314	154,623	55,972	4,555,008	5,511,353
	1890	496	1,767,003	545	140,959	64,293	3,223,736	3,302,994
Foundry and machine shop products	1900	62	877,401	501	317,293	45,760	666,244	1,401,852
	1890	30	482,940	355	169,576	27,737	186,621	506,613
Glass	1900	16	1,338,084	1,949	789,422	112,791	593,251	1,871,785
	1890	7	825,313	1,371	511,079	40,805	277,033	945,234

TABLE 3.—COMPARATIVE SUMMARY OF TEN LEADING INDUSTRIES—Continued.

INDUSTRIES.	Year.	Number of establishments.	Capital.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
				Average number.	Total wages.			
Iron and steel	1900	11	\$8,202,910	4,467	\$2,293,624	\$225,165	\$10,422,322	\$16,514,212
	1890	7	4,215,097	2,013	1,098,489	102,624	5,606,883	7,490,934
Leather, tanned, curried, and finished	1900	46	5,049,615	664	224,444	144,458	2,541,197	3,210,753
	1890	50	567,072	210	88,487	28,465	680,298	896,120
Lumber and timber products	1900	950	10,421,570	5,327	1,828,558	314,111	5,584,717	10,612,837
	1890	454	5,086,114	4,182	1,039,530	203,511	3,023,297	5,515,065
Lumber, planing mill products, including sash, doors, and blinds.	1900	83	808,673	555	233,595	41,171	1,199,014	1,820,463
	1890	50	493,118	444	181,196	25,623	543,793	910,640

The 10 leading industries of the state in 1900, as shown in Table 3, embraced 2,060 establishments, or 46.7 per cent of the total number in the state; used a capital of \$36,407,455, or 65.3 per cent of the total; gave employment to 21,347 wage-earners, or 64.5 per cent of the total number; and paid \$8,636,943, or 67.1 per cent of the total wages. The value of their products was \$48,897,302, or 65.9 per cent of the total. In the discussion of Table 3, which follows, these industries are ranked with reference to the value of their products.

Table 3 shows that the manufacture of iron and steel is the most important industry in the state. The 11 establishments reported in 1900 gave employment to 4,467 wage-earners, or 13.5 per cent of the wage-earners employed in the state, and their products were valued at \$16,514,212, or 22.3 per cent of the total value of the products of the state. In 1890 there were 7 establishments, 2,013 wage-earners, and products valued at \$7,490,934. The increase in the value of products, during the decade, was \$9,023,278, or 120.5 per cent. This is a greater absolute increase than is shown for any other industry. The products of the blast furnaces for 1900 were valued at \$3,119,301, while the value of the products of the rolling mills and steel works, including tin and terne plate, amounted to \$13,394,911. The first rolling mill west of the Allegheny Mountains, of which there is any exact record, was in operation near Morgantown as early as 1812.¹ Cut nails were among the products of this pioneer mill, a manufacture which afterward became so important that Wheeling, its chief center, was at one time known as "The Nail City." The industry has declined in recent years as a result of the greater demand for wire nails, which have never been very largely manufactured in West Virginia. The iron and steel manufacture of the state is confined to Wheeling and its vicinity. Its development there is due, in part, to the cheapness of fuel—natural gas being used in almost all the rolling mills—and also to the proximity of the Pittsburg (Pa.) district.

The manufacture of lumber and timber products ranked second among the industries of the state in 1900, with 950 establishments, 5,327 wage-earners, and products valued at \$10,612,837. In 1890 there were 454 establishments,

with 4,182 wage-earners, and products valued at \$5,515,065. The increase in the value of products during the decade was \$5,097,772, or 92.4 per cent. In 1898 there were in the state 16,000 square miles of forests, including spruce, poplar, and one of the largest areas of hardwood timber in the United States.² There was little development of the state's forest wealth until after 1865, owing to the lack of transportation facilities,³ and in 1870 lumbering held only fifth rank among the industries of the state. The railroad construction between the years 1896 and 1900 opened up new regions for lumbering operations and explains, in part, the rapid increase in the industry since 1890. The greatest production shown is for the mountainous counties in the eastern part of the state, the city of Charleston being an important lumber center.

There were 737 establishments engaged in flour and grist milling in 1900, the industry third in rank, with 314 wage-earners, and products valued at \$5,541,353. In 1890, 496 establishments were reported, with 545 wage-earners, and products valued at \$3,902,994. The increase in the value of products during the decade was \$1,638,359, or 42 per cent. This is the first notable increase in this industry since the formation of the state, the value of the products reported at the censuses of 1870, 1880, and 1890 being, in each instance, nearly the same.

There were 77 establishments engaged in the manufacture of coke in 1900, with 3,131 wage-earners, and products valued at \$3,529,241. In 1890, 45 establishments were reported, with 1,034 wage-earners, and products valued at \$1,130,762. The increase in the value of products during the decade was 212.1 per cent. The development of this industry in West Virginia during the last twenty years is remarkable. In 1880 the state produced 3.5 per cent of the coke made in the United States; in 1889, 6.1 per cent; and in 1899, 11.6 per cent, ranking second only to Pennsylvania in that year.⁴ This high rank is due, not so much to the large coal production of the state, which was but 7.6 per cent of the total production in 1899, as to the special suitability of this coal for coking purposes. One-half of the entire production in 1890 was

² Report of the West Virginia Bureau of Labor Statistics, 1897-1898, page 116.

³ History of West Virginia by R. E. Fast and H. Maxwell, page 233.

⁴ See special report on Coke.

¹ The Pittsburg Almanac for 1813, quoted in the Tenth Census of the United States, 1880, Manufactures, general folio 831.

from the ovens of the Flat Top District in the southern part of the state. Next to the Connellsville District this is the most important coking region in the United States.¹ The recent completion by the United States Government of a series of 11 locks and dams on the Kanawha River, rendering it navigable for 90 miles from its mouth, has stimulated the coke as well as the coal production of the Kanawha District drained by this river.

There were 46 establishments engaged in the tanning and currying of leather in 1900, with 664 wage-earners, and products valued at \$3,210,753. In 1890 there were 50 establishments, with 210 wage-earners, and products valued at \$896,120. The increase in the value of products during the decade was \$2,314,633, or 258.3 per cent. Tanning has been carried on in West Virginia in a small way since the early days of its settlement as a part of Virginia. In 1860 the value of leather manufactured in Ohio county alone was \$104,150. But it was during the last decade that the industry became of special importance. The extensive oak and hemlock forests furnish the bark for tanning purposes,² and the rapid growth of the industry since 1890 must be attributed to the increased supply of this material, made available by the great increase in lumbering. The largest production of leather in 1900 was in the eastern and northeastern parts of the state, a region from which a very large lumber product was also reported.

There were 23 establishments engaged in the car construction and general shop work of steam railroad companies in 1900, with 2,605 wage-earners, and products valued at \$2,943,557. In 1890 there were 7 establishments, with 1,022 wage-earners, and products valued at \$910,393. The increase in the value of products during the decade was \$2,033,164, or 223.3 per cent.

There were 16 establishments engaged in the manufacture of glass in 1900, with 1,949 wage-earners, and products valued at \$1,871,795. In 1890 there were 7 establishments, with 1,371 wage-earners, and products valued at \$945,234. The increase in the value of products during the decade was \$926,561, or 98 per cent. These products included 2,288,580 dozen blown tumblers, stem ware, and bar goods, and 61,547 dozen lamps. Glass produced in these factories during the census year was exported to Australia, Canada, Mexico, England, South America, and South Africa. Glass has been manufactured in what is now West Virginia since 1821, when a window glass factory was erected in Wheeling, and it was in this city, in 1864, that

the second great improvement in the glass manufacture of modern times was made.³ The cost of manufacture was reduced by one-half by the discovery of a process which caused the substitution of lime glass for flint glass in the finer products. Natural gas was used as fuel in glass works at Wheeling as early as 1879,⁴ and its cheapness, as well as the superior glass produced as a result of the absence of sulphur,⁵ caused it to be employed almost exclusively in the glass works of the state in 1900.

There were 62 establishments engaged in the manufacture of foundry and machine shop products in 1900, with 591 wage-earners, and products valued at \$1,401,852. In 1890 there were 30 establishments, with 355 wage-earners, and products valued at \$506,513. The increase in the value of products during the decade was \$895,339, or 176.8 per cent. These products included machinery used in the factories and mines, several establishments in and near Parkersburg, the oil center of the state, making the manufacture and repair of oil-drilling machinery a specialty.

There were 83 establishments engaged in the manufacture of planing mill products in 1900, with 555 wage-earners, and products valued at \$1,820,463. In 1890 there were 50 establishments, with 444 wage-earners, and products valued at \$910,640. The increase in the value of products during the decade was \$909,823, or 99.9 per cent.

There were 14 establishments engaged in the manufacture of pottery, terra cotta, and fire-clay products in 1900, with 1,269 wage-earners, and products valued at \$1,104,883. In 1890, 8 establishments were reported, with 61 wage-earners, and products valued at \$55,372. The increase in the value of products during the decade was \$1,049,511, or 1,895.4 per cent. These products included porcelain china and other porcelain ware, and vitrified brick. The industry is carried on almost exclusively in the extreme northern part of the state in the vicinity of East Liverpool, Ohio, one of the most important centers of the pottery manufacture in the United States. This region contains abundant supplies of white plastic clay specially adapted to the manufacture of fine porcelains.⁶

URBAN MANUFACTURES.

Table 4 shows the totals for the manufacturing and mechanical industries of the city of Wheeling, as returned at the censuses of 1880, 1890, and 1900, with percentages of increase.

¹ W. Leighton, Jr., quoted in Tenth Census of the United States, 1880, Manufactures, general folios 1116 and 1117.

² Ibid., general folio 1117.

³ Handbook of Commercial Geography, by G. G. Obisholm, page 390.

⁴ The Mineral Industry, 1893, edited by R. P. Rothwell, pages 194, 195, 206, and 207.

¹ United States Geological Survey, Mineral Resources of the United States, 1899, Metallic Products, Coal and Coke, pages 354, 624, 625, and 626.

² History of West Virginia, pages 233 and 234.

TABLE 4.—COMPARATIVE SUMMARY, WHEELING, 1880, 1890, AND 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.			PER CENT OF INCREASE.	
	1900	1890	1880	1890 to 1900	1880 to 1890
Number of establishments	406	418	227	12.9	84.1
Capital	\$13,224,577	\$8,494,630	\$4,868,288	55.7	74.5
Wage-earners, average number	7,219	6,107	5,512	18.2	10.8
Total wages	\$3,096,730	\$2,471,162	\$2,192,255	25.8	12.7
Miscellaneous expenses	\$1,954,205	\$1,205,981	(?)	62.0	
Cost of materials used	\$9,076,978	\$7,381,940	\$5,203,931	23.0	41.9
Value of products, including custom work and repairing	\$16,747,544	\$13,022,589	\$9,259,844	28.6	40.6

¹ Decrease.

² Not reported.

It appears from Table 4 that there has been a considerable increase during the past decade in the manufactures of Wheeling, the principal city of the state. Although the number of establishments decreased from 418 to 406, or 2.9 per cent, there was an increase in the average number of wage-earners from 6,107 to 7,219, or 18.2 per cent; and in the value of products, from \$13,022,589 to \$16,747,544, or 28.6 per cent. The increase was much smaller in Wheeling than in the state as a whole. The number of

establishments, number of wage-earners, and value of products reported for this city in 1900 constituted 9.2, 21.8, and 22.6 per cent, respectively, of the totals for the entire state.

Table 5 presents the totals for the manufacturing industries of the 6 cities and towns withdrawn from the enumerators and places them in comparison with the totals for the entire state and the state exclusive of these cities and towns.

TABLE 5.—URBAN MANUFACTURES.

	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
				Average number.	Total wages.			
Total for state	4,415	\$55,719,938	5,080	88,085	\$12,876,902	\$3,933,514	\$12,632,813	\$74,177,681
Total for urban manufactures	911	25,551,412	939	15,875	6,684,289	2,614,265	21,785,078	\$7,579,966
Benwood	15	4,352,887	11	2,381	1,300,762	113,349	5,892,372	9,568,963
Charleston	119	1,371,807	110	1,176	454,578	95,991	1,033,443	2,052,762
Huntington	89	2,286,230	92	1,861	871,708	117,075	2,598,937	3,873,432
Martinsburg	101	1,633,024	103	1,105	282,921	113,757	832,551	1,410,514
Parkersburg	181	2,682,887	197	1,688	677,590	219,888	2,350,797	3,926,751
Wheeling	406	13,224,577	426	7,219	3,096,730	1,954,205	9,076,978	16,747,544
Total for state exclusive of urban manufactures	3,504	30,168,526	4,141	17,210	6,192,613	1,319,249	20,817,735	86,597,715
Per cent of urban manufactures to total for state	20.6	45.9	18.5	48.0	51.9	66.5	51.1	50.7

Of the 4,415 establishments in the state, 911, or 20.6 per cent, were located in these 6 cities and towns. They furnished employment to 15,875 wage-earners, or 48 per cent of the total number, and the value of their products, \$7,579,966, formed 50.7 per cent of the total for the state.

Table 6 shows the totals for the state by counties.

Table 7 shows the totals for the state by specified industries.

Table 8 shows the totals for the city of Wheeling by specified industries.

Table 9 shows the totals for the cities and towns withdrawn from the enumerators, exclusive of the city of Wheeling.

TABLE 6.—MANUFACTURES

COUNTIES AND MANUFACTURING AND MECHANICAL INDUSTRIES.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
The State.....	4,415	\$55,719,938	\$6,816,767	\$8,215,458	\$16,730,585	\$23,957,128	5,080	1,852	\$1,563,097	33,085	\$12,876,902
2 Barbour.....	61	139,543	12,259	19,660	69,228	38,396	77	2	775	81	29,904
3 Berkeley.....	150	1,710,138	217,447	374,472	519,921	593,298	157	56	46,384	1,181	307,956
4 Boone.....	18	29,627	10,522	1,960	12,945	4,200	22	2	1,200	24	6,175
5 Braxton.....	80	430,714	119,632	25,975	136,866	148,241	103	6	6,300	158	69,224
6 Brooke.....	56	728,592	45,862	164,168	201,268	812,299	58	40	42,446	762	289,897
7 Cabell.....	140	2,660,511	171,175	467,450	602,500	1,419,886	154	122	98,748	2,269	1,014,510
8 Calhoun.....	22	87,659	1,970	5,400	19,710	10,579	31	1	600	16	4,568
9 Clay.....	39	242,413	79,105	11,751	105,045	46,512	44	17	11,650	205	71,966
10 Doddridge.....	64	109,569	11,631	11,070	40,926	45,942	86	2	2,480	91	43,364
11 Fayette.....	77	1,679,998	419,544	79,220	927,128	254,101	59	56	48,020	889	284,632
12 Gilmer.....	74	154,689	44,437	12,890	51,560	45,802	106	6	3,017	56	18,243
13 Grant.....	29	1,133,885	293,404	79,639	330,177	430,665	25	24	27,324	365	123,396
14 Greenbrier.....	105	741,967	299,812	48,895	238,660	154,600	123	6	3,095	203	67,858
15 Hampshire.....	74	306,984	13,954	47,767	61,615	183,648	85	3	1,500	98	29,765
16 Hancock.....	32	910,343	154,382	392,942	197,302	165,817	98	24	27,158	622	230,709
17 Hardy.....	85	229,945	5,607	51,491	26,272	146,575	41	2	1,120	45	14,493
18 Harrison.....	156	588,121	58,708	101,505	201,160	226,748	170	25	15,890	355	143,523
19 Jackson.....	114	223,600	30,241	29,840	90,979	72,540	159	7	3,519	254	74,307
20 Jefferson.....	94	1,156,795	317,735	242,213	264,526	332,321	100	25	24,280	503	143,362
21 Kanawha.....	199	2,983,670	505,468	264,299	701,785	1,462,123	199	144	127,476	1,822	683,489
22 Lewis.....	75	178,429	20,588	25,305	76,104	55,932	92	6	3,495	132	47,979
23 Lincoln.....	33	47,366	5,081	6,130	29,745	6,460	39	2	550	36	10,600
24 Logan.....	14	9,285	795	3,325	2,990	1,675	15			6	1,700
25 McDowell.....	55	2,069,860	60,947	235,576	1,618,031	155,306	35	100	69,639	1,613	405,626
26 Marion.....	162	1,520,351	150,765	277,994	558,077	533,515	184	67	39,950	890	421,918
27 Marshall.....	99	5,737,154	550,500	1,244,785	1,976,827	1,965,042	106	114	107,895	3,714	1,632,624
28 Mison.....	59	588,350	191,507	98,343	153,937	144,263	72	33	23,528	377	109,463
29 Mercer.....	85	683,810	25,095	65,361	454,534	128,320	101	37	25,006	956	325,252
30 Mineral.....	57	1,270,888	47,296	181,248	199,094	843,250	64	41	27,665	731	311,022
31 Mingo.....	27	268,976	151,135	3,345	52,210	62,285	31	19	5,410	117	42,962
32 Monongalia.....	67	529,682	73,965	132,275	155,772	167,670	82	20	14,546	455	189,311
33 Monroe.....	69	138,109	15,005	27,135	66,600	29,369	90	1	900	31	23,181
34 Morgan.....	48	1,462,793	50,975	178,295	254,358	979,165	55	10	17,881	239	68,911
35 Nicholas.....	45	102,934	20,840	10,285	31,047	40,762	53	6	3,780	51	17,448
36 Ohio.....	432	13,600,987	1,113,242	2,178,516	2,604,652	7,704,577	456	482	452,243	7,348	3,158,959
37 Pendleton.....	55	113,373	6,013	20,197	35,585	51,578	66			45	12,585
38 Pleasants.....	34	129,840	4,630	14,885	37,150	73,175	89	3	4,320	44	27,815
39 Pocahontas.....	40	82,937	31,792	8,585	22,520	20,090	55	6	2,700	55	17,276
40 Preston.....	152	687,283	79,387	69,125	260,640	178,131	169	15	7,250	338	116,778
41 Putnam.....	62	170,872	48,600	19,048	67,300	35,924	82	5	2,200	39	80,631
42 Raleigh.....	56	83,067	8,050	9,662	32,079	33,276	70			36	10,531
43 Randolph.....	97	1,598,966	462,897	102,277	334,172	649,620	116	29	26,928	718	281,931
44 Ritchie.....	94	206,039	27,794	20,310	75,695	76,240	112	3	1,400	107	33,521
45 Roane.....	59	121,320	21,255	12,240	57,133	30,682	73	9	4,900	143	48,265
46 Summers.....	51	211,616	33,072	27,190	83,359	67,995	65	18	8,320	366	149,154
47 Taylor.....	73	370,055	37,135	60,160	144,061	128,699	93	13	8,640	360	165,775
48 Tucker.....	59	2,614,013	177,374	229,880	933,603	1,273,156	54	58	58,745	907	373,653
49 Tyler.....	79	204,890	10,390	28,370	65,341	100,289	89	12	10,520	180	105,611
50 Upshur.....	92	534,325	63,467	48,067	131,615	291,176	117	10	5,794	264	95,234
51 Wayne.....	58	217,273	53,225	28,965	76,892	63,691	74	10	9,780	167	77,998
52 Webster.....	58	719,084	158,945	33,922	234,103	239,064	77	5	5,292	295	104,000
53 Wetzel.....	83	286,761	35,855	43,285	94,205	113,419	111	1	900	171	67,267
54 Wirt.....	44	82,832	8,385	12,420	37,293	29,284	56	4	850	61	21,201
55 Wood.....	214	2,925,004	223,090	314,840	390,903	1,496,171	245	146	122,990	1,809	711,624
56 Wyoming.....	9	107,654	29,075	5,610	38,885	39,084	10	6	5,500	60	20,671

TABLE 7.—MANUFACTURES BY

	Number of establishments.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.	Proprietors and firm members.	Number.	Salaries.	Average number.	Wages.
All industries.....	4,415	\$55,719,938	\$6,816,767	\$8,215,458	\$16,730,585	\$23,957,128	5,080	1,852	\$1,563,097	33,085	\$12,876,902
2 Awnings, tents, and sails.....	4	8,590			1,490	2,100	5	1	250	8	2,900
3 Bicycle and tricycle repairing.....	16	16,810	20	180	7,990	8,620	18	1	650	10	3,553
4 Blacksmithing and wheelwrighting.....	580	351,441	49,733	82,640	63,320	155,748	630			206	79,430
5 Boots and shoes, custom work and repairing.....	116	50,401	8,985	15,435	9,560	16,421	117			26	9,730
6 Bottling.....	9	65,550	12,000	11,500	10,850	31,200	5	10	3,155	26	10,455
7 Boxes, fancy and paper.....	3	37,743	5,000	5,000	13,243	14,500	4	2	792	77	14,781
8 Boxes, wooden packing.....	5	21,956	1,100	4,332	3,204	7,850	4	1	1,000	50	13,458
9 Brass castings and brass finishing.....	3	155,009	2,500	12,980	73,470	66,059	2	9	5,982	69	19,083
10 Bread and other bakery products.....	58	190,887	37,560	53,525	61,304	33,498	64	27	12,191	111	40,066
11 Brick and tile.....	41	484,576	90,012	176,480	123,305	94,779	48	19	13,522	475	143,876

BY COUNTIES: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
28,896	\$12,073,006	3,349	\$874,227	840	\$129,669	\$3,983,514	\$322,054	\$275,843	\$3,052,979	\$282,638	\$42,632,813	\$41,079,759	\$1,553,054	\$74,177,681	1
80	29,113	8	551	1	240	4,908	684	622	3,652	—	146,559	145,229	1,324	247,373	2
682	220,903	442	81,610	57	5,443	116,158	7,652	6,303	61,307	40,806	937,887	916,899	21,048	1,659,890	3
24	6,175	—	—	—	—	886	20	185	181	—	23,521	23,298	223	43,483	4
188	69,224	—	—	—	—	8,182	526	3,681	3,975	—	686,608	684,157	2,451	924,063	5
499	218,188	187	55,496	76	16,178	51,560	8,896	3,153	42,410	2,101	352,398	305,546	46,852	962,192	6
2,148	983,581	97	23,225	24	2,704	151,558	10,751	15,660	123,997	1,150	2,926,508	2,866,641	59,867	4,510,177	7
16	4,568	—	—	—	—	898	60	394	504	—	37,255	36,748	507	60,264	8
204	70,851	—	—	1	215	3,339	18	656	2,665	—	182,347	182,197	150	326,006	9
94	41,974	4	1,050	3	340	8,918	1,117	625	1,373	5,800	159,977	158,541	1,436	273,141	10
865	280,751	5	1,470	19	2,481	49,239	11,340	9,194	28,705	—	747,686	744,205	3,481	1,376,189	11
52	17,537	2	500	2	206	8,448	1,055	752	1,616	25	157,487	155,732	1,705	248,265	12
361	122,656	4	730	—	—	23,873	861	2,015	21,507	—	604,233	603,259	974	879,944	13
189	55,973	11	1,685	3	200	10,717	1,606	3,595	5,516	—	234,819	232,055	2,764	415,416	14
93	29,040	2	500	3	225	22,527	781	1,493	20,253	—	329,564	326,343	3,221	465,494	15
598	226,656	3	690	21	3,863	51,614	671	3,543	46,200	1,200	132,093	65,479	66,614	569,133	16
43	14,333	—	—	2	95	33,202	241	1,251	31,710	—	247,170	246,369	801	325,517	17
310	133,235	37	8,486	8	1,802	25,896	7,809	3,631	14,906	60	400,971	385,507	15,404	800,632	18
242	72,439	2	540	10	1,278	8,345	1,811	2,855	4,179	—	235,449	232,533	2,916	491,941	19
481	140,179	34	5,490	38	3,693	46,100	1,822	4,102	89,701	475	486,828	454,920	31,908	931,403	20
1,695	655,964	103	24,149	24	3,376	122,235	25,043	18,282	77,998	962	1,878,841	1,843,746	35,095	3,609,861	21
127	46,813	4	1,091	1	75	7,853	1,553	1,417	4,883	—	251,390	248,888	3,007	403,389	22
35	10,500	—	—	1	100	1,421	305	441	675	—	99,144	95,133	1,011	145,925	23
6	1,700	—	—	—	—	339	70	116	153	—	14,799	14,714	85	21,016	24
1,602	403,356	4	870	7	1,400	128,814	84,487	9,646	34,681	—	747,884	746,545	1,339	1,443,893	25
769	391,480	72	23,196	49	7,242	79,259	9,121	8,607	60,181	1,400	888,778	862,089	26,689	1,787,461	26
3,312	1,553,718	219	45,423	182	33,483	326,685	2,866	19,698	194,306	109,815	7,597,192	7,060,015	537,177	12,954,865	27
868	105,928	16	2,765	9	775	23,613	4,360	3,699	15,554	—	264,900	239,382	29,518	497,397	28
941	323,773	2	360	13	1,119	38,083	16,334	3,813	18,436	—	536,550	533,426	3,124	1,144,858	29
687	303,251	30	5,942	17	1,829	27,120	1,407	5,637	20,073	8	840,728	830,627	10,101	1,290,949	30
112	41,702	5	1,200	5	1,200	3,925	108	756	3,061	—	150,823	150,670	153	278,579	31
885	164,182	57	15,711	13	2,418	19,106	451	2,501	16,154	—	279,983	268,485	11,498	644,737	32
78	22,596	3	535	—	—	3,334	882	973	929	600	190,241	189,073	1,163	273,724	33
207	65,835	17	1,756	15	1,820	20,862	537	5,007	15,318	—	756,910	755,558	1,342	950,490	34
50	17,330	—	—	1	118	2,649	650	504	1,495	—	88,573	88,279	294	144,037	35
5,423	2,805,811	1,781	324,630	144	23,509	1,963,902	74,905	68,055	1,734,987	85,955	10,252,878	9,736,310	516,063	18,168,861	36
42	12,265	—	—	3	320	3,640	867	572	2,701	—	109,773	108,759	1,014	161,246	37
44	27,815	—	—	—	—	3,486	978	694	1,614	200	84,620	81,972	2,617	171,667	38
55	17,270	—	—	—	—	950	134	429	387	—	95,260	94,765	495	140,760	39
324	114,607	10	1,529	4	642	11,249	1,194	2,905	7,150	—	467,253	461,889	5,364	811,735	40
86	29,966	1	240	2	325	3,913	425	1,029	2,409	80	203,515	202,150	1,365	313,499	41
84	10,381	1	150	1	50	1,089	136	421	532	—	101,240	100,376	864	148,517	42
702	273,436	4	986	12	2,609	59,237	1,721	7,341	50,175	—	712,970	709,090	3,280	1,390,255	43
104	37,963	1	400	2	158	6,873	1,359	1,218	3,276	1,020	231,743	229,112	2,631	377,032	44
142	48,233	—	—	1	52	3,874	833	780	2,261	—	206,156	204,618	1,538	343,771	45
863	147,862	3	292	3	292	12,724	991	1,841	9,892	—	240,656	239,402	1,254	473,256	46
327	157,031	28	8,319	5	425	22,452	3,661	3,530	13,470	1,791	389,522	383,521	6,001	636,652	47
991	372,594	4	864	2	200	112,627	1,200	8,475	102,602	350	1,454,016	1,440,053	13,963	2,376,645	48
163	93,533	24	5,739	3	334	12,557	6,533	1,271	4,703	50	248,702	242,325	6,377	534,599	49
247	92,199	10	2,310	7	775	28,214	1,732	2,585	23,397	—	505,935	501,732	4,203	809,735	50
166	77,898	—	—	1	100	4,103	594	902	2,607	—	141,772	140,377	1,395	316,934	51
289	102,080	—	—	6	1,920	13,599	165	9,347	4,127	—	363,711	363,247	464	616,462	52
137	53,930	31	7,687	3	650	15,144	1,807	1,746	10,591	1,000	375,540	371,709	3,831	603,831	53
59	20,641	1	300	1	260	1,918	582	367	963	—	109,153	108,855	788	182,224	54
1,632	696,297	93	17,243	34	4,084	223,214	23,373	17,089	154,942	27,305	2,539,338	2,484,120	55,219	4,210,232	55
59	20,576	1	96	1	96	2,413	24	906	1,453	—	77,919	77,884	35	159,710	56

SPECIFIED INDUSTRIES: 1900.

28,896	\$12,073,006	3,349	\$874,227	840	\$129,669	\$3,983,514	\$322,054	\$275,843	\$3,052,979	\$282,638	\$42,632,813	\$41,079,759	\$1,553,054	\$74,177,681	1
3	1,450	5	1,450	—	—	678	360	8	210	—	6,890	6,860	30	14,500	2
8	3,133	—	—	2	415	1,560	1,136	101	323	—	8,305	8,059	246	23,146	3
204	79,230	—	—	2	200	15,567	9,761	2,373	3,408	25	183,147	171,332	11,815	620,546	4
26	9,730	—	—	—	—	6,226	4,785	512	929	—	34,929	34,387	542	104,101	5
24	10,144	1	167	1	144	6,735	850	922	4,963	—	103,061	106,871	1,190	142,900	6
21	7,772	50	6,312	6	700	1,336	720	206	410	—	21,623	21,217	406	48,540	7
48	12,958	—	—	2	500	1,571	280	128	363	300	36,399	35,839	1,010	62,295	8
69	19,033	—	—	—	—	1,583	234	46	1,303	—	71,102	69,214	1,888	123,360	9
95	37,508	9	2,175	7	933	53,140	7,308	1,742	44,090	—	212,556	206,182	6,374	393,920	10
448	140,102	27	3,274	—	—	25,330	1,020	2,119	20,991	1,200	78,769	77,574	49,195	346,356	11

TABLE 7.—MANUFACTURES BY

MANUFACTURING AND MECHANICAL INDUSTRIES.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
Carpentering	98	\$567,005	\$57,550	\$66,285	\$54,467	\$388,708	104	34	\$21,750	754	\$267,928
Carriage and wagon materials	4	123,224	9,900	17,909	41,533	55,822	1	8	6,038	72	27,891
Carrriages and wagons	80	345,700	44,135	64,025	51,002	188,538	102	7	6,576	260	174,095
Cars and general shop construction and repairs by steam railroad companies	23	1,040,311	43,958	279,536	250,951	405,366		90	67,646	2,605	1,256,640
Cheese, butter, and condensed milk, factory product.	4	5,835	800	1,200	2,825	1,510	2			2	480
Clothing, men's, custom work and repairing	116	396,503	21,890	40,200	17,007	817,406	133	19	14,186	471	225,027
Clothing, men's, factory product	3	209,574	750	2,500	91,124	115,200	1	6	6,010	88	28,632
Clothing, women's, dressmaking	47	10,550	50	850	2,750	6,900	47	2	750	87	16,395
Clothing, women's, factory product	3	61,000			53,000	8,000	1	1	1,200	52	10,100
Coffee and spice, roasting and grinding	4	64,670	14,000	12,650	12,620	25,400	8	1	468	11	5,085
Coke	77	4,452,579	90,416	380,793	3,565,590	415,780	1	208	126,878	3,131	890,024
Confectionery	17	68,482	320	1,450	17,808	48,904	15	3	3,792	68	22,323
Cooperage	16	91,375	18,740	10,285	18,574	53,776	16	3	2,300	151	67,851
Dyeing and cleaning	9	8,235	2,000	1,500	2,080	2,655	11			27	11,255
Dye stuffs and extracts	4	227,892	5,850	36,000	56,049	129,893	3	8	7,930	63	23,575
Flouring and grist mill products	737	2,126,470	178,478	461,466	1,012,528	479,008	948	24	14,481	314	154,623
Foundry and machine shop products	62	877,401	70,914	121,043	272,405	413,039	57	56	51,281	591	817,293
Fruits and vegetables, canning and preserving	9	95,260	11,670	22,390	28,280	32,970	8	4	1,475	128	18,108
Furniture, cabinetmaking, repairing, and upholstering	43	45,345	8,980	10,600	7,480	13,285	49			30	9,808
Furniture, factory product	8	492,920	28,700	72,086	90,022	302,112	6	24	30,464	333	134,968
Gas, illuminating and heating	3	566,827	49,500	35,500	439,600	42,227		26	10,484	30	39,960
Glass	16	1,338,034	75,142	397,301	234,532	631,109	6	85	97,551	1,949	789,422
Ice, artificial	8	413,452	58,000	77,700	250,823	26,929	1	19	13,716	30	39,537
Iron and steel	11	3,202,910	871,833	1,380,380	2,425,704	3,014,393		105	129,477	4,467	2,293,524
Leather, tanned, curried, and finished	46	5,049,615	110,395	554,202	458,012	3,927,006	38	37	62,889	664	224,444
Lime and cement	7	256,860	142,500	28,500	9,160	76,700	3	15	9,260	128	47,200
Liquors, distilled	3	415,967	30,820	150,400	98,247	138,300	2	5	7,300	44	16,775
Liquors, malt	3	1,714,050	109,811	463,308	366,009	774,922	2	60	70,803	256	117,320
Lock and gun smithing	5	5,155			2,980	2,175	5			5	1,176
Looking-glass and picture frames	5	66,103	1,200	7,700	10,240	46,903		17	9,300	161	54,980
Lumber and timber products	950	10,421,570	3,158,542	463,866	3,103,128	3,691,034	1,324	260	210,877	5,327	1,823,558
Lumber, planing mill products, including sash, doors, and blinds	33	803,673	59,793	88,725	173,399	470,251	126	30	19,760	555	233,595
Marble and stone work	9	93,947	14,600	11,710	35,050	32,587		14	6,810	247	86,548
Masonry, brick and stone	39	90,755	12,950	1,250	19,046	57,509	51	10	5,200	336	143,649
Millinery, custom work	127	208,043	31,203	42,624	6,366	127,855	136	17	5,355	205	48,625
Mineral and soda waters	19	74,222	3,175	3,800	27,890	39,617	23	4	2,135	37	12,755
Monuments and tombstones	25	88,292	15,010	6,775	4,131	62,346	82	28	4,990	68	31,614
Painting, house, sign, etc	43	63,340	5,550	4,555	7,370	50,855	49	3	4,456	130	62,751
Paper and wood pulp	6	925,463	200,350	199,735	302,245	167,130	2	22	25,540	281	98,329
Paper hanging	3	1,110			260	850	4			2	1,450
Patent medicines and compounds	5	17,525	700	700	375	15,750	4	3	1,320	4	1,304
Photography	52	60,375	6,060	7,295	27,620	20,000	50	1	208	47	14,931
Pickles, preserves, and sauces	5	274,783	12,262	40,194	62,013	160,314	3	40	41,032	437	70,542
Plastering and stuccowork	12	9,591	1,450	3,225	546	4,370	15			42	16,124
Plumbing, and gas and steam fitting	46	279,040	33,400	20,000	26,736	198,904	51	29	14,391	255	114,571
Pottery, terra cotta, and fire-clay products	14	1,610,266	230,517	584,345	239,964	505,440	13	57	51,592	1,269	500,444
Printing and publishing, book and job	31	98,289	1,760	5,550	70,014	20,975	35	15	9,996	103	38,048
Printing and publishing, newspapers and periodicals	147	1,050,150	60,325	77,725	506,580	405,520	151	92	73,207	707	295,413
Pumps, not including steam pumps	3	48,150		1,000	3,150	44,000	4			13	7,350
Roofing and roofing materials	21	37,470	7,100	5,300	5,400	19,110	25	3	2,780	52	22,816
Saddlery and harness	126	319,886	20,978	46,215	44,135	208,553	141	8	9,320	227	64,985
Salt	4	331,200	160,500	69,500	52,500	48,700		13	13,540	190	54,305
Ship and boat building, wooden	4	46,455	2,000	4,000	19,200	21,255	4	4	1,575	53	20,204
Slaughtering and meat packing, wholesale	3	313,000	22,000	55,000	33,000	203,000	3	16	11,800	84	42,646
Tinsmithing, coppersmithing, and sheet-iron working	57	142,312	12,105	23,450	26,440	80,317	76	3	1,264	121	56,529
Tobacco, chewing, smoking, and snuff	4	2,253,775	52,500	102,550	49,937	2,048,788	3	50	49,118	318	79,765
Tobacco, cigars and cigarettes	72	351,917	39,360	44,870	16,987	240,800	81	23	15,602	910	332,223
Tools, not elsewhere specified	5	194,106	3,500	3,800	37,746	138,060	6	8	8,600	95	56,547
Vinegar and cider	4	10,025	135	1,140	2,650	6,100	5			4	1,712
Watch, clock, and jewelry repairing	89	96,758	7,673	13,974	25,315	49,796	98	4	1,142	40	18,046
Wood, turned and carved	8	151,339	15,200	37,332	40,673	58,179	6	12	10,620	157	40,162
Woolen goods	33	683,683	23,037	92,408	222,030	341,158	12	16	17,440	384	99,027
All other industries	55	3,313,356	279,130	573,951	1,172,246	1,818,029	44	125	135,767	2,215	816,644

¹ Embraes agricultural implements, 1; baking and yeast powders, 1; baskets, and rattan and willow ware, 2; boxes, cigar, 1; brass, 1; bridges, 1; brooms and brushes, 2; cars and general shop construction and repairs by street railroad companies, 1; cars, steam railroad, not including operations of railroad companies, 1; cheese and butter, urban dairy products, 1; chemicals, 1; cotton goods, 1; dyeing and finishing textiles, 1; explosives, 1; fertilizers, 2; fur hats, 1; gas machines and meters, 1; glass, cutting, staining, and ornamenting, 2; gloves and mittens, 1; glue, 1; grease and tallow, 1; grindstones, 1; hand stamps, 2; hardware, 1;

SPECIFIED INDUSTRIES: 1900—Continued.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
748	\$266,754			6	\$1,174	\$142,521	\$3,389	\$2,822	\$21,219	\$115,091	\$671,052	\$668,918	\$2,139	\$1,327,445	12
70	27,728			2	166	8,461	25	675	2,061	700	42,911	41,297	1,614	111,049	13
258	173,645	1	\$300	1	150	11,604	4,824	1,504	5,276		182,719	178,107	4,612	427,288	14
2,604	1,256,280	1	860			32,856	60	11,831	20,464		1,586,916	1,567,800	19,616	2,948,557	15
1	820	1	160			80	40	15	25		10,228	10,115	118	12,284	16
256	160,224	214	64,647	1	156	42,617	21,847	2,466	9,357	8,947	329,598	326,902	2,696	808,401	17
13	5,172	75	23,520			86,945	500	285	1,210	35,000	365,665	355,130	435	501,050	18
		87	16,395			3,780	3,406	47	827		12,663	12,221	432	56,256	19
2	1,100	50	9,000			22,640	300	50	2,290	29,000	160,192	160,080	112	256,000	20
9	4,799	2	286			3,087	550	787	1,750		201,734	200,909	825	224,876	21
3,124	888,619			7	1,405	226,603	107,390	18,897	100,316		1,966,682	1,958,266	8,416	3,529,241	22
48	19,465	14	2,826	6	532	7,462	3,757	332	3,373		85,258	82,768	2,492	147,410	23
148	67,160			3	691	3,961	415	671	2,875		146,684	145,231	1,403	361,485	24
19	8,907	8	2,318			3,150	2,433	40	677		2,101	1,757	344	25,006	25
63	23,575					14,520	400	695	13,367	158	126,368	117,790	8,578	218,754	26
308	153,603			3	1,020	55,972	3,658	18,197	84,117		4,555,003	4,506,029	48,974	5,541,858	27
588	816,958			6	840	45,760	3,292	5,554	35,894	1,020	666,244	646,478	19,666	1,401,852	28
55	7,858	59	4,220	14	1,030	2,983	50	157	2,776		39,328	37,911	1,417	66,886	29
30	9,808					2,978	1,883	386	1,159	50	19,998	19,880	618	60,400	30
382	184,693			1	275	35,959	6,150	1,916	27,893		175,200	170,040	5,160	454,097	31
80	39,960					19,238		2,347	16,891		32,978	32,592	386	150,686	32
1,319	657,984	468	103,748	162	27,690	112,791	400	4,801	105,637	1,950	593,251	594,316	88,905	1,871,795	33
80	39,537					11,188		3,042	8,146		23,327	9,923	12,404	119,401	34
4,322	2,258,869	5	1,800	140	32,855	225,165		32,591	192,574		10,422,322	9,697,369	914,953	16,514,212	35
663	224,399	1	45	1	45	144,458	415	15,259	128,784		2,511,197	2,535,756	5,441	8,210,753	36
128	47,200					1,400	155	477	768		34,845	10,005	24,840	109,398	37
44	16,778					10,024		1,418	8,606		67,963	65,374	2,589	113,906	38
256	117,320					492,611	300	20,707	471,129	475	197,724	178,925	18,799	1,113,021	39
5	1,176					953	866	30	57		1,226	1,188	38	8,129	40
126	50,280	20	3,920	5	780	1,730	192	413	1,125		59,032	58,686	516	139,425	41
5,266	1,817,684	5	869	56	10,005	314,111	8,448	56,135	249,328	200	5,584,717	5,584,320	397	10,612,887	42
550	237,871			5	1,224	41,171	8,337	4,778	15,585	12,471	1,199,914	1,193,324	6,590	1,820,463	43
240	86,105			7	443	1,866	80	606	1,230		41,765	40,836	929	205,922	44
335	143,529			1	120	11,408	675	173	4,019	6,550	209,120	208,738	382	432,085	45
4	1,950	200	46,547	1	128	25,081	17,907	1,872	5,539	3	246,807	245,738	1,129	490,379	46
34	12,072	2	508	1	175	6,009	1,514	418	4,077		17,817	17,602	215	83,299	47
68	31,814					7,408	1,302	449	4,577	1,060	89,181	88,942	239	180,160	48
129	62,604			1	147	5,375	3,371	228	1,754	22	66,066	65,916	100	188,381	49
263	94,598	18	3,736			44,193		3,612	40,581		274,316	245,281	29,035	527,527	50
2	1,460					319	194	5	120		2,439	2,439		6,155	51
3	960	1	344			1,366	445	21	900		11,128	11,110	18	76,900	52
29	11,080	18	3,901			9,874	7,322	577	1,910	65	33,203	32,716	487	108,031	53
77	36,737	344	82,237	16	1,518	52,649	3,013	2,369	47,267		379,963	377,241	2,722	707,498	54
42	16,124					695	60	88	522	45	17,333	17,848	85	44,263	55
254	114,381	1	240			27,608	7,667	2,003	5,222	12,711	271,293	269,856	1,937	527,963	56
975	429,434	263	64,949	31	6,061	114,334	3,254	7,014	104,666		219,134	118,440	100,694	1,104,888	57
72	32,880	25	5,233	6	535	7,635	3,389	569	2,947	230	38,355	36,746	1,609	127,982	58
501	250,106	140	37,812	66	7,495	75,561	16,674	4,065	53,389	1,433	187,513	180,166	7,347	907,166	59
13	7,350					758	375	83	300		58,040	57,775	265	105,900	60
50	22,562			2	254	2,261	960	264	1,037		60,274	59,744	530	103,407	61
162	57,576	30	4,224	35	3,175	17,063	7,414	1,327	7,772	50	275,536	273,265	2,281	535,288	62
186	54,305			4	500	9,838		2,404	7,434		57,398	51,898	25,600	150,232	63
53	20,204					1,780	593	288	899		19,354	19,184	170	61,170	64
76	40,642	6	1,620	2	884	4,623		1,575	3,048		1,133,954	1,129,754	4,200	1,337,578	65
121	56,529					11,131	5,939	1,694	3,374	124	117,922	116,150	1,772	249,834	66
66	27,901	252	51,864			659,763	310	3,214	656,239		477,253	473,813	3,440	1,362,978	67
644	238,709	197	35,774	69	7,740	334,628	11,550	2,788	320,295		250,490	249,020	870	1,060,126	68
95	56,547					5,334	370	87	4,187		103,825	97,222	6,603	267,616	69
4	1,712					7		2	7		5,022	4,677	345	10,298	70
36	17,496	2	325	2	225	12,221	7,910	717	3,544	50	27,732	26,524	1,208	111,763	71
155	39,862			2	300	5,647	330	738	4,579		99,754	99,634	120	213,537	72
226	70,315	138	26,722	20	1,990	31,649	2,438	2,932	26,229		319,313	312,329	6,484	507,300	73
1,470	689,741	637	114,178	103	12,725	257,981	7,302	15,086	172,965	62,688	4,665,222	4,591,475	73,747	6,296,237	74

hosiery and knit goods, 2; iron and steel, nails and spikes, cut and wrought, including wire nails, 1; ironwork, architectural and ornamental, 1; lamps and reflectors, 1; liquors, various, 1; mattresses and spring beds, 2; models and patterns, 1; oil, not elsewhere specified, 1; petroleum, refining, 1; regalia and society banners and emblems, 1; sewing machine repairing, 2; shirts, 1; stamped ware, 1; tin and terne plate, 2; toys and games, 1; upholstering materials, 2; whips, 1; wire, 1; wirework, including wire rope and cable, 2; worsted goods, 1.

TABLE 8.—MANUFACTURES IN WHEELING

MANUFACTURING AND MECHANICAL INDUSTRIES, AND CITIES AND TOWNS.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
1 All industries.....	406	\$13,224,577	\$1,086,022	\$2,118,951	\$2,545,192	\$7,479,412	426	405	\$439,582	7,219	\$3,096,730
2 Blacksmithing and wheelwrighting.....	17	9,793	1,322	2,260	2,351	3,860	19			15	7,635
3 Boots and shoes, custom work and repairing.....	24	3,562	575	775	1,260	952	24			5	2,191
4 Bread and other bakery products.....	23	125,073	24,260	33,500	45,414	21,899	23	18	10,452	52	21,451
5 Carpentering.....	15	225,176	27,575	31,833	25,969	139,739	18	12	8,858	276	93,161
6 Carriages and wagons.....	8	44,000	7,500	4,100	3,100	29,800	10	4	3,156	49	23,581
7 Clothing, men's, custom work and repairing.....	28	238,753	18,410	21,240	5,796	198,807	36	15	10,966	180	82,024
8 Clothing, women's, dressmaking.....	21	6,335			1,090	5,245	22			47	3,338
9 Coffee and spice, roasting and grinding.....	3	62,670	14,000	12,650	11,620	24,400	7	1	468	10	4,785
10 Confectionery.....	3	56,158			13,058	43,100	4	6	2,562	41	16,719
11 Dyeing and cleaning.....	3	2,800			1,600	1,200	4			14	6,088
12 Foundry and machine shop products.....	10	181,757	14,414	21,888	70,928	75,027	10	14	12,693	120	66,609
13 Furniture, cabinetmaking, repairing, and upholstering.....	4	14,960	3,900	3,100	1,385	6,575	5			11	4,907
14 Iron and steel.....	7	3,787,275	418,443	312,500	938,027	1,588,805	2	35	62,674	1,755	1,049,785
15 Liquors, malt.....	5	1,508,891	100,611	400,808	292,135	715,247	2	46	58,710	205	93,223
16 Looking-glass and picture frames.....	3	1,703			140	1,563	4			4	1,980
17 Masonry, brick and stone.....	14	35,310	5,350	800	10,336	18,774	22	1	780	121	53,607
18 Millinery, custom work.....	15	57,015	13,000	8,250	1,800	31,965	15	10	3,340	71	15,520
19 Mineral and soda waters.....	6	12,071	850	760	4,750	6,721	9	2	1,015	7	1,738
20 Monuments and tombstones.....	3	8,629		1,400	1,329	5,900	3	1	420	9	4,214
21 Painting, house, sign, etc.....	18	62,240	4,150	1,930	4,855	41,305	21	1	150	69	40,502
22 Patent medicines and compounds.....	3	13,800	700	700	200	12,200	3			3	814
23 Photography.....	9	11,800			6,550	4,750	11	1	208	13	4,616
24 Pickles, preserves, and sauces.....	5	274,783	12,262	40,194	62,013	160,314	3	40	41,032	437	70,542
25 Plumbing, and gas and steam fitting.....	13	190,262	31,000	16,850	14,536	127,856	15	7	2,342	112	55,309
26 Printing and publishing, book and job.....	6	21,721	1,000	2,000	15,250	3,471	11	1	960	22	7,280
27 Printing and publishing, newspapers and periodicals.....	5	289,498	30,000	10,000	139,049	110,449	2	52	43,240	133	107,711
28 Roofing and roofing materials.....	6	9,020	650	800	1,575	5,995	6			21	9,332
29 Saddlery and harness.....	7	26,735	700	1,200	4,030	20,805	8	2	2,600	35	13,140
30 Tinsmithing, copper-smithing, and sheet-iron working.....	10	45,265	5,500	9,800	6,625	24,340	14	2	564	37	22,220
31 Tobacco, chewing, smoking, and snuff.....	4	2,253,775	52,500	102,550	49,937	2,048,733	3	50	49,118	313	79,765
32 Tobacco, cigars and cigarettes.....	85	246,592	30,900	29,920	7,565	178,207	40	17	11,722	665	261,942
33 Watch, clock, and jewelry repairing.....	13	10,110			5,025	5,085	12	2	900	16	5,715
34 All other industries ¹	55	3,397,575	269,450	542,593	766,764	1,818,768	40	125	110,152	2,293	854,020

¹ Embraces awnings, tents, and sails, 1; baking and yeast powders, 1; baskets, and rattan and willow ware, 2; bicycle and tricycle repairing, 2; bottling, 1; boxes, fancy and paper, 2; boxes, wooden packing, 2; brass, 1; brass castings and brass finishing, 1; carriage and wagon materials, 1; cars and general shop construction and repairs by street railroad companies, 1; chemicals, 1; cooperage, 2; dyeing and finishing textiles, 1; fertilizers, 2; fur hats, 1; gas, illuminating and heating, 1; glass, 2; glass, cutting, staining, and ornamenting, 1; grease and tallow, 1; hand stamps, 1; hardware, 1; ice, artificial, 2; iron and steel, nails and

TABLE 9.—MANUFACTURES IN CITIES AND

1 Total for cities and towns.....	506	\$12,326,835	\$1,136,707	\$2,148,147	\$3,762,644	\$5,279,337	513	427	\$377,225	3,656	\$3,587,559
2 Benwood.....	15	4,352,887	438,850	998,005	1,539,997	1,381,035	11	57	58,978	2,381	1,300,762
3 Charleston.....	119	1,371,807	136,275	152,900	429,243	653,290	110	95	81,995	1,176	454,578
4 Huntington.....	39	2,286,230	146,125	369,105	495,343	1,275,657	32	87	71,905	1,861	871,708
5 Martinsburg.....	101	1,633,024	211,367	356,612	437,231	551,824	103	56	46,384	1,105	282,921
6 Parkersburg.....	181	2,632,887	204,100	276,435	814,880	1,387,522	197	132	117,963	1,638	677,590

BY SPECIFIED INDUSTRIES: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
5,302	\$2,750,586	1,775	\$323,019	142	\$23,125	\$1,954,205	\$73,767	\$66,168	\$1,728,315	\$85,955	\$9,076,978	\$8,569,619	\$507,359	\$16,747,544	1
15	7,635					1,994	1,606	76	312		8,972	8,424	548	41,551	2
5	2,194					1,700	1,377	47	76		6,046	6,001	45	21,047	3
48	20,690	2	486	2	328	48,060	1,293	916	40,846		130,324	126,681	3,693	222,063	4
272	92,187			4	974	81,034	1,638	1,445	13,653	64,271	144,797	143,940	857	399,655	5
48	23,261	1	300			2,958	1,775	297	836		32,426	31,871	1,056	78,476	6
71	52,468	108	29,400	1	156	21,075	7,819	1,140	3,569	8,547	116,598	115,418	1,180	289,236	7
		47	8,338			1,794	1,729	26	39		7,540	7,335	205	28,386	8
8	4,499	2	280			2,897	2,400	772	1,725		195,594	194,859	675	218,976	9
32	14,779	11	1,784	1	156	5,034	2,410	193	2,481		57,881	56,446	1,435	99,963	10
10	5,104	4	984			2,062	1,920		162		775	578	199	14,006	11
120	66,609					8,223	1,463	894	5,826		56,866	54,739	2,127	218,495	12
11	4,907					1,063	220	158	685		4,917	4,684	233	16,417	13
1,724	1,040,110	5	1,800	26	7,875	108,280		16,659	91,621		4,060,630	3,660,792	399,838	5,833,950	14
205	99,223					420,585	300	17,777	402,608		156,790	142,978	13,812	959,092	15
8	1,700	1	280			810	192	18	100		2,227	2,211	16	6,775	16
121	53,607					2,265	185	63	2,017		67,458	67,411	47	151,778	17
2	1,200	69	14,320			7,750	5,831	538	1,881		69,032	68,743	289	125,400	18
6	1,530	1	208			2,800	686	97	2,107		5,459	5,435	24	29,174	19
9	4,214					2,020	421	60	799	740	3,505	3,435	70	18,825	20
69	40,502					2,565	1,404	115	1,024	22	37,276	37,237	39	117,733	21
2	500	1	344			616	195	14	407		9,485	9,485		16,500	22
9	8,720	4	836			8,988	8,329	107	487	65	7,924	7,788	136	29,885	23
77	36,787	344	82,237	16	1,518	52,649	8,013	2,369	47,267		379,983	377,241	2,722	707,438	24
112	55,509					13,478	8,510	720	2,248	12,000	129,253	128,127	1,126	261,103	25
10	5,179	11	1,938	1	118	1,669	1,060	117	812	180	10,953	10,484	474	24,767	26
161	101,643	21	5,963	1	105	24,215	8,581	1,139	19,495		64,270	63,282	988	276,285	27
30	9,252			1	130	1,099	850	47	642		13,811	13,664	147	35,170	28
84	11,990			1	150	1,819	1,504	70	245		23,565	23,530	35	61,840	29
87	22,220					8,056	1,477	399	1,180		20,525	20,117	408	62,962	30
66	27,901	252	51,864			659,763	810	3,214	656,239		477,253	473,313	3,940	1,392,978	31
543	243,224	85	14,739	87	3,919	269,715	8,844	2,061	258,810		185,438	185,026	412	823,992	32
14	6,440	1	150	1	125	1,744	1,666	36	42		5,629	5,437	192	21,666	33
1,438	689,802	805	156,647	60	7,571	195,825	11,999	14,584	169,112	130	2,573,851	2,503,469	70,382	4,185,580	34

spikes, cut and wrought, including wire nails, 1; ironwork, architectural and ornamental, 1; lamps and reflectors, 1; leather, tanned, curried, and finished, 1; lime and cement, 1; liquors, vinous, 1; lock and gun smithing, 2; lumber, planing mill products, including sash, doors, and blinds, 2; mattresses and spring beds, 1; models and patterns, 1; paper hanging, 1; plastering and stuccowork, 1; pottery, terra cotta, and fire-clay products, 2; slaughtering and meat packing, wholesale, 1; stamped ware, 1; tin and terne plate, 2; tools, not elsewhere specified, 2; toys and games, 1; wirework, including wire rope and cable, 1.

TOWNS UNDER 20,000 IN POPULATION: 1900.

7,720	\$3,408,273	707	\$141,683	220	\$37,603	\$660,060	\$64,247	\$58,078	\$452,553	\$35,182	\$12,708,100	\$12,282,791	\$425,309	\$20,882,422	1
2,710	1,274,592	2	416	119	25,754	113,849	170	13,446	84,918	14,815	5,892,372	5,604,081	288,291	9,568,963	2
1,059	428,521	103	24,149	14	1,908	95,991	23,988	9,776	61,321	906	1,033,443	1,013,913	19,530	2,052,762	3
1,779	852,179	74	18,865	8	664	117,075	9,791	12,489	93,995	850	2,598,937	2,558,910	45,027	3,873,432	4
606	195,463	442	81,610	57	5,443	113,797	7,377	5,929	59,754	40,806	832,551	813,049	19,502	1,410,514	5
1,566	657,113	86	16,613	31	3,834	219,838	23,021	16,497	152,565	27,805	2,350,797	2,297,838	52,959	3,026,751	6

CENSUS BULLETIN.

No. 121.

WASHINGTON, D. C.

December 23, 1901.

MANUFACTURES.

HAWAII.

Hon. WILLIAM R. MERRIAM,
Director of the Census.

SIR: I transmit herewith, for publication in bulletin form, the statistics of manufacturing and mechanical industries for the territory of Hawaii for the census year 1900, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that "The schedules of inquiries relating to the products of manufacturing and mechanical establishments shall embrace the name and location of each establishment; character of organization, whether individual, cooperative, or other form; date of commencement of operations; character of business or kind of goods manufactured; amount of capital invested; number of proprietors, firm members, co-partners, or officers, and the amount of their salaries; number of employees, and the amount of their wages; quantity and cost of materials used in manufactures; amount of miscellaneous expenses; quantity and value of products; time in operation during the census year; character and quantity of power used; and character and number of machines employed."

In each of the above particulars the requirements of the law have been observed, but certain of the data thus elicited are reserved for publication in the final volumes.

These statistics were gathered under the supervision of Mr. Alatau T. Atkinson, of Honolulu, special agent in charge of the enumeration of the population. Mr. Victor H. Olmsted, Assistant Statistician of the United States Department of Agriculture, rendered valuable assistance in the preparation of the text for the accompanying report.

The statistics of Hawaii are presented in 6 tables: Table 1 being a summary of the statistics of the territory for 1900; Table 2 showing all the industries of the territory divided between hand trades and the manufactures proper, and also the statistics of establishments with a product of less than \$500; Table 3 showing the totals for the city of Honolulu in comparison with the totals for the

entire territory; Table 4 showing statistics for the territory by islands; Table 5 showing the statistics for the territory by specified industries; and Table 6 showing the statistics for the city of Honolulu by specified industries.

In some instances, the number of proprietors and firm members, shown in the accompanying tables, falls short of the number of establishments reported. This is accounted for by the fact that no proprietors or firm members are reported for corporations or cooperative establishments.

The reports show a capital of \$11,541,655 invested in manufactures and mechanical industries in the 395 establishments reporting for the territory of Hawaii. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations of the territory of Hawaii. The value of the products is returned at \$24,992,068, to produce which involved an outlay of \$622,564 for salaries of officials, clerks, etc., \$1,886,756 for wages, \$873,300 for miscellaneous expenses, including rent, taxes, etc., and \$12,848,663 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of products for the territory of Hawaii, \$24,992,068, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the

value of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

The schedule asked for the value of the materials in two classes, those purchased in the crude state and those purchased in the partly manufactured form. From the answers to these questions the net or true value of products may be computed. Thus, for Hawaii, the gross value of products for 1900 was \$24,992,068. The value of materials purchased in a partly manufactured form was \$3,101,806. The difference, \$21,890,262, is the net or true value of products, and represents the increase in the value of raw materials resulting from the various processes of manufacture.

Attention may properly be directed to some features of these Hawaiian statistics. The territory became a part of the United States in 1898, and the census of 1900 is, therefore, the first census taken by this Government. This fact renders it impossible to make comparisons with previous years. Industrial conditions in Hawaii are very different from those which exist in other parts of the United States. Sugar manufacturing constitutes 77 per cent of the manufacturing of the territory, as measured by the value of products, the other manufacturing industries being chiefly the hand trades. Moreover, only raw sugar is manufactured, no sugar refining or molasses manufacture being carried on in the territory.

Very respectfully,



Chief Statistician for Manufactures.

TERRITORY OF HAWAII.

The Hawaiian Islands were acquired by the United States under the Act of Congress approved July 7, 1898; and on June 14, 1900, they became a territory of the United States, with the name "Territory of Hawaii," in accordance with the provisions of the Act of Congress approved April 30, 1900.

The islands composing the territory are situated in the Pacific Ocean about 2,100 miles west-southwest of San Francisco, Cal., between the nineteenth and twenty-third degrees of north latitude, and the one hundred and fifty-fifth and one hundred and sixtieth degrees of longitude, east of Greenwich. The group includes 8 inhabited islands with an area of approximately 6,449 square miles; the other islands are small and unimportant. The islands are volcanic in origin and are largely composed of barren, inaccessible mountains. The narrow strips of land extending from the bases of the mountains to the sea, and constituting but a small part of the total area, are almost the only habitable portions.

The manufacturing industries of the territory are confined to the four larger islands—Hawaii, Maui, Oahu, and Kauai—which comprise about 90 per cent of the territorial area, and had, at the census of 1900, a population of 151,325,¹ or 98.3 per cent of the total. The statistics presented can not be compared with earlier periods, for official statistics relating to manufacturing and mechanical industries in the islands were for the first time collected at the census of 1900.

Table 1 gives a summary of the statistics of manufactur-

¹ Including the island of Lanai, not separately returned, but which in 1896 was credited with a population of 105. See Report of the Census of Hawaii for 1896, page 16.

ing and mechanical industries of the territory of Hawaii as returned at the census of 1900, and shows the average number of wage-earners employed in such industries in comparison with the total population of the territory.

TABLE 1.—SUMMARY FOR 1900.

Number of establishments.....	395
Capital.....	\$11,541,655
Salaried officials, clerks, etc., number.....	574
Salaries.....	\$622,564
Wage-earners, average number.....	4,587
Total wages.....	\$1,886,756
Men, 16 years and over.....	4,328
Wages.....	\$1,856,336
Women, 16 years and over.....	151
Wages.....	\$24,692
Children, under 16 years.....	40
Wages.....	\$5,728
Miscellaneous expenses.....	\$876,226
Cost of materials used.....	\$12,848,638
Value of products, including custom work and repairing.....	\$24,992,068
Total population.....	154,001
Wage-earners engaged in manufactures.....	4,587
Per cent of total population.....	3.0

Hawaii is an agricultural territory, but Table 1 reveals a considerable development of manufacturing and mechanical industries. In 1900 there were 395 establishments, with a capital of \$11,541,655, and products valued at \$24,992,068. The average number of wage-earners was 4,587, or 3 per cent of the population. Probably the best indication of the importance of the wage-earning class is afforded by the greatest number employed at any one time during the year. In 1900 this was 7,430, or 4.8 per cent of the total population of the territory.

Table 2 divides the industries of the territory between the hand trades and the manufactures proper. This table also presents the statistics for establishments with a product of less than \$500.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

CLASSES.	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	COST OF MATERIALS USED.				Value of products, including custom work and repairing.
				Average number.	Total wages.		Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	
Total.....	408	\$11,558,609	581	4,618	\$1,830,406	\$876,226	\$12,856,138	\$9,523,934	\$3,108,662	\$228,542	\$25,014,036
Hand trades ¹	174	758,293	223	961	418,245	101,875	607,646	7,889	586,124	13,633	1,653,101
Establishments with a product of less than \$500.....	73	16,954	73	31	2,650	2,926	7,475	619	6,856	---	21,968
All other establishments.....	221	10,785,362	235	3,626	1,408,511	771,425	12,241,017	9,516,426	2,515,682	200,909	23,338,967

¹ Includes bicycle and tricycle repairing, 2; blacksmithing and wheelwrighting, 20; boots and shoes, custom work and repairing, 14; carpentering, 17; clothing, men's, custom work and repairing, 30; clothing, women's, dressmaking, 6; furniture, cabinetmaking, repairing, and upholstering, 6; masonry, brick and stone, 3; millinery, custom work, 2; painting, house, sign, etc., 5; plumbing, and gas and steam fitting, 5; watch, clock, and jewelry repairing, 14.

Of the 468 establishments of all classes, shown in this table, 247, or 52.8 per cent, were small shops included in the groups of "hand trades" and "establishments with a product of less than \$500." The value of the products of these establishments, consisting principally of the sums received for custom work and repairing, amounted to \$1,675,069, or only 6.7 per cent of the total value of the products of the territory.

In addition to the 468 active establishments in the territory during the census year, with a capital of \$11,558,609, shown in Table 2, there were 4 idle establishments, all in the sugar industry, with a capital of \$617,834.

The industrial position of Hawaii is unique in that most of the manufacturing and mechanical industries are maintained for supplying local demands. The exceptions are the sugar industry, coffee cleaning, and rice cleaning and polishing; and the production of rice and coffee is only slightly in excess of local requirements. High grades of brown sugar are produced, almost all of which is shipped to the United States. No molasses is made, as the percentage of sugar extracted is so high as to render the residuum valueless for any purpose except that of a fertilizer, and no sugar is refined. Upon the sugar industry all other industries are dependent, and the prosperity of the islands increases or diminishes as this thrives or languishes.

Lack of labor is a serious obstacle to the complete development of Hawaiian industries, although wages, both of skilled and unskilled employees, in many occupations are, as a rule, higher than those paid elsewhere, and continuous employment is afforded. There are practically no unemployed.

The United States Department of Labor conducted an investigation of labor conditions in the territory during the winter of 1900-1901, and has furnished the Census Office with the following table from its forthcoming report to Congress upon the subject, showing the average rates of wages paid per day in various occupations, both in the city of Honolulu and in suburban sugar-producing establishments. It is to be noted that all employees of sugar-producing establishments are supplied with dwelling houses and fuel in addition to their wages.

OCCUPATIONS.	AVERAGE RATE OF WAGES PER DAY.				
	In suburban sugar-producing establishments.	In urban industries.			
		Rail-road shops.	Planing mills.	Foundry and machine shops.	Building trades.
Blacksmiths.....	\$3.00½	\$3.20½		\$4.48½	
Boiler makers.....	4.16	4.50		4.50	
Bricklayers.....	6.93				\$5.77½
Carpenters.....				3.65	3.59½
Carvers, stone.....					6.60
Chippers.....				2.50	
Coppersmiths.....				3.00	
Cornice makers.....					4.00
Machinists.....	3.82½	3.48½		3.95	
Machine hands.....			\$4.25		
Masons, stone.....					3.42½
Molders.....		4.00		4.00½	
Painters, house.....					2.72½
Pattern makers.....		4.50		3.56½	
Planer hands.....			4.50		
Plasterers.....					5.30
Plumbers.....					5.00
Sticker hands.....			5.00		
Structural iron workers.....				3.37½	
Sugar boilers.....	5.17½				
Timbers.....					2.75
Turners.....			4.00		
Wheelwrights.....	4.00				

While it is not the province of this bulletin to discuss the agricultural features of the territory, it is necessary to refer to them in order to convey a clear understanding of the general industrial situation and, particularly, the prevailing labor conditions. The profitable production of sugar, upon which the industrial prosperity of the territory is founded, is dependent upon the extent of the successful production of sugar-cane. The labor employed in this, the agricultural, branch of the sugar industry is almost wholly Mongolian.

The annexation of the Hawaiian Islands brought them within the scope of the United States laws prohibiting the immigration of Chinese and the importation of laborers under contract. The ranks of these nationalities in the territory have been heavily depleted since annexation, not only by natural causes, death or disability, but by a steady exodus of considerable numbers who, having accumulated sufficient means either to constitute a competence or to enable them to embark in business in their own countries, have returned to their native lands. This diminution is constantly going on, and all efforts to fill the enlarging gap in the labor supply have thus far proved

futile. A few hundred laborers have been brought from Porto Rico, but not in sufficient numbers to supply the growing deficiency; and efforts to procure satisfactory laborers from other sections of the United States have failed. Not only is the number of laborers barely sufficient to properly carry on plantation work in its present development, but the laborers' knowledge of the situation has had the effect of rendering them, as a rule, careless and negligent in prosecuting their employment and irregular in its performance, it being well understood that employers will not readily dismiss inefficient employees, owing to the difficulty of supplying their places.

Table 5 shows that the manufacture of sugar is by far the most important industry in the territory. The 44 establishments reported for this industry gave employment to 2,369 persons, or 51.6 per cent of the wage-earners of the territory, and the products were valued at \$19,254,773, or 77 per cent of the total value of the products.

The manufacture of sugar in the islands began about sixty-five years ago. The crude machinery and primitive methods were not greatly improved upon for many years and the output was small until 1875, when the manufacture received great impetus. New mills of the

best kind, equipped with modern machinery, have since been built.

Some of the other industries in Hawaii are worthy of mention, although none of them approaches in importance the manufacture of sugar. The industry which ranks second in the value of products is the manufacture of fertilizers. There were 3 establishments in this industry in 1900, with 126 wage-earners, and products valued at \$1,150,625.

The manufacture of foundry and machine shop products ranks third. There were 4 establishments in this industry in 1900, with 363 wage-earners, and products valued at \$1,107,030.

There were 41 establishments in the cleaning and polishing of rice in 1900, with 173 wage-earners, and products valued at \$664,300.

URBAN MANUFACTURES.

The only city in the territory of sufficient importance to justify a separate presentation of statistics is Honolulu. Table 3 shows the totals for the industries in this city, and places them in comparison with the totals for the entire territory.

TABLE 3.—URBAN MANUFACTURES.

	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including custom work and repairing.
				Average number.	Total wages.			
Total for territory.....	395	\$11,541,655	458	4,587	\$1,886,756	\$573,300	\$12,818,063	\$24,992,068
City of Honolulu.....	119	2,964,332	159	1,708	976,784	201,958	2,426,046	4,613,125
Per cent of Honolulu to territory.....	30.1	25.7	34.7	37.2	51.8	23.1	18.9	18.5

The relative importance of Honolulu as regards manufactures is clearly indicated by Table 3. With a population of 39,306, or 25.5 per cent of that of the territory, at the census of 1900, the city had 119, or 30.1 per cent of the 395 establishments in the territory, with 25.7 per cent of their total capital. Of the total number of wage-earners, 37.2 per cent were employed in the city, to whom was paid 51.8 per cent of the total wages. Notwithstanding these large proportions, the value of products amounted to only 18.5 per cent of the total for the territory. This is due to the large proportion of sugar manufactured in

suburban establishments. The manufacture of foundry and machine shop products is the most important industry of the city. It is almost wholly based on the constant demands of the sugar-producing establishments for mill-work and machinery.

Table 4 shows the totals for the territory by islands.

Table 5 shows the totals for the territory by specified industries.

Table 6 shows the totals for the city of Honolulu by specified industries.

TABLE 4.—MANUFACTURES

ISLANDS, AND MANUFACTURING AND MECHANICAL INDUSTRIES.	Number of establishments.	CAPITAL.					Proprietors and firm members.	SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.	
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.		Number.	Salaries.	Total.	
										Average number.	Wages.
1 The Territory	395	\$11,541,655	\$190,503	\$1,693,344	\$7,579,378	\$2,078,430	458	574	\$622,564	4,587	\$1,886,756
2 Hawaii	129	2,835,516	11,869	660,986	2,029,675	132,986	127	159	166,484	1,195	409,159
3 Kauai	67	1,653,011	28,195	101,545	1,425,448	102,823	78	126	96,769	714	220,451
4 Maui	46	1,990,768	1,575	210,880	1,769,733	19,070	38	74	69,438	593	160,513
5 Oahu	158	5,062,370	153,864	720,483	2,364,522	1,823,651	215	215	289,873	2,085	1,096,633

TABLE 5.—MANUFACTURES

1 All industries	395	\$11,541,655	\$190,503	\$1,693,344	\$7,579,378	\$2,078,430	458	574	\$622,564	4,587	\$1,886,756
2 Blacksmithing and wheelwrighting	20	17,078	275	6,980	3,496	6,327	27			21	6,972
3 Boots and shoes, custom work and repairing	14	17,551		250	4,270	13,081	23	3	984	39	10,550
4 Bread and other bakery products	8	2,378		900	390	1,688	10			4	901
5 Carpentering	17	360,500	250	24,200	54,925	281,185	23	21	15,756	414	170,948
6 Carriages and wagons	7	80,993	800	3,175	10,760	61,768	4	2	3,600	51	32,880
7 Clothing, men's, custom work and repairing	80	111,307	100	1,750	10,415	99,042	103	8	1,420	194	59,234
8 Clothing, women's, dressmaking	6	5,775			995	4,780	10			21	5,183
9 Coffee and spice, roasting and grinding	4	83,114	10,050	12,200	10,700	53,161	7	2	2,500	17	4,214
10 Coffee cleaning	6	70,379	8,822	17,223	29,116	15,218	3	4	2,760	47	8,924
11 Fertilizers	3	915,304	39,744	196,428	36,856	642,273		11	38,090	125	49,230
12 Food preparations	27	22,735	3,270	3,620	4,960	10,885	43	2	1,256	82	16,789
13 Foundry and machine shop products	4	607,883	25,000	170,600	217,250	195,033	1	25	63,476	363	337,488
14 Furniture, cabinetmaking, repairing, and upholstering	6	21,252		50	1,475	20,300	7	4	4,700	30	19,068
15 Hats and caps, not including fur hats, and wool hats	3	10,073		30	1,195	8,848	3	5	1,693	10	3,974
16 Ice, artificial	4	137,271	52,097	30,251	52,337	2,586	2	4	6,365	19	12,015
17 Lumber, planing mill products, including sash, doors, and blinds	3	46,716		10,185	15,702	20,879	1	4	6,000	35	21,736
18 Masonry, brick and stone	3	194,903	5,000	10,172	11,661	168,067	2	15	23,995	187	115,881
19 Mineral and soda waters	7	60,582	500	1,850	30,768	27,464	7	4	3,960	35	10,868
20 Painting, house, sign, etc	5	1,324	50	300	250	724	7			8	2,470
21 Photography	13	27,188		575	8,580	18,028	14	4	4,380	10	6,480
22 Plumbing, and gas and steam fitting	5	24,425		1,100	3,925	19,400	4	2	2,015	13	12,833
23 Printing and publishing, book and job	5	28,269		5,000	16,886	6,383	3	3	4,392	21	11,594
24 Printing and publishing, newspapers and periodicals	5	81,935			56,593	25,432	4	28	36,192	111	70,052
25 Rice, cleaning and polishing	41	381,625	28,465	56,850	70,200	226,110	7	18	12,100	173	49,124
26 Saddlery and harness	7	29,475	30	3,070	3,575	22,800	7			21	15,626
27 Sugar	44	7,991,642	16,300	1,118,427	6,856,915		5	385	363,610	2,369	748,116
28 Tinsmithing, coppersmithing, and sheet-iron working	12	54,375			11,295	43,580	15	4	3,284	36	22,424
29 Watch, clock, and jewelry repairing	14	16,045			8,350	7,695	14			19	8,138
30 All other industries ¹	22	135,480	250	13,803	45,625	75,747	33	21	19,436	111	52,744

¹ Embraces awnings, tents, and sails; bicycle and tricycle repairing; 2; cars and general shop construction and repairs by steam railroad companies; 1; charcoal; 2; clothing, women's, factory product; 1; confectionery; 2; jewelry; 2; leather, tanned, curried, and finished; 1; marble and stone work; 1; millinery, custom work; 2; oil, castor; 1; pickles, preserves, and sauces; 2; ship and boat building, wooden; 2; soap and candles; 1.

TABLE 6.—MANUFACTURES IN HONOLULU

1 All industries	119	\$2,064,332	\$135,704	\$481,883	\$541,594	\$1,805,091	159	146	\$224,866	1,708	\$976,784
2 Blacksmithing and wheelwrighting	3	7,850		3,500	1,250	2,600	9			6	2,178
3 Boots and shoes, custom work and repairing	6	14,275			3,425	10,850	14	3	984	37	9,890
4 Carpentering	7	346,175		23,500	53,450	269,225	13	21	15,756	355	137,037
5 Clothing, men's, custom work and repairing	28	81,509			6,409	75,100	39	3	1,420	149	48,446
6 Clothing, women's, dressmaking	4	4,980			880	4,100	8			20	5,123
7 Foundry and machine shop products	3	605,833	25,000	170,000	216,500	194,333		25	63,476	362	337,288
8 Furniture, cabinetmaking, repairing, and upholstering	5	20,250			1,450	18,800	6	4	4,700	29	18,728
9 Photography	3	23,740		500	6,090	17,150	2	4	4,380	9	6,000
10 Printing and publishing, newspapers and periodicals	5	81,935			56,593	25,432	4	28	36,192	111	70,052
11 Rice, cleaning and polishing	4	156,770	4,020	28,500	14,000	110,250	15	4	6,120	29	14,380
12 Saddlery and harness	4	19,650			1,950	17,700	5			13	10,578
13 Tinsmithing, coppersmithing, and sheet-iron working	9	53,952			10,985	42,967	12	4	3,284	35	22,136
14 Watch, clock, and jewelry repairing	8	12,050			5,500	6,550	7			13	7,852
15 All other industries ¹	30	1,635,863	106,744	253,883	163,202	1,010,084	25	50	88,554	635	287,101

¹ Embraces awnings, tents, and sails; bicycle and tricycle repairing; 2; carriages and wagons; 2; clothing, women's, factory product; 1; coffee and spice, roasting and grinding; 2; fertilizers; 2; food preparations; 1; hats and caps, not including fur hats, and wool hats; 2; ice, artificial; 1; jewelry; 2; leather, tanned,

BY ISLANDS: 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.						MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.			Value of products, including custom work and repairing.	
Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.										
4,396	\$1,856,336	151	\$24,692	40	\$5,728	\$873,300	\$93,635	\$101,261	\$656,655	\$21,749	\$12,848,663	\$12,700,254	\$148,409	\$24,992,068	1
1,198	401,084	51	7,182	6	893	183,902	12,147	25,717	143,245	2,853	4,592,082	4,586,119	5,963	8,407,093	2
676	215,996	33	3,979	5	476	164,615	8,306	16,275	139,834	200	2,255,515	2,211,465	43,550	4,542,858	3
575	158,042	18	2,471			199,848	2,108	19,656	177,964	120	1,692,857	1,676,522	16,335	3,778,422	4
2,007	1,081,214	49	11,060	29	4,359	324,875	71,074	39,613	195,612	18,576	4,308,209	4,225,648	82,561	8,268,695	5

BY SPECIFIED INDUSTRIES: 1900.

4,396	\$1,856,336	151	\$24,692	40	\$5,728	\$873,300	\$93,635	\$101,261	\$656,655	\$21,749	\$12,848,663	\$12,700,254	\$148,409	\$24,992,068	1
21	6,972					1,896	1,268	38	475	120	15,109	13,865	1,244	40,513	2
36	9,904	1	70	2	576	4,320	3,871	97	352		20,424	20,424		46,533	3
8	767			1	144	795	640	10	145		4,770	4,331	439	10,049	4
411	170,948					30,577	8,363	993	18,376	2,845	187,771	182,509	5,262	492,091	5
50	82,672			1	208	8,745	2,066	438	1,241		50,202	47,819	2,383	105,855	6
176	56,538	12	1,074	6	1,022	20,790	15,644	536	4,074	636	127,002	126,555	447	268,028	7
15	4,291	1	60	5	832	1,213	1,071	17	125		8,115	8,115		18,205	8
5	2,395	3	1,132	9	687	1,580	290	566	724		25,992	25,500	492	38,401	9
18	4,945	29	3,979			2,558	506	83	1,969		60,468	59,398	1,070	94,810	10
126	49,230					20,720	25	7,400	13,295		915,035	908,567	6,468	1,150,625	11
77	16,039	5	750			5,540	2,958	191	2,391		25,145	22,548	2,597	61,932	12
359	336,749	2	375	2	364	33,546	7,560	4,084	21,894	8	587,236	551,027	36,209	1,107,030	13
30	19,068					2,641	1,980	51	610		19,230	19,230		59,635	14
7	3,062	8	912			2,417	1,630	120	667		10,763	10,763		24,940	15
19	12,015					5,805	100	1,160	4,545		15,785	1,047	14,688	56,522	16
85	21,736					4,327	2,000	767	795	765	42,276	39,464	2,812	91,261	17
187	115,881					29,989	1,500	409	10,905	17,175	163,430	162,680	750	536,650	18
35	10,868					4,783	1,132	617	3,034		24,579	23,957	622	88,977	19
8	2,470					357	220	5	182		3,930	3,930		9,332	20
10	6,480					3,581	2,328	129	621		10,540	10,530	10	31,835	21
13	12,833					1,508	905	80	318	200	30,450	30,192	258	70,570	22
17	11,274			4	620	1,862	916	49	597		4,441	4,188	253	28,712	23
101	66,412	10	3,640			12,512	5,196	503	6,813		23,736	23,636	5,050	170,804	24
171	48,800			2	324	23,329	8,610	2,174	12,545		481,925	477,068	4,857	664,300	25
21	15,626					3,600	2,456	128	1,616		47,332	47,332		77,900	26
2,286	737,219	79	10,674	4	223	620,733	4,750	79,455	541,278		9,777,922	9,720,398	57,524	19,254,773	27
36	22,424					6,175		850	1,075		33,140	35,747	2,602	91,097	28
17	7,826			2	312	5,258	4,565	55	638		9,538	9,259	279	30,500	29
103	50,902	6	1,426	2	416	17,148	10,685	761	5,702		112,478	110,135	2,343	234,182	30

BY SPECIFIED INDUSTRIES: 1900.

1,641	\$962,866	38	\$9,559	29	\$4,859	\$201,958	\$69,795	\$18,836	\$94,751	\$18,576	\$2,426,046	\$2,344,350	\$81,696	\$4,613,125	1
6	2,173					567	443	15	109		7,440	7,000	440	14,800	2
34	9,244	1	70	2	576	3,331	3,141	89	151		16,510	16,510		36,965	3
355	137,037					26,881	8,108	952	17,821		156,902	151,728	5,174	412,017	4
139	46,488	9	1,254	4	704	16,128	11,061	499	3,422	636	94,743	94,510	233	192,630	5
15	4,291			5	832	1,038	911	17	110		6,200	6,200		15,180	6
358	336,549	2	375	2	364	33,372	7,500	4,072	21,800		586,831	550,677	36,154	1,104,930	7
29	18,728					2,430	1,860	35	535		18,040	18,040		57,650	8
9	6,000					2,829	2,300	129	400		8,740	8,740		23,720	9
101	66,412	10	3,640			12,512	5,196	503	6,813		23,736	23,636	5,050	170,804	10
29	14,380					8,194	1,420	795	5,979		133,971	130,014	3,957	188,413	11
13	10,573					2,637	1,856	85	716		28,465	28,465		48,700	12
35	22,136					5,487	4,150	348	989		37,307	34,950	2,357	89,092	13
16	7,540			2	312	4,232	3,734	52	446		8,494	8,229	265	31,000	14
505	281,310	16	4,220	14	1,571	82,270	17,535	11,335	35,460	17,940	1,293,667	1,265,601	28,066	2,228,224	15

carried, and finished, 1; lumber, planing mill products, including sash, doors, and blinds, 1; masonry, brick and stone, 2; millinery, custom work, 2; mineral and soda waters, 1; plumbing, and gas and steam fitting, 2; printing and publishing, book and job, 1; ship and boat building, wooden, 2; soap and candles, 1.



Twelfth Census of the United States.

CENSUS BULLETIN.

No. 122.

WASHINGTON, D. C.

December 30, 1901.

MANUFACTURES.

INDUSTRIAL COMBINATIONS.

Hon. WILLIAM R. MERRIAM,
Director of the Census.

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics relating to the so-called "industrial combinations," as they existed during the census year ending May 31, 1900. These statistics have been prepared to meet the popular demand for information regarding corporations, organized in recent years by the combination or consolidation under a single corporate management of a number of plants engaged in the same line of industry. When the census of manufactures is completed, it will be possible to show what percentage of the total products of manufactures in the census year was controlled by these industrial combinations, but at present it is only possible to show the actual figures for these establishments.

Some misconception exists as to what constitutes an "industrial combination," and it was necessary, in order to obtain a uniform basis of tabulation, to fix a definition which should limit and designate the corporations to be included. The following definition was therefore formulated, with your approval:

"For the purpose of the census, the rule has been adopted to consider no aggregation of mills an industrial combination unless it consists of a number of formerly independent mills which have been brought together into one company under a charter obtained for that purpose. We therefore exclude from this category many large establishments comprising a number of mills which have grown up, not by combination with other mills, but by the erection of new plants or the purchase of old ones."

The word "trust" was avoided in this definition, because, while it may have come to convey to the popular mind a definite significance, it stands technically for a form of organization under which the stockholders of each of the separate companies assign their stock to a certain

number of trustees, thus giving to these trustees an irrevocable power of attorney to vote the stock as they see fit. This form of organization has been declared illegal by the act of July 2, 1890, Fifty-first Congress, first session, entitled "An Act to protect trade and commerce against unlawful restraint of monopolies," 26 Statutes at Large, page 209, and by the statutes of many states.

The definition was found to be not sufficiently comprehensive, in that it did not take cognizance of a class of corporations organized for the purpose of holding the stock of other corporations, but not directly owning the plants nor carrying on the business of manufacturing, which continues to be done by the constituent companies. In these cases the profits of the constituent companies form the fund from which the dividends of the holding company are paid. Of the combinations here included several are of this class. There are numerous instances of combination or association of independent establishments and corporations, for the purpose of selling goods at uniform prices, or through a single agency, or both, of which no cognizance has been taken in these tables, since they are in the nature of agreements only, similar in character to those which are often found to exist between dealers in milk, drugs, and other merchandise. These organizations or associations are often more effective in regulating prices, particularly in selected localities, than actual consolidations under a charter. But they are voluntary and mutual, and can not be statistically traced.

This definition excludes from the category of industrial combinations a number of corporations which are commonly considered as such combinations, because they represent enormous aggregations of capital, or control a large number of plants. Some of these large establishments are not incorporated; and many of them arose from very small beginnings, and have increased from time to time by the construction of new mills, or by the purchase

and rehabilitation of other plants, not through any method of combination or consolidation, or any change in the previous management.

In order to avoid any misunderstanding as to the corporations included by the Census Office in the group of industrial combinations, there is presented, in Table 3, a list giving the names and addresses of these corporations, together with the date of their organization, the number of plants controlled by each, the amount of bonds and stock authorized by their charters, and the amounts actually issued at the time the census was taken. The list contains the names and addresses of 188 corporations, controlling 2,029 plants that were active during the census year, and also 174 plants that were reported as idle during that period, showing an average of 11 active plants to each corporation.

In order that each branch of manufacturing industry may receive its proper credit, it has been found necessary, in some cases, to secure from companies engaged in the manufacture of two or more classes of products of a different nature, a separate report for each. This is particularly true in the case of iron and steel manufacture, in which industry separate returns were required for the blast furnaces; rolling mills, pipe works, tin-dipping plants, foundries and machine shops, and other branches. These will also appear in the statistics of manufactures as separate and distinct plants, although the operations of all may really be carried on under one roof, and are generally considered as one establishment. This will account for what appears to be an excess in the number of plants accredited to the American Tin Plate Company and others of the large iron and steel corporations. The American Tin Plate Company operates 34 rolling mills for the production of iron and steel sheets, and in connection with these they also operate 31 tin-dipping plants, making, in all, 65 plants. Although these apparent duplications occur principally in the iron and steel industry, there are a number of such instances in other groups, chief among which is that of the National Lead Company, in the group of "metals and metal products

other than iron and steel." The nature of the products of this company made it necessary to secure several separate reports from some of the establishments controlled, thus making the total number of plants appear to exceed what is usually accredited to that company.

The list and the statistics given in this bulletin are subject to revision prior to the publication of the final census reports. Correspondence is invited which will reveal any error of inclusion or omission in the list. Attention is, however, called to the fact that many industrial combinations, some of them of great magnitude, like the United States Steel Corporation, have been formed since the completion of the census year, and their returns are not included in these tables except as some of their constituent parts were previously included in an industrial combination.¹

The list given in Table 3 reveals the fact that 63 of the 188 corporations herein treated as industrial combinations were organized prior to the year 1897, and that in the years 1897, 1898, 1899, and prior to June 30, 1900, there were organized 7, 20, 79, and 13 corporations, respectively. Of the total number, 92, or 50.3 per cent were chartered during the eighteen months from January 1, 1899, to June 30, 1900. This wholesale reorganization of industry, right upon the eve of the taking of the census, thrust upon the division of manufactures a multiplicity of problems such as had never before confronted it.

There have been excluded from the statistics of the industrial combinations all corporations engaged in the manufacture and distribution of gas and electric light and power. A great many combinations in this branch of industry exist throughout the country, but it was impossible for the Census Office to trace all of them, and it seemed inexpedient to include their statistics, not only for the reasons given, but also because, as a general rule, combinations in this industry affect only the local supply of gas and electric light and power, and therefore do not possess the economic significance which attaches to this method of production in other branches of industry. Moreover, under the provisions of the census act, the sta-

¹ The following is a statement of the constituent companies absorbed by the United States Steel Corporation, the amount of their authorized capitalization at the time of their absorption, and the amount of capital stock issued:

	AUTHORIZED CAPITALIZATION AND BONDS.				CAPITAL STOCK AND BONDS ISSUED.			
	Total.	Bonds.	Preferred.	Common.	Total.	Bonds.	Preferred.	Common.
United States Steel Corporation.....	\$1,404,000,000	\$304,000,000	\$550,000,000	\$550,000,000	\$1,005,851,740	\$301,000,000	\$340,726,670	\$363,625,070
Constituent companies:								
Total.....	829,484,000	4,484,000	397,500,000	427,500,000	707,162,740	2,811,000	840,726,670	363,625,070
The Carnegie Company.....	160,000,000		80,000,000	80,000,000	156,800,000		78,400,000	78,400,000
American Bridge Company.....	70,000,000		35,000,000	35,000,000	61,055,600		30,527,800	30,527,800
Lake Superior Consolidated Iron mines.....	80,000,000		15,000,000	15,000,000	23,425,940		14,712,970	14,712,970
Federal Steel Company.....	200,000,000		100,000,000	100,000,000	99,745,200		53,260,900	46,484,300
American Steel and Wire Company of New Jersey.....	90,000,000		40,000,000	50,000,000	90,000,000		40,000,000	50,000,000
National Tube Company.....	80,000,000		40,000,000	40,000,000	80,000,000		40,000,000	40,000,000
National Steel Company.....	63,484,000	2,484,000	27,000,000	32,000,000	61,811,000	2,811,000	27,000,000	32,000,000
American Sheet Steel Company.....	53,000,000		26,500,000	26,500,000	49,000,000		24,500,000	24,500,000
American Tin Plate Company.....	50,000,000		20,000,000	30,000,000	46,325,000		18,325,000	28,000,000
American Steel Hoop Company.....	38,000,000		14,000,000	19,000,000	33,000,000		14,000,000	19,000,000
Shelby Steel Tube Company ¹								

¹ In June, 1901, a majority of the capital stock of the Shelby Steel Tube Company was purchased by the United States Steel Corporation. The total authorized capital stock of the Shelby Steel Tube Company is \$15,000,000, of which \$13,150,500 has been issued.

² Underlying bonds.

tistics of electric light and power are reserved for the special reports provided for in section 8. The statistics relating to the 2,029 separate plants controlled by the 183 corporations represented in these tables are shown by states in Table 2.

In obtaining these statistics for the census, this office has received the utmost courtesy, consideration, and assistance from the officers and employees of these industrial combinations. There has been but a single exception to this rule. Every facility was placed at the disposal of our agents to enable them to obtain the details desired in the most accurate form, and directly from the books of the corporations. In a number of cases the services of one or more clerks or bookkeepers were cheerfully given for several weeks, in order to make possible the procurement of the necessary data.

In spite of this fact, the preparation of the reports for these establishments was attended with numerous difficulties, and the development of the industrial combination has enormously increased the complexities of the manufacturing census required by Congress. To illustrate these complexities: A number of these corporations were organized during the census year, and had been in operation only during a part of that year. In some of these cases, the books of the constituent plants were not available, and it was therefore possible to obtain estimates only of their operations. Again, it is necessary to present the manufacturing statistics by geographical divisions, in order that each locality may be properly credited with its local statistics, as shown in Table 2, where the statistics are presented by state totals. Many of the industrial combinations have plants in different states, or in different counties and cities of the same state, but do not keep their account books so that the data of the several plants are separately obtainable. In all such cases it was necessary to divide the one report into several separate parts, according to the best estimates that could be obtained, either from the general office or by application to the individual plants. Again, it is customary for these industrial combinations to devote different mills or factories to different processes, one factory often furnishing the partially finished parts or materials for another; and upon the products of these preparatory mills and factories no value is placed by the corporation, since they are not sold. In all such cases, a value must be estimated in order that the locality may be duly credited with the capital invested and the product created by labor employed there. From the completed returns, this estimated value of the partially finished materials must subsequently be subtracted, to avoid a duplication in the value of the ultimate products into which they have entered. This explanation will show that under the most favorable conditions, and with every disposition on the part of the officers to furnish exact information, it is necessary to make estimates, which are approximately accurate, but can not, in the nature of things, be absolutely exact.

The difficulties referred to were even more serious, in the matter of capital; and here at least much trouble was encountered in inducing the managers of these corporations to make returns in conformity with the census schedules of inquiry. These schedules call for the actual investment of capital, in the form of lands, buildings, machinery, materials, and stocks on hand, etc., and take no cognizance of the nominal capitalization of the corporations in question. This capitalization has been effected, in many instances, on the basis of the supposed earning capacity of the several establishments embraced in the corporation, and is therefore in excess of the actual cash invested in the business, or the market value of the plants at valuations based upon ordinary methods of assessment. While in many cases there existed an actual inventory of the value of the several plants, it did not always exist, or was not always obtainable, and any distribution between the several plants of the live capital actually required to carry on the business was necessarily an estimate, made in some cases in this office, on the basis of the value of the product of each plant considered in connection with the pay-roll of the same. While estimates of this character are unsatisfactory, and may affect the totals for the different states, they do not change the total for all the companies, and are in the nature of the statistics unavoidable.

The Census Office has aimed in this presentation to account only for such capital—in fixed plant and live assets—as was actually invested in the establishments covered.

The requirements of the Twelfth Census included a statement as to the actual value of the land, buildings, and machinery of each manufacturing plant, and the total amount of live capital invested in manufacturing operations by each company. In addition to the reports for the 2,029 active plants, the office received reports as to capital invested in 118 plants out of the 174 that were idle during the census year. The following statement summarizes the totals for the capital reported for both active and idle plants:

	Total.	Active.	Idle.
Number of plants	2,147	2,029	118
Capital:			
Total	\$1,458,522,578	\$1,433,804,920	\$24,717,658
Land	156,885,285	152,266,768	4,618,522
Buildings	260,855,684	254,491,859	6,364,825
Machinery, tools, and imple- ments	398,315,548	391,227,443	7,088,105
Cash, bills receivable, etc.	642,466,056	635,819,355	6,646,701

In addition to the 118 idle plants contained in the above statement, there were also 56 plants which were idle during the census year, but concerning which no data could be obtained.

The following statement gives the number of idle plants and the amount of idle capital reported in each group of industries:

NUMBER AND CAPITAL OF IDLE PLANTS REPORTING.

	Total.	Iron and steel and their products.	Food and allied products.	Chemicals and allied products.	Metals and metal products other than iron and steel.	Liquors and beverages.	Vehicles for land transportation.	Paper and printing.	Clay, glass, and stone products.	Lumber and its remanufactures.	Miscellaneous industries.
Number of plants reporting.....	118	22	4	39	5	17	1	3	21	4	2
Capital:											
Total.....	\$24,717,653	\$6,376,750	\$115,000	\$12,464,588	\$560,699	\$2,010,976	\$3,000	\$146,542	\$1,540,576	\$1,444,522	\$50,000
Land.....	\$4,618,522	\$945,676	\$16,000	\$2,026,050	\$186,500	\$797,500	\$3,000	\$25,900	\$472,896	\$440,000	\$5,000
Buildings.....	\$6,364,325	\$2,545,766	\$39,000	\$2,025,929	\$339,397	\$289,000	\$4,000	\$53,000	\$533,243	\$505,000	\$25,000
Machinery, tools, and implements.....	\$7,088,105	\$2,809,273	\$40,000	\$2,536,475	\$84,802	\$754,476	\$1,000	\$67,642	\$469,437	\$325,000	\$20,000
Cash and sundries.....	\$6,646,701	\$376,046	\$20,000	\$5,846,134		\$170,000			\$60,000	\$174,522	

There is presented, in Table 3, a statement of the actual amount of the capitalization, authorized and issued, of each of the corporations considered, divided between bonds, preferred stock, and common stock. This statement has been compiled from returns made by corporations direct to this office.

In addition to manufacturing operations, some of the companies for which statistics are presented herewith were engaged in mercantile, transportation, and other pursuits, and their capital stock and bonds were issued to cover all their operations. In many instances the value of the related industries thus carried on is enormous, as in cases where iron and steel companies own mines from which they obtain their raw material, and railroads and steamships by which they transport it; or where paper making companies own vast tracts of forests from which they expect to obtain their wood for pulp for years to come. It has been found impossible to divide the capitalization so as to show only that portion which represents the manufacturing operations of these corporations, and care should be taken, therefore, not to regard this total capitalization as in any sense equivalent to the actual capital employed exclusively in manufacturing, which is shown in Tables 1 and 2.

The authorized capitalization of the several corporations included in this report, and the amounts of the capital stock issued, are summarized in the following statement:

	Authorized.	Issued.
Total.....	\$3,607,539,200	\$3,085,200,868
Bonds.....	270,127,250	216,412,759
Preferred stock.....	1,250,540,900	1,066,525,963
Common stock.....	2,077,871,050	1,802,262,146

While, as stated above, some of these combinations are

engaged in mercantile pursuits, their primary object is manufacturing, their mercantile interest being subservient to the industrial, and is only engaged in because it is of assistance to and promotes the object for which the organization was formed.

There are also certain intangible assets of which the census figures take no cognizance, such as patents, trademarks, franchises, good will, etc., whose value is included in the above capitalization. With this explanation, the true value of the capital invested in active and idle plants, \$1,458,522,573, may be compared with the bonds and capital stock issued, amounting to \$3,085,200,868, of which it forms 47.3 per cent, exceeding the amount of bonds and preferred stock issued, \$1,282,938,722, by \$175,583,851.

The par value of the bonds and stocks of these corporations has been given in Table 3. Attention may be directed to the fact that these bonds and stocks, in a majority of instances, are listed in the several stock exchanges of the country, and are there bought and sold at prices sometimes above par, and sometimes below par, in accordance with the public estimate of their true value, on the basis of actual investment or actual earning capacity. As these market values fluctuate from day to day, it is impossible to make a correct statement of the actual market value of the stocks and bonds represented in the total capitalization of \$3,085,200,868, shown in this table; and it is therefore impossible to state whether this market value is greater or less than the amount of actual capital invested, as shown in Table 1.

The following summary of Table 3 shows the total authorized capitalization of the plants engaged in each group of industries:

SUMMARY OF CAPITALIZATION.

	Total.	Iron and steel, and their products.	Food and allied prod- ucts.	Chemicals and allied products.	Metals and metal products other than iron and steel.	Liquors and beverages.	Vehicles for land transpor- tation.
Number of plants controlled	12,208	489	277	295	118	258	72
Capitalization:							
Amounts authorized by charter:							
Total	\$3,607,539,200	\$978,799,000	\$338,818,750	\$368,049,400	\$245,900,000	\$277,182,050	\$208,800,000
Bonds	\$270,127,250	\$25,949,000	\$32,948,750	\$13,750,000	\$10,800,000	\$64,684,500	\$10,800,000
Total stock	\$3,337,411,950	\$952,850,000	\$305,870,000	\$354,299,400	\$235,100,000	\$212,497,550	\$198,000,000
Preferred stock	\$1,259,540,800	\$430,850,000	\$130,425,000	\$108,812,500	\$60,500,000	\$66,258,000	\$54,500,000
Common stock	\$2,077,871,150	\$522,000,000	\$175,445,000	\$245,487,100	\$174,600,000	\$146,239,550	\$143,500,000
Amounts issued:							
Total	\$3,085,200,868	\$784,420,295	\$290,844,200	\$287,651,295	\$212,070,600	\$248,830,800	\$199,980,000
Bonds	\$216,412,759	\$20,614,000	\$12,725,900	\$9,294,000	\$8,565,000	\$55,629,142	\$10,800,000
Total stock	\$2,868,788,109	\$763,806,295	\$277,618,300	\$278,357,295	\$203,505,600	\$193,201,158	\$189,680,000
Preferred stock	\$1,096,625,963	\$349,708,485	\$117,837,500	\$78,151,084	\$50,815,500	\$62,508,159	\$52,840,000
Common stock	\$1,802,262,146	\$414,042,810	\$160,280,700	\$200,206,211	\$152,690,100	\$130,797,989	\$136,840,000
	Tobacco.	Textiles.	Leather and its finished products.	Paper and printing.	Clay, glass, and stone products.	Lumber and its remanu- factures.	Miscellaneous industries.
Number of plants controlled	41	72	108	119	208	59	97
Capitalization:							
Amounts authorized by charter:							
Total	\$205,000,000	\$172,250,000	\$219,000,000	\$188,250,000	\$81,690,000	\$45,800,000	\$294,050,000
Bonds		\$39,250,000	\$20,000,000	\$41,250,000	\$9,200,000	\$1,800,000	\$800,000
Total stock	\$205,000,000	\$133,000,000	\$199,000,000	\$147,000,000	\$72,490,000	\$43,500,000	\$293,250,000
Preferred stock	\$79,500,000	\$42,000,000	\$51,500,000	\$52,500,000	\$14,200,000	\$11,800,000	\$182,700,000
Common stock	\$125,500,000	\$91,000,000	\$117,500,000	\$94,500,000	\$58,290,000	\$32,200,000	\$160,550,000
Amounts issued:							
Total	\$197,184,628	\$146,458,175	\$197,820,200	\$172,467,717	\$69,464,858	\$39,800,400	\$238,699,700
Bonds		\$36,944,000	\$13,805,000	\$42,461,217	\$5,567,500	\$275,000	\$322,000
Total stock	\$197,184,628	\$109,514,175	\$184,015,200	\$130,006,500	\$63,897,358	\$39,524,400	\$238,377,700
Preferred stock	\$70,844,600	\$33,417,775	\$75,282,800	\$48,115,500	\$12,532,550	\$10,027,800	\$99,394,600
Common stock	\$126,340,028	\$76,096,400	\$108,732,400	\$81,891,000	\$51,364,808	\$29,500,600	\$138,973,100

¹ The number of plants reported in this table does not agree with the number reported in Tables 1 and 2 because in a number of instances combinations operate plants engaged in different industries. In preparing this list the name of the combination has been placed in the group of industries to which it would be assigned according to its product of chief value. The number also includes 174 plants reported as idle during the census year.

Since it is impossible to present the figures for each industrial combination separately, without violating the pledge of the office that no publication of the statistics of manufactures will be made which will reveal the details of private business, the reports for the different plants were assigned to generic groups of industries, according to their products of chief value. These groups are enumerated, and the detailed statistics for each group are presented in Table 1. The grouping here employed is believed to be sufficiently minute, in most cases, to enable the Census Office to show, in its final reports, what proportion of the products represented in each group is manufactured or

controlled by industrial combinations. In a number of the industries, which are grouped under the head of "miscellaneous," there is but one industrial combination engaged in the production of the articles manufactured. In several of the other groups, but one industrial combination, as in the case of bicycles and tricycles, is engaged in the production of one or more of the different products included in the group.

In Tables 1 and 3 the groups have been arranged in accordance with their importance as gauged by the value of their products, and the following summary of Table 1 presents the general totals for each group:

SUMMARY OF STATISTICS FOR INDUSTRIAL COMBINATIONS.

	Number of combinations.	Number of plants.	Capital.	SALARIED OFFICIALS.		WAGE-EARNERS.	
				Number.	Salaries.	Average number.	Total wages.
Total.....	183	2,029	\$1,488,804,920	24,585	\$32,658,628	399,192	\$194,534,715
Iron and steel and their products.....	40	447	841,779,854	6,075	7,462,386	145,609	81,098,588
Food and allied products.....	21	273	246,623,633	4,002	4,417,444	32,958	12,326,601
Chemicals and allied products.....	14	248	175,002,887	3,015	4,364,704	27,754	12,746,006
Metals and metal products other than iron and steel.....	11	89	118,519,401	1,047	1,571,414	20,522	12,356,772
Liquors and beverages.....	28	219	118,489,158	1,151	2,406,096	7,624	4,869,457
Vehicles for land transportation.....	6	65	85,965,683	1,967	1,940,778	34,422	17,571,618
Tobacco.....	4	41	16,191,818	1,410	2,064,926	17,661	5,278,151
Textiles.....	8	72	92,468,606	1,095	1,841,913	87,723	13,297,857
Leather and its finished products.....	5	100	62,734,011	343	668,570	9,898	4,070,641
Paper and printing.....	7	116	59,271,691	1,165	1,831,528	16,706	7,478,962
Clay, glass, and stone products.....	15	180	46,878,928	1,001	1,801,159	20,294	10,994,488
Lumber and its remanufactures.....	8	61	24,470,281	615	756,783	10,778	4,889,944
Miscellaneous industries.....	16	118	45,408,869	1,699	2,030,927	17,243	8,056,140

	Miscellaneous expenses.	COST OF MATERIALS USED.				Value of products.
		Total.	Purchased in raw state.	Purchased in partially manufactured form.	Fuel, freight, etc.	
Total.....	\$151,851,077	\$1,085,083,828	\$329,762,351	\$609,313,778	\$146,007,699	\$1,661,295,364
Iron and steel and their products.....	18,067,249	325,030,784	22,979,550	246,268,885	56,382,849	508,626,482
Food and allied products.....	11,893,350	240,273,639	50,133,512	167,510,738	22,629,339	282,408,061
Chemicals and allied products.....	7,022,787	141,031,345	98,081,833	26,562,946	16,386,566	182,391,744
Metals and metal products other than iron and steel.....	2,847,356	131,020,638	59,763,215	58,864,473	12,402,950	180,154,708
Liquors and beverages.....	58,621,319	19,117,973	10,265,538	5,217,899	8,634,536	93,432,274
Vehicles for land transportation.....	3,519,070	56,600,518	45,730	47,891,179	9,163,609	85,985,533
Tobacco.....	35,119,316	28,809,804	16,035,633	3,018,207	4,755,959	74,063,029
Textiles.....	8,224,606	41,919,311	26,574,690	9,050,995	5,393,617	71,888,202
Leather and its finished products.....	1,589,760	35,468,655	33,284,055	1,446,266	733,374	45,684,329
Paper and printing.....	3,655,291	24,554,364	3,421,721	16,254,364	4,878,279	44,418,417
Clay, glass, and stone products.....	1,995,220	6,474,816	276,425	1,867,059	4,381,331	28,258,182
Lumber and its remanufactures.....	1,098,276	11,028,757	325,972	9,513,288	1,189,497	20,878,815
Miscellaneous industries.....	3,197,477	28,158,224	8,584,462	15,447,920	4,125,833	48,605,078

The arrangement by groups, as shown in the above summary, brings the iron and steel industry at the head of the table, with a gross product of \$508,626,482, which is more than double the value of the product of any other group, except that of "food and kindred products," and represents nearly one-third of the total gross value of products of all the industrial combinations. The total value of all the products of the industrial combinations reported, \$1,661,295,364, may be compared with the total gross value of all manufactured products as shown by the census of 1890, for the purpose of indicating to what extent the manufacturing industry of the country is now carried on by industrial combinations. At that census the total gross value of all manufactured products reported was \$9,372,437,283. If from this total we subtract the value of the products of the hand trades, or the mechanical and neighborhood industries, which are not susceptible to the form of management known as the industrial combination (\$1,216,165,160), we have a residuum of \$8,156,272,123, showing that the product of the industrial combinations in 1900 is equivalent to 20.4 per cent of the total gross products of the manufacturing industries of the country as they existed in 1890. When the final figures of the division of manufactures are completed, it will be possible to indicate what percentage of the total gross value of the manufactured products of the census year was comprised in the \$1,661,295,364 produced by industrial combinations.

The 183 corporations represented in the tables employed, on an average, 399,192 wage-earners during the census year, the greatest number employed at any one time during the year being 508,193, and the least number 333,164. To these employees the sum of \$194,534,715 was paid in wages. In addition to the wage-earners, employment was given to 24,585 salaried officials, clerks, etc., to whom salaries amounting to \$32,653,628 were paid. There was expended by these industrial combinations for miscellaneous expenses a total of \$151,851,077, which was distributed among the several items, as shown in Table 1. The total cost of materials utilized by industrial combinations was \$1,085,083,828. It is not to be assumed, however, that a combination of these figures of expenses subtracted from the total reported value of products is in any sense indica-

tive of the profits in the manufacture of these products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of mercantile losses incurred in the business, or of depreciation in plant. The value of the products given is the value as obtained or fixed at the shop or factory. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

The value of the products given for all the industrial combinations, \$1,661,295,364, is the gross value, and not the net or true value. The difference between these two should be carefully noted. The gross value is found by adding the values of products in the separate establishments. But the finished product of one establishment is often the raw material for another. In such cases the value of the former reappears in the latter, and thus the original cost of certain materials may be included several times in the gross value. The net or true value is found by subtracting from the gross value the value of all materials purchased in a partly manufactured form. In this way the duplications in the gross value are eliminated.

At the census of 1890 the schedule was so framed that it was impossible to find the net or true value. At the present census, the schedule asked for the value of the materials in two classes, those purchased in the crude state and those purchased in a partly manufactured form. From the answers to these questions the net or true value of products may be computed. In the case of industrial combinations the gross value of products was \$1,661,295,364. The value of material purchased in partly manufactured form was \$609,313,778; the difference between them, \$1,051,981,586, is the net or true value of products, and represents the increase in the value of the raw materials resulting from the various processes of manufacture.

Very respectfully,



Chief Statistician for Manufactures.

TABLE I.—INDUSTRIAL

	Total.	Iron and steel and their products.	Food and allied products.	Chemicals and allied products.	Metals and metal products other than iron and steel.
1 Number of combinations	183	40	21	14	11
2 Number of plants	2,029	447	278	248	89
Capital:					
3 Total	\$1,433,804,920	\$341,779,954	\$246,623,683	\$175,002,887	\$118,519,401
4 Land	\$152,266,763	\$30,849,801	\$34,020,643	\$20,846,122	\$5,106,680
5 Buildings	\$254,491,359	\$54,813,790	\$34,257,180	\$23,417,627	\$34,835,426
6 Machinery, tools, and implements	\$391,227,443	\$120,133,706	\$67,019,661	\$50,799,987	\$35,157,769
7 Cash and sundries	\$635,819,355	\$135,982,657	\$111,326,199	\$80,489,151	\$43,419,546
Salaried officials, clerks, etc.:					
8 Total number	24,585	6,075	4,002	3,015	1,017
9 Total salaries	\$32,653,628	\$7,462,396	\$4,417,444	\$4,364,704	\$1,571,414
Officers:					
10 Number	1,470	427	96	206	63
11 Salaries	\$7,146,067	\$2,012,010	\$583,464	\$963,221	\$311,305
General superintendents, managers, clerks, and salesmen:					
12 Total number	23,115	5,648	3,906	2,809	934
13 Total salaries	\$25,507,561	\$5,450,376	\$3,833,980	\$3,396,483	\$1,260,109
Men:					
14 Number	21,214	5,355	3,545	2,652	906
15 Salaries	\$24,610,664	\$5,298,039	\$3,687,888	\$3,303,786	\$1,225,147
Women:					
16 Number	1,901	293	361	157	78
17 Salaries	\$896,897	\$162,337	\$146,592	\$92,697	\$34,962
Wage-earners, including pieceworkers:					
18 Greatest number employed at any one time during the year	508,198	173,047	43,928	37,510	24,350
19 Least number employed at any one time during the year	333,164	116,303	30,833	22,426	17,271
20 Average number	399,192	145,609	32,953	27,754	20,522
21 Wages	\$194,594,715	\$31,093,583	\$12,325,601	\$12,746,006	\$12,356,772
Men, 16 years and over:					
22 Average number	342,464	142,090	20,152	26,614	19,694
23 Wages	\$180,645,881	\$30,275,226	\$9,723,766	\$12,477,248	\$12,112,921
Women, 16 years and over:					
24 Average number	45,461	2,139	11,102	918	753
25 Wages	\$11,876,043	\$335,951	\$2,374,684	\$239,869	\$223,422
Children, under 16 years:					
26 Average number	11,267	1,380	1,704	222	75
27 Wages	\$2,012,738	\$287,406	\$228,151	\$23,839	\$20,429
Average number of wage-earners, including piece-workers, employed during each month:					
Men, 16 years and over:					
28 January	341,693	137,545	16,392	29,672	19,418
29 February	343,537	138,502	15,993	29,431	19,512
30 March	352,996	142,176	16,940	29,644	19,821
31 April	346,347	138,903	17,206	29,765	19,748
32 May	345,691	138,891	21,041	23,555	19,911
33 June	333,118	136,803	22,116	22,267	18,970
34 July	317,668	134,002	23,072	22,157	17,873
35 August	336,652	146,485	23,886	23,004	19,280
36 September	343,837	149,969	23,913	25,406	19,970
37 October	350,653	150,847	23,414	27,632	20,425
38 November	352,441	148,421	21,517	30,104	20,733
39 December	344,945	142,506	16,330	29,696	20,609
Women, 16 years and over:					
40 January	40,555	2,132	5,691	936	698
41 February	41,818	2,202	5,917	910	708
42 March	42,424	2,365	6,418	914	742
43 April	42,666	2,425	6,797	934	755
44 May	45,349	2,456	10,086	919	757
45 June	45,435	2,274	13,797	901	733
46 July	48,496	1,909	17,421	850	729
47 August	51,228	2,245	18,003	844	749
48 September	51,068	2,112	17,945	917	765
49 October	49,032	1,955	14,099	970	791
50 November	45,411	1,896	10,074	976	812
51 December	41,061	1,638	6,974	950	799
Children, under 16 years:					
52 January	10,539	1,201	745	178	58
53 February	10,739	1,340	751	169	70
54 March	11,229	1,420	877	313	81
55 April	10,967	1,331	905	170	73
56 May	11,032	1,428	2,193	158	80
57 June	11,257	1,433	2,284	243	75
58 July	10,613	1,204	2,332	274	80
59 August	11,379	1,527	2,423	252	80
60 September	11,228	1,530	2,406	230	82
61 October	12,596	1,519	2,332	201	76
62 November	12,510	1,379	2,224	208	76
63 December	11,060	1,136	921	268	69
Miscellaneous expenses:					
64 Total	\$151,851,077	\$18,067,249	\$11,893,350	\$7,022,787	\$2,847,355
65 Rent of works	\$1,331,911	\$157,719	\$396,005	\$70,539	\$76,935
66 Taxes, not including internal revenue	\$4,327,023	\$974,364	\$532,633	\$709,107	\$309,552
67 Rent of offices, insurance, interest, and all sundry expenses not hitherto included.	\$144,911,188	\$16,718,700	\$10,954,502	\$6,217,621	\$2,446,166
68 Contract work	\$780,950	\$216,466	\$10,160	\$19,429	\$14,902
Materials used:					
69 Total cost	\$1,085,033,823	\$325,630,784	\$240,273,639	\$141,031,345	\$131,020,638
70 Purchased in raw state	\$329,762,351	\$32,979,550	\$50,133,512	\$38,031,333	\$39,753,215
71 Purchased in partially manufactured form	\$755,271,472	\$292,651,234	\$190,140,127	\$102,999,992	\$91,267,423
72 Fuel	\$46,722,855	\$26,304,177	\$2,921,001	\$4,505,106	\$4,314,179
73 Amount paid for rent of power and heat	\$618,843	\$35,013	\$94,184	\$512	\$35,736
74 Mill supplies	\$11,863,901	\$3,219,960	\$374,309	\$1,025,050	\$764,602
75 All other materials	\$75,113,973	\$21,022,355	\$13,362,142	\$3,072,393	\$3,129,932
76 Freight	\$11,633,027	\$3,151,339	\$277,703	\$2,182,875	\$4,123,331
77 Value of products	\$1,661,295,364	\$308,626,482	\$232,408,031	\$182,391,744	\$130,154,703

COMBINATIONS.

Liquors and beverages.	Vehicles for land transportation.	Tobacco.	Textiles.	Leather and its finished products.	Paper and printing.	Clay, glass, and stone products.	Lumber and its remanufactures.	Miscellaneous industries.	
28	6	4	8	5	7	15	8	16	1
219	65	41	72	100	116	180	61	118	2
\$118,489,158	\$85,965,683	\$16,191,818	\$92,468,606	\$62,784,011	\$59,271,691	\$46,878,928	\$24,470,281	\$45,408,869	3
\$17,389,741	\$4,489,586	\$967,817	\$8,229,686	\$8,514,721	\$8,419,241	\$6,773,476	\$1,867,885	\$5,941,924	4
\$36,589,250	\$9,985,221	\$3,323,219	\$14,216,209	\$8,284,873	\$11,088,407	\$18,589,123	\$3,548,055	\$6,594,529	5
\$20,721,753	\$13,069,713	\$3,811,606	\$25,358,281	\$6,205,435	\$20,610,416	\$12,980,653	\$4,267,997	\$11,590,517	6
\$43,788,414	\$58,471,213	\$8,589,677	\$44,665,470	\$39,729,482	\$19,168,627	\$13,585,676	\$14,786,344	\$21,881,899	7
1,151	1,967	1,410	1,095	343	1,165	1,001	615	1,699	8
\$2,406,096	\$1,940,778	\$2,064,926	\$1,841,913	\$668,570	\$1,831,523	\$1,301,159	\$756,783	\$2,030,927	9
127	32	38	72	43	69	106	33	108	10
\$619,868	\$491,134	\$267,848	\$459,576	\$248,340	\$255,897	\$349,154	\$158,900	\$430,855	11
1,024	1,885	1,872	1,023	800	1,096	895	582	1,591	12
\$1,786,228	\$1,449,644	\$1,797,588	\$1,382,337	\$420,230	\$1,575,681	\$952,005	\$602,583	\$1,600,072	13
1,010	1,635	1,810	868	298	978	791	475	1,396	14
\$1,773,689	\$1,353,403	\$1,774,948	\$1,302,756	\$417,244	\$1,513,493	\$894,363	\$549,343	\$1,507,060	15
14	250	62	155	7	118	104	107	195	16
\$7,539	\$96,241	\$22,035	\$79,581	\$2,986	\$57,133	\$57,642	\$58,540	\$93,012	17
9,907	48,347	23,193	42,725	12,175	19,882	28,861	12,127	22,141	18
6,636	25,349	13,663	38,461	8,329	14,063	21,060	9,328	13,942	19
7,624	34,422	17,661	37,723	9,898	16,706	20,294	10,778	17,243	20
\$4,869,657	\$17,571,613	\$5,278,151	\$18,297,357	\$4,070,641	\$7,478,962	\$10,994,488	\$4,389,944	\$8,056,140	21
7,455	33,764	8,396	19,577	9,877	13,145	17,409	9,283	15,005	22
\$4,839,122	\$17,380,811	\$3,215,556	\$8,114,054	\$4,066,142	\$6,546,304	\$10,361,439	\$4,034,929	\$7,499,316	23
76	346	8,234	14,246	19	3,302	1,267	1,143	1,866	24
\$15,079	\$123,141	\$1,960,579	\$4,426,770	\$4,049	\$885,584	\$306,105	\$299,658	\$481,202	25
93	812	931	3,900	2	259	1,618	349	872	26
\$15,256	\$67,661	\$102,016	\$756,533	\$460	\$48,124	\$326,894	\$53,357	\$75,622	27
7,820	36,903	8,185	19,155	9,363	13,850	19,671	9,152	15,058	28
7,427	36,403	8,912	19,445	9,548	13,831	19,826	9,089	15,618	29
8,106	35,083	9,427	19,792	9,579	13,896	20,173	9,097	16,262	30
8,261	35,372	9,012	19,319	9,683	13,851	21,377	9,407	16,943	31
7,980	35,632	9,508	18,950	10,053	13,557	20,443	9,486	16,704	32
6,916	33,678	7,637	18,682	9,561	10,915	21,103	9,115	15,365	33
6,870	30,997	7,128	18,640	9,707	11,842	13,061	8,861	13,933	34
6,991	28,579	7,984	20,287	10,112	12,288	15,111	9,083	13,562	35
7,260	28,721	7,846	20,473	10,276	12,733	14,307	9,400	13,523	36
7,894	30,184	8,060	20,777	10,387	13,430	14,635	9,623	13,865	37
7,551	33,350	8,657	19,530	10,209	13,898	14,607	9,592	14,216	38
7,423	36,769	8,396	19,877	10,066	14,148	14,590	9,524	15,011	39
69	539	7,672	14,573	27	3,788	1,412	1,183	1,845	40
66	535	8,137	14,513	34	3,649	1,438	1,180	1,970	41
76	513	8,660	14,635	33	3,600	1,434	1,200	1,835	42
89	449	8,714	14,423	34	3,512	1,367	1,159	1,983	43
81	351	8,916	14,230	23	3,322	1,013	1,159	2,036	44
92	261	7,580	14,098	11	1,557	1,024	1,116	1,986	45
87	229	7,875	13,571		2,190	725	1,093	1,817	46
84	274	7,914	13,739	2	3,470	998	1,091	1,815	47
67	317	8,123	13,870	1	3,468	1,223	1,104	1,756	48
76	221	8,634	14,218	16	3,628	1,503	1,136	1,730	49
60	235	8,720	14,471	21	3,687	1,529	1,138	1,793	50
68	232	8,459	14,610	22	3,768	1,530	1,152	1,759	51
81	387	838	3,960	2	301	2,154	334	350	52
77	339	931	3,940	2	297	2,199	321	353	53
81	361	996	3,943	2	284	2,179	338	354	54
101	376	947	3,872	2	259	2,164	319	394	55
107	312	1,011	3,871	2	230	900	320	420	56
111	277	1,029	3,855	2	213	960	350	407	57
104	257	946	3,907	2	210	433	379	375	58
108	225	979	3,908	2	186	941	303	355	59
108	222	913	3,877	2	227	926	358	347	60
82	294	1,036	3,867	2	237	2,184	365	357	61
78	352	1,039	3,876	2	298	2,197	371	361	62
78	388	1,062	3,924	2	310	2,175	363	364	63
\$58,621,819	\$3,519,070	\$35,119,316	\$3,224,606	\$1,589,760	\$3,655,291	\$1,995,220	\$1,098,276	\$3,197,477	64
\$62,733	\$49,654	\$34,713	\$56,656	\$100	\$213,141	\$5,376	\$30,589	\$162,251	65
\$521,302	\$166,988	\$147,810	\$423,115	\$182,727	\$390,355	\$155,060	\$125,080	\$189,076	66
\$58,037,284	\$2,902,428	\$34,936,793	\$2,720,648	\$1,406,933	\$3,013,842	\$1,779,204	\$925,604	\$2,821,367	67
	\$400,000		\$24,192		\$7,953	\$55,021	\$8,043	\$24,734	68
\$19,117,973	\$56,600,518	\$23,809,804	\$41,919,311	\$35,463,655	\$24,554,364	\$6,474,818	\$11,028,757	\$28,158,224	69
\$10,265,588	\$45,750	\$16,035,638	\$26,574,699	\$33,284,055	\$3,421,721	\$276,426	\$325,972	\$8,534,462	70
\$5,217,899	\$47,391,179	\$3,018,207	\$9,950,995	\$1,446,286	\$16,254,864	\$1,637,059	\$9,513,253	\$15,437,329	71
\$1,175,879	\$1,044,492	\$167,722	\$34,848	\$237,129	\$1,743,773	\$1,931,485	\$136,908	\$706,655	72
\$975	\$7,100	\$7,850	\$31,135	\$306,647	\$306,647	\$4,079	\$4,079	\$14,747	73
\$122,276	\$357,854	\$121,433	\$1,632,052	\$46,762	\$361,733	\$132,895	\$65,678	\$480,067	74
\$2,316,360	\$7,607,540	\$4,438,820	\$2,331,800	\$74,840	\$1,881,873	\$2,054,427	\$746,939	\$2,479,487	75
\$19,046	\$147,123	\$20,034	\$14,232	\$374,603	\$34,198	\$212,523	\$234,993	\$435,877	76
\$93,432,274	\$85,985,533	\$74,063,029	\$71,833,202	\$46,681,829	\$4,418,417	\$23,258,182	\$20,378,315	\$48,606,073	77

TABLE 1.—INDUSTRIAL

	Total.	Iron and steel and their products.	Food and allied products.	Chemicals and allied products.	Metals and metal products other than iron and steel.
78 Total horsepower	1,580,772	798,839	74,884	87,360	67,156
Owned:					
Engines:					
Steam:					
79 Number	8,962	8,229	788	1,442	486
80 Horsepower	1,251,107	748,085	65,027	88,384	46,814
Gas or gasoline:					
81 Number	130	34	5	9	10
82 Horsepower	8,685	1,836	48	161	323
Water wheels:					
83 Number	1,088	29	20	3	45
84 Horsepower	244,801	3,718	7,000	225	10,212
Electric motors:					
85 Number	8,031	1,852	87	90	159
86 Horsepower	57,232	86,005	1,337	8,115	3,460
Other power:					
87 Number	240	123		24	39
88 Horsepower	15,893	5,796		455	5,247
Rented, horsepower	8,104	3,949		922	20
89 Supplied to other establishments, horsepower	2,510	779	18	10	1,600
90 Establishments classified by number of employees:					
91 Total number	2,029	447	278	248	89
92 Under 5	25	2	10		3
93 5 to 20	107	3	13		11
94 21 to 50	339	19	40	14	8
95 51 to 100	429	62	57	80	14
96 101 to 250	553	137	99	63	24
97 251 to 500	278	118	28	25	13
98 501 to 1,000	228	71	23	12	10
99 Over 1,000	70	85	8	1	6

TABLE 2.—MANUFACTURES IN INDUSTRIAL

STATES AND TERRITORIES.	Number of plants.	CAPITAL.					SALARIED OFFICIALS, CLERKS, ETC.		AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.			
		Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.	Number.	Salaries.	Total.		Men, 16 years and over.	
									Average number.	Wages.	Average number.	Wages.
1 Total	2,029	\$1,433,804,920	\$152,266,763	\$254,491,359	\$391,227,443	\$635,819,355	24,685	\$32,653,628	399,192	\$194,584,715	342,464	\$180,645,884
2 Alabama	25	9,858,740	588,429	2,745,826	2,504,812	4,019,678	230	281,064	6,296	2,010,145	5,728	1,942,675
3 California	46	10,092,354	1,137,230	1,700,691	3,087,272	4,167,155	253	272,404	4,209	1,520,201	1,384	739,065
4 Colorado	11	21,371,539	721,002	6,663,436	8,951,834	5,032,206	168	303,732	2,802	2,006,512	2,728	1,985,580
5 Connecticut	50	41,137,504	2,384,814	3,024,796	12,140,896	18,587,053	949	1,225,217	14,462	7,066,886	11,374	6,197,906
6 Delaware	6	3,012,805	274,824	561,482	964,975	1,211,524	73	81,927	1,628	781,931	1,599	774,288
7 Georgia	18	5,659,161	231,005	1,037,824	800,899	3,589,438	97	158,365	1,182	335,539	1,182	335,539
8 Illinois	163	157,342,806	31,659,387	32,885,260	43,651,999	49,046,100	2,799	3,376,689	41,497	23,086,359	39,158	22,512,729
9 Indiana	100	45,840,908	3,185,704	7,589,175	15,377,502	19,238,527	1,008	1,173,655	19,711	10,985,199	18,304	10,672,848
10 Iowa	16	13,884,333	8,073,100	3,726,100	4,376,169	2,202,844	171	217,224	1,768	729,612	1,309	644,329
11 Kansas	31	12,382,612	411,649	4,196,995	4,881,496	2,892,472	103	65,227	1,013	450,965	991	446,255
12 Kentucky	50	10,441,628	1,137,020	1,705,601	3,404,426	4,104,581	355	468,524	4,507	1,688,583	3,798	1,568,965
13 Louisiana	20	22,410,410	2,330,664	2,528,139	4,496,898	13,054,709	239	340,755	8,205	1,123,111	2,562	1,011,214
14 Maine	79	14,710,447	1,038,300	1,989,007	3,734,119	7,949,021	268	387,397	6,569	1,842,200	4,180	1,519,360
15 Maryland	70	33,481,205	3,127,424	12,926,452	7,007,913	10,419,416	621	926,188	10,392	3,294,666	6,228	2,850,684
16 Massachusetts	123	118,622,094	9,302,285	14,072,295	29,388,688	65,308,826	1,846	2,621,804	38,801	17,075,415	26,897	18,479,745
17 Michigan	31	19,033,339	2,302,070	3,250,423	3,924,929	9,555,917	457	599,337	8,955	3,981,652	8,002	3,746,274
18 Minnesota	18	12,255,415	646,109	1,187,423	5,529,830	4,896,044	272	379,306	2,782	1,114,476	2,251	1,028,140
19 Missouri	41	24,899,297	2,373,688	5,878,166	6,975,745	10,161,695	1,067	1,288,775	9,890	4,179,959	7,202	3,586,144
20 Montana	4	24,762,018	191,981	3,538,134	3,322,869	12,709,034	79	172,196	3,689	3,633,217	3,632	3,013,620
21 Nebraska	9	19,155,378	1,248,180	5,695,916	7,845,527	4,365,776	80	120,022	1,035	567,464	972	544,678
22 New Hampshire	9	5,883,444	872,049	1,093,000	1,394,477	2,023,918	78	121,566	2,071	778,605	1,761	671,480
23 New Jersey	75	80,582,879	8,611,124	10,333,278	20,720,836	40,908,641	1,104	1,645,499	18,258	6,991,501	11,947	6,625,863
24 New York	227	201,705,908	28,506,169	28,923,246	49,006,466	95,270,927	3,465	4,978,377	36,844	17,085,478	31,122	15,064,198
25 North Carolina	7	1,601,494	150,119	470,044	375,402	605,929	112	233,697	1,390	251,898	800	173,325
26 Ohio	225	131,826,823	10,218,215	21,426,266	51,529,656	48,652,696	2,519	3,133,744	47,623	25,705,082	44,519	24,978,509
27 Oregon	9	2,302,229	115,000	1,445,000	859,584	382,645	32	48,800	392	136,874	342	126,691
28 Pennsylvania	358	289,895,305	27,432,966	44,899,803	69,889,463	147,673,078	4,302	5,652,661	78,178	43,447,674	74,321	42,660,185
29 Rhode Island	18	18,717,005	2,184,916	2,334,961	5,387,879	8,209,239	255	439,726	7,509	3,049,822	4,305	2,056,972
30 South Carolina	17	11,719,339	115,901	1,992,774	1,804,862	5,490,825	78	162,316	2,463	660,651	2,122	533,109
31 Tennessee	21	6,688,444	752,778	1,189,212	1,740,801	3,005,658	146	159,897	1,887	544,844	1,794	525,416
32 Texas	18	6,892,957	873,045	1,323,914	2,751,985	1,944,013	153	187,725	1,986	735,787	1,960	727,877
33 Virginia	26	6,594,074	409,683	1,736,335	4,490,525	3,497,581	273	432,572	5,169	1,132,707	2,926	785,921
34 West Virginia	22	18,263,047	994,195	2,710,714	3,485,980	6,122,158	190	260,085	5,148	2,542,648	4,926	2,493,307
35 Wisconsin	42	26,124,868	3,203,189	4,743,958	5,490,825	12,686,891	504	629,192	7,445	3,213,583	6,492	3,027,569
36 All other states ¹	41	11,178,037	1,056,463	2,815,663	3,881,885	3,419,056	200	297,860	3,876	1,609,549	3,637	1,529,139

¹ Includes following plants, grouped in order to avoid disclosing the operations of individual companies: Arkansas, 2; District of Columbia, 1; Florida, 1; Mississippi, 2; Oklahoma, 1; Utah, 2; Vermont, 2; and Washington, 2.

COMBINATIONS—Continued.

Liquors and beverages.	Vehicles for land transportation.	Tobacco.	Textiles.	Leather and its finished products.	Paper and printing.	Clay, glass, and stone products.	Lumber and its remanufactures.	Miscellaneous industries.	
44,886	87,872	9,799	87,616	21,698	241,368	56,254	11,788	41,807	78
788	244	87	322	343	398	528	111	851	79
41,612	84,622	8,142	56,709	21,117	48,691	50,295	11,476	35,784	80
1	4	2		11	2	20	2	30	81
20	66	62		521	19	609	47	423	82
1	2	6	165	1	785	29	3	9	83
80	180	235	27,855	60	191,645	2,630	115	946	84
155	89	146	55		162	99	2	135	85
8,183	2,189	1,132	2,671		880	2,320	22	1,418	86
1	6	1			4	14	2	26	87
60	615	100			160	850	10	8,100	88
31	250	128	381		568		119	136	89
	80	426	60		1,045		80	13	90
219	65	41	72	100	116	180	61	118	91
				1			1	8	92
29		1			2	9	7	18	93
129		1	1	15	15	27	5	26	94
47	5	7	3	41	22	55	19	17	95
18	17	8	12	36	56	58	14	16	96
	15	7	8	5	5	19	9	15	97
1	15	12	42	2	16	12	5	18	98
	18	5	6				1	15	99

COMBINATIONS, BY STATES AND TERRITORIES.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES—continued.				MISCELLANEOUS EXPENSES.					COST OF MATERIALS USED.				Value of products, including custom work and repairing.
Women, 16 years and over.		Children, under 16 years.		Total.	Rent of works.	Taxes, not including internal revenue.	Rent of offices, interest, etc.	Contract work.	Total.	Principal materials, including mill supplies and freight.	Fuel and rent of power and heat.		
Average number.	Wages.	Average number.	Wages.										
45,461	\$11,876,043	11,267	\$2,012,788	\$151,851,077	\$1,831,911	\$4,827,028	\$144,611,188	\$780,950	\$1,085,083,828	\$1,087,742,030	\$47,841,798	\$1,661,295,864	
222	36,439	846	81,031	448,795	500	44,006	858,412	50,877	6,402,051	4,597,090	804,961	9,342,992	2
2,817	778,655	8	2,461	1,080,181	26,818	48,329	1,009,984		6,354,489	6,157,567	196,902	10,225,725	3
74	19,922			211,607	7,880	32,952	171,776		26,826,814	25,649,717	1,177,097	31,454,732	4
2,731	811,201	357	57,779	2,150,781	13,590	165,107	1,961,071	10,968	30,253,967	29,548,000	705,958	45,285,735	5
14	4,243	15	8,400	173,177		4,534	168,643		2,847,565	2,774,290	73,275	4,139,498	6
				278,898		84,247	244,146		1,967,720	1,921,198	46,522	2,828,100	7
1,676	412,790	663	110,840	89,050,996	184,145	465,570	38,863,223	48,058	111,549,727	103,035,125	8,514,602	195,146,027	8
705	164,408	702	148,443	10,241,340	21,519	139,857	10,076,964	4,000	39,927,110	38,270,772	1,656,338	69,216,231	9
423	80,725	36	4,558	429,658	7,659	16,153	404,483	1,863	7,269,603	7,001,446	268,162	3,950,547	10
21	4,510	1	200	199,807	4,050	15,370	180,387		16,811,621	16,581,864	229,757	22,331,661	11
400	108,473	249	21,145	5,777,723	6,794	49,551	5,721,878		7,655,307	7,278,387	876,920	17,422,553	12
667	104,589	36	7,208	1,663,849	17,803	129,325	1,408,424	3,797	23,451,253	23,107,962	346,331	26,658,568	13
1,589	232,069	791	80,771	655,498	2,386	68,795	479,984	9,333	5,241,012	4,915,823	325,689	9,112,005	14
8,055	734,667	1,109	109,315	5,178,468	42,891	107,608	5,028,069		18,114,313	12,719,749	394,564	25,930,702	15
10,878	3,134,196	1,528	411,474	5,565,859	97,157	638,093	4,818,693	12,416	64,510,139	62,760,044	1,750,095	102,921,247	16
777	158,585	176	26,793	2,260,866	14,466	98,983	2,147,417		14,653,015	14,248,228	400,787	23,694,891	17
481	80,066			639,603	18,713	32,284	588,606		20,977,537	20,728,635	248,902	24,571,960	18
2,081	597,925	97	25,920	13,008,528	31,998	123,909	12,850,498	2,123	23,256,381	22,828,787	427,594	46,742,416	19
29	7,442	23	12,155	411,642	26,000	119,915	251,822	14,902	22,419,105	21,197,225	1,221,880	35,899,006	20
103	19,653	10	8,153	2,203,295	4,026	19,531	2,179,688		15,370,130	15,070,740	293,440	27,885,769	21
803	100,845	7	1,840	251,099	767	38,975	207,599	3,848	2,600,230	2,389,222	211,008	4,592,962	22
1,137	934,895	174	30,738	4,916,975	45,398	228,958	4,646,385	734	60,321,769	58,748,558	1,572,911	79,677,430	23
4,905	1,227,341	517	148,939	16,822,287	408,006	637,817	15,117,416	108,938	168,224,028	160,187,875	8,036,153	217,360,369	24
431	67,576	159	10,437	2,291,632	10,649	2,231,033	2,231,033		2,236,259	2,155,066	81,193	6,143,885	25
2,704	651,170	400	30,303	11,253,514	74,191	400,326	10,771,192	12,365	109,330,920	101,030,936	8,348,984	173,120,428	26
25	4,700	25	5,483	26,956	2,026	4,559	20,371		844,209	834,638	9,571	1,145,766	27
1,794	386,687	2,063	394,732	14,965,702	191,437	656,131	13,644,252	474,882	215,168,360	204,923,798	10,239,562	326,309,151	28
2,529	888,198	675	105,654	570,237	46,099	57,902	460,508	6,788	7,478,147	7,240,473	237,674	13,225,699	29
178	26,346	133	15,628	697,760	49,269	648,491	648,491		3,378,246	3,272,373	105,873	5,418,477	30
83	16,155	10	2,278	359,106	6,540	35,959	316,607		3,924,735	3,722,473	202,262	5,623,205	31
16	6,070	10	2,840	624,210	1,620	19,091	608,499		7,706,000	7,265,450	440,650	10,041,150	32
1,976	378,590	267	23,196	3,801,600	3,556	50,571	3,745,108	2,370	4,714,374	3,923,798	791,715	11,805,246	33
66	14,176	156	35,165	384,511	600	45,965	337,098	850	13,791,953	12,338,933	953,020	20,858,551	34
763	152,990	185	33,084	2,943,227	19,879	147,402	2,772,156	4,298	20,156,271	19,203,067	953,204	80,907,714	35
233	78,668	6	1,752	1,011,785	6,337	65,432	986,466	3,000	10,296,298	9,614,056	682,242	15,130,993	36

TABLE 3.—CAPITALIZATION,

NAME OF COMBINATION.	LOCATION OF CENTRAL OFFICE.	DATE OF ORGANIZATION.	Number of plants controlled.	CAPITALIZATION.			
				Amounts authorized by charter.			
				Bonds.	Stock.		
		Total.	Preferred.	Common.			
Total for all groups			12,208	\$270,127,250	\$3,337,411,950	\$1,259,540,900	\$2,077,871,050
Iron and steel and their products, total.			1,489	25,949,000	952,850,000	430,350,000	522,500,000
1 Alabama Consolidated Coal and Iron Co.	Equitable Bldg., Baltimore, Md.	July 19, 1899	4		5,000,000	2,500,000	2,500,000
2 American Axe and Tool Co.	253 Broadway, New York City	December 1, 1889	6		2,000,000		2,000,000
3 American Bridge Co.	100 Broadway, New York City	April 14, 1900	24		70,000,000	35,000,000	35,000,000
4 American Iron and Steel Mfg. Co.	Lebanon, Pa.	August 21, 1899	5		20,000,000	3,000,000	17,000,000
5 American Ordnance Co.	718 Crescent Ave., Bridgeport, Conn.	December 31, 1895.	2		2,500,000	1,000,000	1,500,000
6 American Radiator Co.	Lake and Dearborn Sts., Chicago, Ill.	February 10, 1899.	9		10,000,000	5,000,000	5,000,000
7 American Sheet Steel Co.	Battery Park Bldg., New York City	March 28, 1900	29		55,000,000	28,500,000	26,500,000
8 American Steel and Wire Co. of New Jersey.	Rookery Bldg., Chicago, Ill.	January 13, 1899	42		90,000,000	40,000,000	50,000,000
9 American Steel Casting Co.	Chester, Pa.	February 23, 1894.	6	490,000	4,200,000	1,450,000	2,750,000
10 American Steel Hoop Co.	Carnegie Bldg., Pittsburg, Pa.	April 14, 1899	15		33,000,000	14,000,000	19,000,000
11 American Tin Plate Co.	24 State St., New York City	December 15, 1898.	65		50,000,000	20,000,000	30,000,000
12 American Wood Working Machine Co.	136 Liberty St., New York City	November 20, 1897	3	2,000,000	4,000,000	2,000,000	2,000,000
13 Atlas Tack Co.	Taunton, Mass.	June 1, 1891	4	1,250,000	700,000		700,000
14 Central Foundry Co.	116 Nassau St., New York City	July 15, 1899	14	4,000,000	14,000,000	7,000,000	7,000,000
15 Continental Gin Co.	Birmingham, Ala.	November 27, 1899	6	760,000	3,000,000		3,000,000
16 Empire Steel and Iron Co.	Empire Bldg., New York City	March 14, 1899	10		5,000,000	2,500,000	2,500,000
17 Federal Steel Co.	Empire Bldg., New York City	September 9, 1898.	17		200,000,000	100,000,000	100,000,000
18 Herring-Hall-Marvin Co.	400 Broadway, New York City	June, 1892 ⁵	2		3,800,000	1,800,000	1,500,000
19 International Heater Co.	Park Ave. and Erie Canal, Utica, N. Y.	July 1, 1898.	2		1,800,000	800,000	900,000
20 International Power Co.	253 Broadway, New York City	January 14, 1899	2	225,000	3,000,000	600,000	7,400,000
21 International Steam Pump Co.	26 Broadway, New York City	March 24, 1899	6		27,500,000	12,500,000	15,000,000
22 National Enameling and Stamping Co.	81-83 Fulton St., New York City	January 29, 1899	10		30,000,000	10,000,000	20,000,000
23 National Malleable Castings Co.	Cleveland, Ohio	January 30, 1891	4		3,000,000		3,000,000
24 National Saw Co.	Newark, N. J.	May 23, 1890	4		1,000,000	600,000	400,000
25 National Shear Co.	Fremont, Ohio	1893 ⁽⁶⁾	3		3,000,000	1,500,000	1,500,000
26 National Steel Co.	Carnegie Bldg., Pittsburg, Pa.	February 25, 1899.	22	4,434,000	59,000,000	27,000,000	32,000,000
27 National Tube Co.	Haymeyer Bldg., New York City	June 16, 1899	26		80,000,000	40,000,000	40,000,000
28 Niles-Bement-Pond Co.	136 Liberty St., New York City	August 11, 1899	4		3,000,000	3,000,000	5,000,000
29 Ohio Tool Co. of Auburn, N. Y.	Columbus, Ohio	September 12, 1899	2		850,000		350,000
30 Otis Elevator Co.	71 Broadway, New York City	November 23, 1898	6		11,000,000	4,500,000	6,500,000
31 Pittsburg Stone and Range Co.	610-612 Wood St., Pittsburg, Pa.	September 1, 1899.	3		2,000,000	1,000,000	1,000,000
32 Republic Iron and Steel Co.	Stock Exchange Bldg., Chicago, Ill.	May 3, 1899	35		55,000,000	25,000,000	30,000,000
33 Shelby Steel Tube Co.	American Trust Bldg., Cleveland, O.	February 9, 1900	14		15,000,000	6,000,000	9,000,000
34 Standard Chain Co.	First Nat'l Bank Bldg., Pittsburg, Pa.	February 2, 1900	11	700,000	3,000,000	1,500,000	1,500,000
35 Steel Tire Wheel Co.	New York City	January 26, 1897	5		4,000,000	2,000,000	2,000,000
36 Susquehanna Iron and Steel Co.	Columbia, Pa.	June, 1899	7		1,500,000		1,500,000
37 United Shoe Machinery Co.	205 Lincoln St., Boston, Mass.	February 8, 1899	5		25,000,000	12,500,000	12,500,000
38 United States Cast Iron Pipe and Foundry Co.	80 Broadway, New York City	March 13, 1899	17	1,500,000	30,000,000	15,000,000	15,000,000
39 Virginia Iron, Coal, and Coke Co.	Bristol, Va.-Tenn.	January 2, 1899	21	10,000,000	10,000,000		10,000,000
40 Wheeling Steel and Iron Co.	Wheeling, W. Va.	April 16, 1892	7	600,000	5,000,000	5,000,000	
Food and allied products, total			1,277	32,943,750	805,875,000	130,425,000	175,450,000
1 American Beet Sugar Co.	82 Nassau St., New York City	March 24, 1899	4		20,000,000	5,000,000	15,000,000
2 American Caramel Co.	20 E. Allen St., Philadelphia, Pa.	March 23, 1898.	2	600,000	2,000,000	1,000,000	1,000,000
3 American Cereal Co.	1340 Monadnock Bldg., Chicago, Ill.	June, 1891	6	1,600,000	3,400,000		3,400,000
4 American Cicle Co.	Park Row Bldg., New York City	June 3, 1899	6		9,000,000	3,000,000	6,000,000
5 American Pastry and Manufacturing Co.	Broadway, Thirty-sixth St., and Sixth Ave., New York City.	July 7, 1899	6		3,000,000	1,000,000	2,000,000
6 American Preserve Co.	950 Beach St., Philadelphia, Pa.	December 21, 1897.	1		125,000		125,000
7 American Sugar Refining Co.	117 Wall St., New York City	January 10, 1891	5	10,000,000	75,000,000	37,500,000	37,500,000
8 California Fruit Cannery Ass'n	203 California St., San Francisco, Cal.	July 3, 1899	20		3,500,000		3,500,000
9 Columbia River Packers' Ass'n	Astoria, Ore.	February, 1899	4		2,000,000		2,000,000
10 Continental Biscuit Co.	Chicago, Ill.	June 15, 1898.	5		500,000		500,000
11 Continental Creamery Co.	523 Jackson St., Topeka, Kans.	March 1, 1900	13		500,000	500,000	
12 Glucose Sugar Refining Co.	845 Rookery Bldg., Chicago, Ill.	August 3, 1897	5		40,000,000	14,000,000	26,000,000
13 National Biscuit Co.	205 La Salle St., Chicago, Ill.	February 3, 1898.	95		55,000,000	25,000,000	30,000,000
14 National Rice Milling Co.	542 Montegut St., New Orleans, La.	May, 1892 ⁷	5		5,000,000	2,000,000	3,000,000
15 National Sugar Refining Co.	109 Wall St., New York City	June 2, 1900.	3		20,000,000	10,000,000	10,000,000
16 Pacific Coast Biscuit Co.	Seattle, Wash.	September 15, 1899.	12	1,500,000	4,000,000	1,500,000	2,500,000
17 Pillsbury-Washburn Flour Mills Co., Ltd.	301 Guaranty Bldg., Minneapolis, Minn.	October, 1899	5	4,243,750	4,850,000	2,425,000	2,425,000
18 Royal Baking Powder Co.	100 William St., New York City	March 1, 1899	3		20,000,000	10,000,000	10,000,000
19 Seacoast Packing Co.	Royal Ins. Bldg., Chicago, Ill.	April 5, 1899	39		3,000,000	3,000,000	3,000,000
20 Standard Sardine Co.	Eastport, Me.	March 6, 1899	25		5,000,000	2,000,000	3,000,000
21 United States Flour Milling Co.	207 Produce Exchange, New York City.	April 27, 1899	16	15,000,000	25,000,000	12,500,000	12,500,000

¹ The number of plants reported in this table does not agree with the number reported in Tables 1 and 2, because in a number of instances combinations operate plants engaged in different industries. In preparing this list the name of the combination has been placed in the group of industries to which it would be assigned according to its product of chief value. The number also includes 174 plants reported as idle during the census year.

² Declined to furnish information.

³ Went into receivership in 1899.

⁴ Reorganized July 18, 1900.

⁵ Reorganized as Herring-Hall-Marvin Safe Co., August 2, 1900.

AND DIVIDENDS PAID.

CAPITALIZATION—continued.				DIVIDENDS PAID DURING CENSUS YEAR.					
Amounts issued.									
Bonds.	Stock.			Rate.		Total.	On preferred stock.	On common stock.	
	Total.	Preferred.	Common.	On preferred.	On common.				
\$216,412,769	\$2,868,788,109	\$1,066,625,963	\$1,802,262,146						
20,614,000	763,806,295	349,763,485	414,042,810						
	4,944,800	2,463,200	2,481,600	7 per cent.	None	\$172,424	\$172,424		1
	1,036,250		1,036,250	(²)					2
	61,055,600	30,527,800	30,527,800	None	None				3
	4,700,000	3,000,000	1,700,000	5 per cent.	20 per cent.	465,000	125,000	\$340,000	4
	2,491,800	1,000,000	1,491,800	None	None				5
	7,893,000	3,000,000	4,893,000	7 per cent.	None	210,000	210,000		6
	49,000,000	24,500,000	24,500,000	None	None				7
	90,000,000	40,000,000	50,000,000	7 per cent.	5 per cent.	4,050,000	2,800,000	1,250,000	8
490,000	8,406,800	1,195,700	2,211,100	7 per cent.	6 per cent.	216,365	83,699	132,666	9
	33,000,000	14,000,000	19,000,000	7 per cent.	None	980,000	980,000		10
	46,325,000	18,325,000	28,000,000	7 per cent.	None	1,282,750	1,282,750		11
1,232,000	8,445,000	1,760,000	1,685,000	None	None				12
232,000	700,000		700,000	None	None				13
4,000,000	14,000,000	7,000,000	7,000,000	None	None				14
	2,000,000		2,000,000	None	None				15
	4,649,500	2,368,100	2,281,400	6 per cent.	None	142,086	142,086		16
	99,745,200	53,260,900	46,484,300	6 per cent.	3½ per cent.	4,938,815	3,195,654	1,743,161	17
	3,300,000	1,800,000	1,500,000	None	None				18
	1,095,800	551,900	543,900						19
225,000	8,000,000	600,000	7,400,000	6 per cent.	None	360,000	360,000		20
	18,850,000	8,850,000	5,000,000	6 per cent.	None	581,000	581,000		21
	21,695,700	7,658,600	14,038,100	7 per cent.	None	586,102	586,102		22
	3,000,000		3,000,000	None	None				23
	1,000,000	600,000	400,000	4 per cent.	None	24,000	24,000		24
									25
2,811,000	59,000,000	27,000,000	32,000,000	7 per cent.	None	1,890,000	1,890,000		26
	80,000,000	40,000,000	40,000,000	7 per cent.	None	2,800,000	2,800,000		27
	7,000,000	2,000,000	5,000,000	6 per cent.	None	120,000	120,000		28
	350,000		350,000	None	None				29
	10,850,100	4,500,000	6,350,100	6 per cent.	None	270,000	270,000		30
	1,991,150	994,500	996,650	7 per cent.	None	52,500	52,500		31
	48,204,000	20,852,000	27,352,000	7 per cent.	None	1,459,640	1,459,640		32
	13,150,500	5,000,000	8,150,500	3½ per cent.	None	175,000	175,000		33
608,000	2,268,600	1,001,400	1,267,200	None	None				34
	3,346,800	1,444,800	1,902,500	3 per cent.	3 per cent.	100,404	48,829	57,075	35
	1,500,000		1,500,000		18 per cent.	270,000		270,000	36
1,500,000	18,261,495	9,331,885	8,930,110	6 per cent.	3 per cent.	1,249,935	537,251	711,784	37
	25,000,000	12,500,000	12,500,000	3½ per cent.	None	487,500	487,500		38
8,940,000	8,970,000		8,970,000		None				39
576,000	2,678,700	2,678,700		8 per cent. ⁸		199,334	199,334		40
12,725,900	277,618,300	117,337,600	160,280,700						
	19,000,000	4,000,000	15,000,000	6 per cent.	None	240,000	240,000		1
500,000	2,000,000	1,000,000	1,000,000	8 per cent.	None	80,000	80,000		2
1,187,300	3,341,700		3,341,700	8 per cent.		267,336		267,336	3
	9,000,000	3,000,000	6,000,000	6 per cent.	8½ per cent.	690,000	180,000	510,000	4
	2,993,100	993,100	2,000,000	None	None				5
	125,000		125,000		6 per cent.	7,500		7,500	6
	73,936,000	36,968,000	36,968,000	7 per cent.	9 per cent.	5,914,880	2,587,760	3,327,120	7
	2,780,500		2,780,500		80c. per share monthly.	83,175		83,175	8
	1,725,000		1,725,000		2½ per cent.	43,125		43,125	9
	350,000		350,000		7 per cent.	24,500		24,500	10
	410,000	410,000		None					11
	36,646,600	12,619,300	24,027,300	7 per cent.	6 per cent.	2,360,628	919,006	1,441,622	12
	53,028,700	23,792,700	29,236,000	7 per cent.	4 per cent.	2,840,193	1,670,753	1,169,440	13
	3,187,000	1,320,000	1,867,000	None	None				14
	20,000,000	10,000,000	10,000,000	None	None				15
1,000,000	2,850,000	900,000	1,950,000	None	None				16
4,034,800	4,850,000	2,425,000	2,425,000	8 per cent.	4 per cent.	291,000	194,000	97,000	17
	20,000,000	10,000,000	10,000,000	6 per cent.	None	600,000	600,000		18
	8,000,000	3,000,000	5,000,000	None	None				19
	5,000,000	2,000,000	3,000,000	None	None				20
6,004,000	3,394,700	4,909,500	3,485,200	None	None				21

⁶ Went into bankruptcy during census year and is now out of existence.
⁷ A reserve fund of \$2,400,000, equal to a 6 per cent dividend on the common stock, was set aside out of the profits of that year, and cash for the same was on deposit in banks on June 30, 1900.
⁸ Also a 10 per cent stock dividend of \$245,200.
⁹ Reorganized in December, 1900.
¹⁰ Now out of business.

TABLE 3.—CAPITALIZATION,

NAME OF COMBINATION.	LOCATION OF CENTRAL OFFICE.	DATE OF ORGANIZATION.	Number of plants controlled.	CAPITALIZATION.			
				Amounts authorized by charter.			
				Bonds.	Stock.		
Total.	Preferred.	Common.					
Chemicals and allied products, total.			1 295	\$13,750,000	\$849,299,400	\$103,812,300	\$245,487,109
1 American Agricultural Chemical Co.	26 Broadway, New York City	April, 1899	27		40,000,000	20,000,000	20,000,000
2 American Cotton Oil Co.	27 Beaver St., New York City	October 14, 1889	57	5,000,000	84,799,400	14,562,300	20,237,100
3 American Linseed Co.	100 William St., New York City	December 5, 1898	47		83,500,000	16,750,000	16,750,000
4 Barrett Manufacturing Co., The	1305 Land Title Bldg., Philadelphia, Pa.	January 1, 1896	12	2,500,000	5,000,000		5,000,000
5 Celluloid Co., The	30-36 Washington Pl., New York City	November 23, 1890	1		6,000,000		6,000,000
6 Continental Cotton Oil Co.	45 Cedar St., New York City	April 2, 1899	7		6,000,000	3,000,000	3,000,000
7 Fisheries Co., The	135 Front St., New York City	May 25, 1900	5	500,000	3,000,000	2,000,000	1,000,000
8 General Chemical Co.	25 Broad St., New York City	February 14, 1899	17		25,000,000	12,500,000	12,500,000
9 Grasselli Chemical Co.	784 The Arcade, Cleveland, Ohio	June 10, 1885	7		7,500,000		7,500,000
10 National Salt Co.	26 Broadway, New York City	March 18, 1899	31		12,000,000	5,000,000	7,000,000
11 National Starch Manufacturing Co.	1 Broadway, New York City	April 12, 1890 ²	22	4,500,000	10,500,000	5,500,000	5,000,000
12 Standard Oil Co.	26 Broadway, New York City	August 1, 1882	26		110,000,000	10,000,000	100,000,000
13 United Starch Co.	24 State St., New York City	August 31, 1899 ²	3	1,250,000	6,000,000	2,500,000	3,500,000
14 Virginia-Carolina Chemical Co.	Crenshaw Warehouse, Richmond, Va.	September 12, 1895	33		50,000,000	12,000,000	38,000,000
Metals and metal products other than iron and steel, total.			1 113	10,300,000	235,600,000	60,500,000	175,100,000
1 Amalgamated Copper Co.	52 Broadway, New York City	April 27, 1899	4		75,000,000		75,000,000
2 American Brass Co.	Waterbury, Conn.	March 1, 1899	4		20,000,000		20,000,000
3 American Shot and Lead Co.	902 Security Bldg., St. Louis, Mo.	August 27, 1890	12		3,000,000		3,000,000
4 American Smelting and Refining Co.	71 Broadway, New York City	April 4, 1899	18		65,000,000	32,500,000	32,500,000
5 American Type Founders Co.	25 William St., New York City	February 8, 1892	12	1,000,000	4,000,000		4,000,000
6 Cherokee-Lanyon Spelter Co.	Laclede Bldg., St. Louis, Mo.	January 1, 1896	14	600,000	600,000		600,000
7 International Silver Co.	Meriden, Conn.	November 19, 1898	13	4,500,000	20,000,000	9,000,000	11,000,000
8 Magnis Metal Co.	530 Ellicott Sq., Buffalo, N. Y.	June, 1899	5		8,000,000	1,500,000	1,500,000
9 National Lead Co.	100 William St., New York City	December 7, 1891	17		30,000,000	15,000,000	15,000,000
10 New Jersey Zinc Co.	71 Broadway, New York City	June 30, 1880	3	1,700,000	10,000,000		10,000,000
11 Standard Sanitary Manufacturing Co.	631-633 Wood St., Pittsburg, Pa.	January 1, 1900	6	2,500,000	5,000,000	2,500,000	2,500,000
Liquors and beverages, total.			1 258	64,584,500	212,547,550	66,253,600	146,293,950
1 American Distributing Co.	27 William St., New York City	August 10, 1891	2		5,000,000		5,000,000
2 American Maltng Co.	Sixty-third St. and E. River, New York City	September, 1897	36	5,000,000	30,000,000	15,000,000	15,000,000
3 American Spirits Manufacturing Co.	27 William St., New York City	August 22, 1895	13	2,000,000	35,000,000	7,000,000	28,000,000
4 California Wine Association	661-671 Third St., San Francisco, Cal.	August 10, 1894	9		10,000,000		10,000,000
5 Chicago Breweries, Ltd.	Chicago, Ill.	April, 1889	2	1,948,000	3,000,000		3,000,000
6 Chicago Consolidated Brewing and Maltng Co.	1422 Monadnock Bldg., Chicago, Ill.	June, 1890	4	3,166,000	5,000,000		5,000,000
7 Cleveland and Sandusky Brewing Co.	Cleveland, Ohio	June 7, 1898	9	6,000,000	6,000,000	3,000,000	3,000,000
8 Connecticut Breweries Co., Ltd.	Bridgeport, Conn.	1890	2		700,000		700,000
9 Consumers Brewing Co.*	Philadelphia, Pa.	October 26, 1896	5	1,900,000	3,800,000	1,900,000	1,900,000
10 Erie Brewing Co.	Erie, Pa.	March 20, 1899	4	1,000,000	1,500,000	500,000	1,000,000
11 Evansville Brewing Ass'n.	Fifth and Ingle Sts., Evansville, Ind.	March, 1894	2	500,000	400,000		400,000
12 Indianapolis Brewing Co. ⁶	820 High St., Indianapolis, Ind.		3				
13 Kentucky Distilleries and Warehouse Co.	27 William St., New York City	February 3, 1899	5	5,000,000	32,000,000	12,000,000	20,000,000
14 Maryland Brewing Co.	Brewers' Exch. Bldg., Baltimore, Md.	December 23, 1898	16	7,500,000	6,500,000	3,250,000	3,250,000
15 New Orleans Brewing Co.	New Orleans, La.	October 6, 1899	4	300,000	2,700,000	1,100,000	1,600,000
16 New York and Kentucky Co.	67 Lake Ave., Rochester, N. Y.	January 25, 1900	3		2,000,000	1,000,000	1,000,000
17 Paterson Brewing and Maltng Co.	Paterson, N. J.	July 1, 1899	6	3,000,000	3,000,000		3,000,000
18 Pennsylvania Central Brewing Co.	431 N. Seventh St., Scranton, Pa.	August 23, 1897	12	2,800,000	5,600,000	2,800,000	2,800,000
19 Pittsburg Brewing Co.	Pittsburg, Pa.	February 4, 1899	18	6,500,000	13,000,000	6,500,000	6,500,000
20 St. Louis Brewing Ass'n.	Wainwright Bldg., St. Louis, Mo.	June 1, 1889	11	5,250,000	5,250,000		5,250,000
21 San Francisco Breweries, Ltd.	240 Second St., San Francisco, Cal.	April 30, 1899	6	2,425,000	1,023,300	611,100	412,200
22 Seattle Brewing and Maltng Co.	Seattle, Wash.	1893	3		1,000,000		1,000,000
23 Springfield Breweries, Ltd.	Springfield, Ohio	June 1, 1890	2	145,500	509,250	242,500	266,750
24 Springfield Breweries Co.	Springfield, Mass.	April 19, 1899	3	1,150,000	1,375,000	1,250,000	125,000
25 Standard Distilling and Distributing Co.	27 William St., New York City	June 27, 1898	10		24,000,000	8,000,000	16,000,000
26 United Breweries Co.	Stock Exch. Bldg., Chicago, Ill.	August 8, 1898	12	3,500,000	5,600,000		5,600,000
27 United States Brewing Co., Ltd.	783 Broad St., Newark, N. J.	1889	5	2,000,000	3,500,000	1,750,000	1,750,000
28 United States Brewing Co.	Monadnock Bldg., Chicago, Ill.	September 1, 1890	6	3,500,000	5,000,000		5,000,000
Vehicles for land transportation, total.			1 72	10,300,000	193,000,000	54,500,000	138,500,000
1 American Bicycle Co.	Park Row Bldg., New York City	May 12, 1899	35	10,000,000	30,000,000	10,000,000	20,000,000
2 American Car and Foundry Co.	Lincoln Trust Bldg., St. Louis, Mo.	February 20, 1899	17		60,000,000	30,000,000	30,000,000
3 Pressed Steel Car Co.	Tradesmen's Bldg., Pittsburg, Pa.	January 12, 1899	4		25,000,000	12,500,000	12,500,000
4 Pullman Co., The	309 W. Third St., Chicago, Ill.	December, 1899	6		74,000,000		74,000,000
5 Standard Wheel Co.	Terre Haute, Ind.	August 20, 1892	6	300,000	1,000,000	500,000	500,000
6 Southern Car and Foundry Co.	Birmingham, Ala.	June 1, 1899	5		3,000,000	1,500,000	1,500,000
Tobacco, total.			1 41		205,000,000	79,500,000	125,500,000
1 American Snuff Co.	111 Fifth Ave., New York City	March 12, 1900	9		25,000,000	12,500,000	12,500,000
2 American Tobacco Co.	111 Fifth Ave., New York City	January 21, 1900	15		70,000,000	14,000,000	56,000,000
3 Continental Tobacco Co.	111 Fifth Ave., New York City	November 28, 1898	9		100,000,000	50,000,000	50,000,000
4 Havana-American Co., The	1322 Avenue A., New York City	November 9, 1899	8		10,000,000	3,000,000	7,000,000

¹ The number of plants reported in this table does not agree with the number reported in Tables 1 and 2, because in a number of instances combinations operate plants engaged in different industries. In preparing this list the name of the combination has been placed in the group of industries to which it would be assigned according to its product of chief value. The number also includes 174 plants reported as idle during the census year.

² Acquired by the National Starch Co., April, 1900.

AND DIVIDENDS PAID—Continued.

CAPITALIZATION—continued.				DIVIDENDS PAID DURING CENSUS YEAR.					
Amounts issued.									
Bonds.	Stock.			Rate.		Total.	On preferred stock.	On common stock.	
	Total.	Preferred.	Common.	On preferred.	On common.				
\$9,294,000	\$278,357,295	\$78,151,084	\$200,206,211						
	33,577,900	17,044,900	16,533,000	6 per cent.	None	\$1,024,740	\$1,024,740		1
	30,435,700	10,198,600	20,237,100	6 per cent.	4 per cent.	1,421,400	611,916	\$809,484	2
	33,500,000	16,750,000	16,750,000	7 per cent.	None	1,172,500	1,172,500		3
	3,319,700		3,319,700		10 per cent.	329,470		329,470	4
	5,925,000		5,925,000		6½ per cent.	870,313		870,313	5
	2,924,845	1,864,584	1,560,261	7 per cent.	6 per cent.	189,137	95,521	93,616	6
	3,000,000	2,000,000	1,000,000	None	None				7
	15,427,900	8,260,000	7,167,900	6 per cent.	4 per cent.	660,480	518,078	142,382	8
	3,635,850		3,635,850		7 per cent.	253,860		253,860	9
	12,000,000	5,000,000	7,000,000	7 per cent.	None	265,130	265,130		10
	3,040,000	4,069,200	4,450,700	4 per cent.	None	88,776	88,776		11
	97,246,600	800	97,246,300	6 per cent.	45 per cent.	43,471,242	8,132	43,463,110	12
	950,000	1,466,500	3,380,400	8 per cent.	None	43,995	43,995		13
	24,000,000	12,000,000	12,000,000	8 per cent.	4 per cent.	1,199,525	809,525	390,000	14
	8,555,000	50,315,500	153,190,100						
	75,000,000		75,000,000		8 per cent.	4,500,000		4,500,000	1
	6,000,000		6,000,000		5 per cent.	225,000		225,000	2
	2,271,500		2,271,500		None				3
	64,300,000	27,400,000	27,400,000	7 per cent.	None	1,918,000	1,918,000		4
	4,000,000		4,000,000		4 per cent.	160,000		160,000	5
	600,000		600,000		None				6
	3,900,000	5,107,500	9,944,700	13½ per cent.	None	89,371	89,371		7
	2,000,000	1,000,000	1,000,000	8 per cent.	10 per cent.	180,000	80,000	100,000	8
	23,809,400	14,901,000	14,905,400	7 per cent.	1 per cent.	1,192,334	1,043,280	149,054	9
	10,000,000		10,000,000		6 per cent.	600,000		600,000	10
	1,804,000	1,904,000	2,068,500	None	None				11
	55,529,142	62,503,169	180,797,989						
	2,650,000		2,650,000		None				1
	28,940,000	14,440,000	14,500,000	3½ per cent.	None	505,400	505,400		2
	1,898,560	7,000,000	28,000,000	None	None				3
	3,162,700		3,162,700		6 per cent.	189,762		189,762	4
	2,000,000		2,000,000						5
	3,166,000		5,000,000		½ per cent.	25,000		25,000	6
	4,778,000	2,386,500	2,386,500	6 per cent.	None	143,190	143,190		7
	700,000	350,000	850,000	8 per cent.	None	28,000	28,000		8
	1,642,000	1,900,000	1,900,000	None	None				9
	944,000	426,700	770,000	7 per cent.	None	29,869	29,869		10
	500,000		400,000		None				11
	29,000,000	10,500,000	18,500,000	None	None				12
	7,500,000	2,750,000	2,750,000	6 per cent.	None	165,000	165,000		13
	278,482	1,096,269	595,215	None	None				14
	2,000,000	1,000,000	1,000,000	7 per cent.	None	29,166	29,166		15
	3,000,000		3,000,000		None				16
	5,600,000	2,800,000	2,800,000	None	None				17
	6,819,000	6,100,100	5,962,250	7 per cent.	4 per cent.	655,497	427,007	238,490	18
	4,661,600	5,088,624	6,088,624		\$2.70 per share	137,393	137,393		19
	2,425,000	611,100	412,200	None	None				20
	1,000,000		1,000,000		6 per cent.	60,000		60,000	21
	145,500	242,500	242,500	8 per cent.	6 per cent.	33,950	19,400	14,550	22
	1,160,000	1,150,000	115,000	8 per cent.	None	92,000	92,000		23
	24,000,000	8,000,000	16,000,000	None	None				24
	5,463,000		5,463,000		None				25
	3,500,000	1,750,000	1,750,000	8 per cent.	5 per cent.	227,500	140,000	87,500	26
	3,500,000		5,000,000		70c. per share.	35,000		35,000	27
	10,300,000	52,840,000	136,840,000						28
	10,000,000	10,000,000	20,000,000	None	None				1
	58,180,000	29,090,000	29,090,000	7 per cent.	None	2,036,300	2,036,300		2
	25,000,000	12,500,000	12,500,000	7 per cent.	6 per cent.	1,250,000	875,000	375,000	3
	74,000,000		74,000,000		8 per cent.	5,024,000		5,024,000	4
	300,000	500,000	500,000	6 per cent.	None	30,000	30,000		5
	1,500,000	750,000	750,000	None	None				6
	197,184,628	76,844,600	120,340,028						
	23,001,700	12,000,000	11,001,700	None	None				1
	68,500,000	14,000,000	54,500,000	8 per cent.	6 per cent.	4,390,000	1,120,000	3,270,000	2
	97,690,700	48,844,600	48,844,100	7 per cent.	None	3,419,122	3,419,122		3
	7,992,228	2,000,000	5,992,228	7 per cent.	None	140,000	140,000		4

³ During the year the common stock was increased \$38,550,700, and the preferred stock was decreased \$3,968,400.

⁴ In hands of receivers since April 1, 1900.

⁵ This company declined to furnish the information, stating that their capital was nominal, the real owners being the Indianapolis Brewers, Limited, London, and as the statement, if given, would be misleading, they preferred to make no report.

TABLE 3.—CAPITALIZATION,

NAME OF COMBINATION.	LOCATION OF CENTRAL OFFICE.	DATE OF ORGANIZATION.	Number of plants controlled.	CAPITALIZATION.			
				Amounts authorized by charter.			
				Bonds.	Stock.		
					Total.	Preferred.	Common.
Textiles, total			172	\$39,250,000	\$133,000,000	\$42,000,000	\$91,000,000
1 American Felt Co.....	110-112 E. Thirteenth St., New York City.	February 9, 1899	5	500,000	5,000,000	2,500,000	2,500,000
2 American Grass Twine Co.....	35 Wall St., New York City	June 8, 1899	3		15,000,000		15,000,000
3 American Thread Co.....	260 Broadway, New York City	March 10, 1898	10	6,000,000	12,000,000	6,000,000	6,000,000
4 American Woolen Co.....	Ames Bldg., Boston, Mass.	March 29, 1899	30		65,000,000	25,000,000	40,000,000
5 Mt. Vernon-Woodberry Cotton Duck Co.	Equitable Bldg., Baltimore, Md.	August 29, 1899	7	14,000,000	9,500,000		9,500,000
6 New England Cotton Yarn Co.....	37 N. Water St., New Bedford, Mass.	July 15, 1899	9	6,500,000	11,500,000	6,500,000	5,000,000
7 Standard Rope and Twine Co.....	17 State St., New York City	November 1, 1895	5	10,500,000	12,000,000		12,000,000
8 United States Finishing Co.....	320 Broadway, New York City	July 1, 1899	3	1,750,000	8,000,000	2,000,000	1,000,000
Leather and its finished products, total			1108	20,000,000	199,000,000	81,500,000	117,500,000
1 American Hide and Leather Co.....	92 Cliff St., New York City	August 29, 1899	30	10,000,000	85,000,000	17,500,000	17,500,000
2 Elk Tanning Co.....	Ridgway, Pa.	April 17, 1898	23		12,500,000		12,500,000
3 Penn Tanning Co.....	Sheffield, Pa.	April 13, 1893	14		13,500,000		13,500,000
4 Union Tanning Co.....	Williamsport, Pa.	April 17, 1893	18		10,000,000		10,000,000
5 United States Leather Co.....	26 Ferry St., New York City	February 25, 1893	23	10,000,000	128,000,000	64,000,000	64,000,000
Paper and printing, total			1119	41,250,000	142,000,000	52,500,000	89,500,000
1 American Lithographic Co.....	Fourth Ave. and Nineteenth St., New York City.	January 1, 1898	1	3,000,000	4,000,000		4,000,000
2 American Straw Board Co.....	84 Van Buren St., Chicago, Ill.	May 29, 1889	17	1,250,000	6,000,000		6,000,000
3 American Writing Paper Co.....	Springfield, Mass.	July 25, 1899	25	17,000,000	25,000,000	12,500,000	12,500,000
4 International Paper Co.....	30 Broad St., New York City	January 31, 1893	32	10,000,000	45,000,000	25,000,000	20,000,000
5 National Wall Paper Co.....	121-127 Crosby St., New York City	June, 1892	13	8,000,000	30,000,000		30,000,000
6 Union Bag and Paper Co.....	1602 Fisher Bldg., Chicago, Ill.	February 27, 1899	17		27,000,000	11,000,000	16,000,000
7 United States Envelope Co.....	Springfield, Mass.	June, 1898	9	2,000,000	5,000,000	4,000,000	1,000,000
Clay, glass, and stone products, total			1203	9,200,000	72,490,000	14,200,000	58,290,000
1 American Cement Co.....	22 S. Fifteenth St., Philadelphia, Pa.	March 11, 1890	3		500,000		500,000
2 American Clay Manufacturing Co. ³	Akron, Ohio.	March 1, 1900	23	2,500,000	10,000,000		10,000,000
3 American Window Glass Co.....	200 Ninth St., Pittsburg, Pa.	July 31, 1899	39		17,000,000	4,000,000	13,000,000
4 Baltimore Brick Co.....	1002 Atlantic Trust Bldg., Baltimore, Md.	June 23, 1899	23	1,500,000	2,100,000	600,000	1,500,000
5 Illinois Brick Co.....	Chamber of Com. Bldg., Chicago, Ill.	February 13, 1900	36		9,000,000	4,000,000	5,000,000
6 International Pulp Co.....	41 Park Row Bldg., New York City	March, 1893	1		5,000,000	2,000,000	3,000,000
7 Macbeth-Evans Glass Co.....	Telephone Bldg., Pittsburg, Pa.	July 7, 1899	7		2,200,000	200,000	2,000,000
8 National Fire Proofing Co.....	Carnegie Bldg., Pittsburg, Pa.	December 20, 1899	6		2,000,000	1,000,000	1,000,000
9 National Glass Co.....	Heeren Bldg., Pittsburg, Pa.	November 1, 1899	19	2,000,000	4,000,000		4,000,000
10 Pittsburg Plate Glass Co.....	Carnegie Bldg., Pittsburg, Pa.	April 1, 1895 ⁴	10	2,500,000	10,000,000	150,000	9,850,000
11 Suburban Brick Co.....	Wheeling, W. Va.	December 29, 1898	5	50,000	200,000		200,000
12 Trenton Potteries Co.....	309 N. Clinton Ave., Trenton, N. J.	May 27, 1892	6		3,000,000	1,250,000	1,750,000
13 United States Clay Manufacturing Co. ³	Fifth and Liberty Sts., Pittsburg, Pa.	December 26, 1899	2		240,000		240,000
14 United States Glass Co.....	Ninth and Bingham Sts., Pittsburg, Pa.	February 12, 1891	13		5,000,000	1,000,000	4,000,000
15 Western Stone Co.....	Chamber of Com. Bldg., Chicago, Ill.	September 16, 1899	1	650,000	2,250,000		2,250,000
Lumber and its remanufactures, total			159	1,800,000	43,500,000	11,300,000	32,200,000
1 American School Furniture Co.....	111 Fifth Ave., New York City	March 13, 1899	17	1,500,000	10,000,000	5,000,000	5,000,000
2 Brunswick-Balke-Collender Co.....	860 Broadway, New York City	January 30, 1884	2		1,700,000		1,700,000
3 Diamond Match Co.....	504 Pullman Bldg., Chicago, Ill.	February 13, 1899	9		15,000,000		15,000,000
4 Heywood Bros. & Wakefield Co.....	Gardner, Mass.	March 16, 1897	4		6,000,000	4,000,000	2,000,000
5 National Casket Co.....	Oneida, N. Y.	July 1, 1890	11		6,000,000		6,000,000
6 National Coopers and Woodenware Co.	Peoria, Ill.	October 21, 1899	6		500,000	500,000	
7 United States Bobbin and Shuttle Co.....	270 Butler Exch. Bldg., Providence, R. I.	July 31, 1899	7	300,000	2,000,000	300,000	1,200,000
8 Yellow Pine Co.....	16 Beaver St., New York City	November 12, 1891	3		2,500,000	1,000,000	1,500,000
Miscellaneous industries, total			197	800,000	293,250,000	132,700,000	160,550,000
1 American Glue Co.....	419 Atlantic Ave., Boston, Mass.	July 7, 1894	6		1,800,000	1,000,000	800,000
2 American Hard Rubber Co.....	9-13 Mercer St., New York City	April 21, 1893	3		2,500,000		2,500,000
3 American Ice Co.....	131 E. Twenty-third St., New York City.	March 11, 1899	7		40,000,000	15,000,000	25,000,000
4 American Shipbuilding Co.....	120 Viaduct, Cleveland, Ohio	March 16, 1899	11		30,000,000	15,000,000	15,000,000
5 American Soda Fountain Co.....	278 Congress St., Boston, Mass.	February 4, 1891	7		3,750,000	1st 1,250,000 2d 1,250,000	1,250,000
6 Central Fireworks Co.....	15 Exchange Pl., Jersey City, N. J.	June 8, 1896	6		3,500,000	1,750,000	1,750,000
7 Commonwealth Roofing Co.....	100 William St., New York City	June 6, 1899	6		500,000	250,000	250,000
8 Consolidated Ice Co. ⁵	Thirteenth and Pine Sts., Pittsburg, Pa.	April 1, 1899	7		4,000,000	2,000,000	2,000,000
9 Consolidated Railway Electric Lighting and Equipment Co.	100 Broadway, New York City	January 6, 1900	3		16,000,000		16,000,000
10 Electric Boat Co.....	100 Broadway, New York City	February 7, 1899	3		10,000,000	5,000,000	5,000,000
11 General Aristo Co.....	343 State St., Rochester, N. Y.	August 4, 1899	5		5,000,000	2,500,000	2,500,000
12 National Carbon Co.....	Lock Drawer L, Cleveland, Ohio	January 16, 1899	5		10,000,000	4,500,000	5,500,000
13 Pittsburg Coal Co.....	Pittsburg, Pa.	September 1, 1899	5		64,000,000	32,000,000	32,000,000
14 Rubber Goods Manufacturing Co.....	New Brunswick, N. J.	March 26, 1899	14		50,000,000	25,000,000	25,000,000
15 United States Rubber Co.....	9 Murray St., New York City	March 30, 1892	5		50,000,000	25,000,000	25,000,000
16 United States Whip Co.....	Westfield, Mass.	December 29, 1892	4	800,000	2,200,000	1,200,000	1,000,000

¹ The number of plants reported in this table does not agree with the number reported in Tables 1 and 2, because in a number of instances combinations operate plants engaged in different industries. In preparing this list the name of the combination has been placed in the group of industries to which it would be assigned according to its product of chief value. The number also includes 174 plants reported as idle during the census year.

² Of this amount, \$3,236,500 is for divisional mortgage bonds, assumed at time of incorporation for prior mortgages.

AND DIVIDENDS PAID—Continued.

CAPITALIZATION—continued.				DIVIDENDS PAID DURING CENSUS YEAR.					
Amounts issued.									
Bonds.	Stock.			Rate.		Total.	On preferred stock.	On common stock.	
	Total.	Preferred.	Common.	On preferred.	On common.				
\$36,914,000	\$109,514,175	\$33,417,775	\$76,096,400						
441,000	3,254,600	1,627,300	1,627,300	6 per cent.	None	\$97,638	\$97,638		1
5,798,000	14,118,000		14,118,000	6 per cent.	None	604,524	244,524	\$360,000	2
	8,490,475	4,890,475	3,600,000	7 per cent.	10 per cent.	1,400,000	1,400,000		3
	49,501,100	20,000,000	29,501,100		None				4
13,000,000	9,500,000		9,500,000	7 per cent.	1½ per cent.	142,500		142,500	5
5,577,000	10,000,000	5,000,000	5,000,000		None	350,000	350,000		6
10,378,000	12,000,000		12,000,000		None				7
1,750,000	2,650,000	1,900,000	750,000	7 per cent.	None	133,000	133,000		8
13,805,000	184,015,200	75,282,300	108,732,900						
8,525,000	24,500,000	13,000,000	11,500,000	None	None				1
	12,319,900		12,319,900		\$1.50 per share	184,799		184,799	2
	18,380,000		18,380,000		None				3
	8,649,800		8,649,800		\$1.50 per share	129,747		129,747	4
5,250,000	123,164,000	62,282,300	62,282,300	6 per cent.	None	3,736,375	3,736,375		5
42,461,217	130,006,500	48,115,500	81,891,000						
2,284,000	3,775,600		3,775,600		None				1
657,000	6,000,000		6,000,000		3 per cent.	180,000		180,000	2
17,000,000	20,949,900	10,958,800	9,991,100	None	None				3
13,102,117	39,849,500	22,406,700	17,442,800	6 per cent.	None	1,344,402	1,344,402		4
7,418,100	27,951,500		27,951,500		None				5
	27,000,000	11,000,000	16,000,000	7 per cent.	None	770,000	770,000		6
2,000,000	4,500,000	3,750,000	750,000	7 per cent.	None	262,500	262,500		7
5,567,500	63,896,858	12,532,550	51,364,308						
	499,550		499,550		2½ per cent.	162,353		162,353	1
1,543,500	7,582,700		7,582,700		None				2
	16,315,808	4,000,000	12,315,808	7 per cent.	None	103,667	103,667		3
1,500,000	2,100,000	600,000	1,500,000	6 per cent.	None	18,000	18,000		4
	7,901,000	3,550,500	4,350,500	None	None				5
	4,502,500	1,502,500	3,000,000	4 per cent.	None	60,100	60,100		6
	1,846,250	200,000	1,646,250	7 per cent.	4 per cent.	78,780	14,000	64,780	7
	1,089,550	589,550	500,000	7 per cent.	None	29,277	29,277		8
2,000,000	2,317,900		2,317,900	None	None				9
10,000	10,000,000	150,000	9,850,000	12 per cent.	6 per cent.	609,000	18,000	591,000	10
	103,500		103,500		6 per cent.	6,210		6,210	11
	8,000,000	1,250,000	1,750,000	None	None				12
	240,000		240,000		None				13
	4,148,100	690,000	3,458,100	None	None				14
496,000	2,250,000		2,250,000	None	None				15
275,000	39,534,400	10,027,800	29,506,600						
	8,856,100	3,977,800	4,878,300	None	None				1
	1,500,000		1,500,000		6 per cent.	90,000		90,000	2
	14,750,000		14,750,000		10 per cent.	1,475,000		1,475,000	3
	0,000,000	4,000,000	2,000,000	8 per cent.	None	320,000	320,000		4
	4,177,300		4,177,300		5 per cent.	208,820		208,820	5
275,000	600,000	500,000	1,000,000	None	None				6
	1,651,000	650,000	1,001,000	7 per cent.	None	34,125	34,125		7
	2,100,000	900,000	1,200,000	None	None				8
332,000	238,367,700	99,394,600	138,973,100						
	1,800,000	1,000,000	800,000	8 per cent.	None	80,000	80,000		1
	2,455,200		2,455,200		7 per cent.	171,814		171,814	2
	35,249,100	12,327,200	22,921,900	6 per cent.	4 per cent.	1,246,001	553,120	692,881	3
	15,500,000	7,900,000	7,600,000	7 per cent.	None	553,000	553,000		4
	3,750,000	1st 1,250,000 2d 1,250,000	1,250,000	3 per cent on 1st preferred.	None	37,500	37,500		5
	2,673,000	1,267,200	1,405,800	3½ per cent.	None	44,352	44,352		6
	430,000	215,000	215,000	3½ per cent.	None	7,525	7,525		7
	4,000,000	2,000,000	2,000,000	6 per cent.	4 per cent.	200,000	120,000	80,000	8
	16,000,000		16,000,000		None				9
	6,744,600	1,745,000	4,999,600	None	None				10
	4,800,000	2,400,000	2,400,000	7 per cent.	10 per cent.	369,000	152,000	217,000	11
	10,000,000	4,500,000	5,500,000	7 per cent.	None	315,000	815,000		12
	64,000,000	32,000,000	32,000,000	7 per cent.	None	1,680,000	1,680,000		13
	22,765,200	7,624,400	15,140,800	7 per cent.	None	607,624	607,624		14
	47,191,500	23,525,500	23,666,000	8 per cent.	3 per cent.	2,592,020	1,882,040	709,980	15
332,000	1,009,100	330,300	618,800	12 per cent.	None	46,876	46,876		16

¹ Acquired by the American Sewer Pipe Company.
² Latest reorganization.
³ Merged with the American Ice Co.

Twelfth Census of the United States.

CENSUS BULLETIN.



No. 123.

WASHINGTON, D. C.

January 3, 1902.

MANUFACTURES.

GAS.

HON. WILLIAM R. MERRIAM,
Director of the Census.

SIR: I transmit herewith, for publication in bulletin form, a report on the manufacture of gas for the census year 1900, prepared under my direction by Mr. Arthur L. Hunt, of Maine.

Through the courtesy of Hon. Carroll D. Wright, Commissioner of Labor, the returns secured under his supervision for the report on "Water, gas, and electric light plants under private and municipal ownership," for 1899, were used by the Census Office as a basis for this investigation.

It has been nearly a century since gas was first employed in this country as an illuminant. The growth of the industry during the first half of the century was slow, and as late as 1835, there were not more than a half dozen gas plants in operation. At the census of 1850, reports were received from only 30 establishments, but the number increased nearly 650 per cent between 1850 and 1860. The growth and development of the industry for the latter half of the century is indicated in the accompanying report.

At the census of 1890, for the first time, the manufacture of gas was made the subject of a special report. No historical data were presented, the report being purely statistical. In addition to the statistics collected at the present census, the accompanying bulletin gives a concise history of the industry during the past century. It is interesting to note that since 1890 there has been a development in one branch of the gas industry which may displace, to some extent, other methods of manufacturing gas for fuel and lighting purposes. This is the coke-oven process, in which gas is a by-product. A coke establishment in New England, making gas by this process, seems to have been successful. The report warrants the conclusion that, although the wider uses to which gas has been adapted have caused a striking increase of 86.9 per cent during the decade in the number of feet consumed, the rapidly increasing use of electricity for lighting purposes has not only tended to prevent the erection of new gas

plants, but has resulted in the dismantling of nearly 50 establishments during the decade.

The modern tendency toward concentration of industrial enterprises is well exemplified in the gas industry, in which there is an increase, as compared with 1890, of but 18.2 per cent in the number of establishments reporting, while the increase in the capital is 119.1 per cent; the average capital per establishment for 1900 is \$646,523, as compared with \$348,749 for 1890, the average capital in 1900 being nearly double that in 1890. The increase in the number of cubic feet of gas consumed is 83.7 per cent. The average product per establishment has risen from 49,217,870 cubic feet in 1890 to 76,503,482 cubic feet in 1900, an average increase of 55.4 per cent per establishment. The reduction in price from \$1.42 to \$1.035 per thousand cubic feet, the average price obtained throughout the United States, has caused the value of products to show a lower rate of increase, the \$56,987,290 reported in 1890 increasing 32.9 per cent to \$75,716,693 produced in 1900.

The statistics are presented in 10 tables: Table 1 showing comparative figures for the industry at the several censuses; Table 2 showing the localities from which returns were received and the number of establishments in each; Table 3 showing, by states and territories, the number of establishments in operation in 1890 and 1900, the increase, and the number of plants constructed during the decade; Table 4 showing a comparative summary of the statistics of capital for 1890 and 1900; Table 5 showing statistics relative to bonds and stocks in 1900; Table 6 showing comparative statistics of miscellaneous expenses for 1890 and 1900; Table 7 showing a comparison of the cost of different materials for 1890 and 1900; Table 8 showing, by states and territories, the quantity, value, and average value per 1,000 cubic feet of gas for 1900; Table 9 showing the detailed statistics for the industry in 1900, by states and territories; and Table 10 showing detailed statistics for municipal plants.

Table 1 shows the growth of the industry for the half century which terminates with the Twelfth Census. The manufacturing statistics of the censuses prior to 1850 were too imperfect and fragmentary in character to make it proper to reproduce them in such a table as a measure of industrial growth in the first half of the century. Owing to changes in the method of taking the census, comparisons between the earlier and later decades, represented in Table 1, should be drawn only in the most general way. Nevertheless, the rate of growth in the manufacture of gas may be fairly inferred from the figures given.

In drafting the schedules of inquiry for the census of 1900 care was taken to preserve the basis of comparison with prior censuses. Comparison may be made safely with respect to all the items of inquiry except those relating to capital, salaried officials, clerks, etc., and their salaries, the average number of employees, and the total amount of wages paid. Live capital, that is, cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries, was first called for at the census of 1890. No definite attempt was made, prior to the census of 1890, to secure a return of live capital invested.

Changes were made in the inquiries relating to employees and wages in order to eliminate defects found to exist on the form of inquiry adopted in 1890. At the census of 1890 the average number of persons employed during the entire year was called for, and also the average number employed at stated weekly rates of pay, and the average number was computed for the actual time the establishments were reported as being in operation. At the census of 1900 the greatest and least numbers of employees were reported, and also the average number employed during each month of the year. The average number of wage-earners (men, women, and children) employed during the entire year was ascertained by using 12, the number of calendar months, as a divisor into the total of the average numbers reported for each month. This difference in the method of ascertaining the average number of wage-earners during the entire year may have resulted in a variation in the number, and should be considered in making comparisons.

At the census of 1890 the number and salaries of proprietors and firm members actively engaged in the business or in supervision were reported, combined with clerks and other officials. In cases where proprietors and firm mem-

bers were reported without salaries, the amount that would ordinarily be paid for similar services was estimated. At the census of 1900 only the number of proprietors and firm members actively engaged in the industry or in supervision was ascertained, and no salaries were reported for this class. It is therefore impossible to compare the number and salaries of salaried officials of any character for the two censuses.

Furthermore, the schedules for 1890 included in the wage-earning class, overseers, foremen, and superintendents (not general superintendents or managers), while the census of 1900 separates from the wage-earning class such salaried employees as general superintendents, clerks, and salesmen. It is possible and probable that this change in the form of the question has resulted in eliminating from the wage-earners, as reported by the present census, many high-salaried employees included in that group for the census of 1890.

The reports show a capital of \$587,000,506 invested in the manufacture of gas in the 877 establishments reporting for the United States. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations engaged in this industry. The value of the products is returned at \$75,716,693, to produce which involved an outlay of \$5,273,500 for salaries of officials, clerks, etc.; \$12,436,296 for wages; \$14,769,022 for miscellaneous expenses, including rent, taxes, etc.; and \$20,605,356 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of gas during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

Very respectfully,



Chief Statistician for Manufactures.

GAS MANUFACTURE.

By ARTHUR L. HUNT.

The statistics presented in the following tables embrace the operations of establishments engaged in the manufacture of gas, for sale, including the plants owned and operated by municipalities. They do not include reports from private plants which sell no gas. Table 1 presents the principal features of the statistics for the industry as returned at the censuses of 1850 to 1900, inclusive, with the percentages of increase for each decade.

TABLE 1.—COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870	1850 to 1860
Number of establishments	877	742		390	221	80	18.2			76.5	686.7
Capital	\$567,000,506	\$258,771,785		\$71,778,694	\$28,848,720	\$6,674,000	119.1			148.8	332.8
Salaries	5,901	\$1,864		(4)	(4)	(4)	216.7				
Salaried officials, clerks, etc., number	\$5,273,500	\$2,148,169		(4)	(4)	(4)	146.1				
Wage-earners, average number	22,459	12,996		8,723	5,780	952	72.8			52.2	501.9
Total wages	\$12,436,296	\$8,499,625		\$6,546,734	\$2,321,536	\$390,684	46.8			182.0	494.2
Men, 16 years and over	22,446	12,952		8,705	5,780	950	73.8			51.9	503.2
Wages	\$12,431,234	\$8,492,797		(4)	\$2,321,536	(4)	46.4				
Women, 16 years and over	10					2					6100.0
Wages	\$4,256					(4)					
Children, under 16 years	3	44		18			683.2				
Wages	\$306	\$6,828		(4)			688.2				
Miscellaneous expenses	\$14,769,022	\$7,790,385		(2)	(2)	(2)	89.4				
Cost of materials used	\$20,605,356	\$14,087,087		\$10,869,878	\$3,667,630	\$503,074	46.8			195.4	629.0
Value of products	\$75,716,693	\$58,987,290		\$32,048,351	\$12,016,353	\$1,921,746	32.9			166.7	525.3

- ¹ Includes 15 establishments operated by municipalities, which are shown separately in Table 10.
² Not reported.
³ Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 9.)
⁴ Not reported separately.
⁵ Decrease.

Table 1 shows the remarkable growth which has occurred in the industry during the past half century. The first census at which the statistics of the manufacture of gas were returned, with sufficient accuracy and detail to justify a comparison, was that of 1850. In that year 80 establishments were reported, as compared with 877 in 1900, an increase of 847, or nearly thirtyfold. During the same period, the capital increased from \$6,674,000 to \$567,000,506, or over eightyfold; the number of wage-earners from 952 to 22,459, or twentyfold; the total wages from \$390,684 to \$12,436,296, or thirtyfold; the cost of materials from \$503,074 to \$20,605,356, or nearly fortyfold; and the value of products from \$1,921,746 to \$75,716,693, or nearly fortyfold. The industry was not reported at the Tenth Census, and consequently no figures are available for the production of gas in 1880. During the decade from 1890 to 1900 the number of establishments increased from 742 to 877, or 18.2 per cent. This increase is more apparent than real, as the full number of establishments was not reported in 1890.¹ The indications are that the number of establishments engaged in the industry is not increasing to any considerable extent. This is made clearer when it is stated that while there were 66 new establishments constructed during the past decade, 92 establishments from which reports were received in 1890 failed to make returns in 1900. Of this latter number 47, or over one-half, were not in operation, having been dismantled, closed indefinitely, or changed to electric

plants. Of the 45 establishments remaining, nearly one third now distribute natural gas; a few failed to make returns for census purposes; and 18 establishments that were reported separately in 1890 have since lost their identity through consolidation. The number of new establishments seems small when it is considered that of the 1,653 cities and towns in the United States having a population of 2,500 and over, there were 826 in which no gas was manufactured. Of the 1,244 cities and towns with a population of 2,500 and over in 1890, there were only 530 not enjoying gas privileges. Of the 877 establishments shown for the Twelfth Census, 269, or 30.7 per cent, were operated in connection with the generation of electricity, and it was reported in many cases that the production of gas was attended with an actual loss.

The striking increase in capital, 119.1 per cent, is found chiefly in the items of machinery, tools, implements, and equipment. It is due to the constant demand for new equipment required to provide for increasing service. This also explains, in part, the fact that the percentage of increase in the value of products, 32.9 per cent, is so much smaller than the per cent of increase in capital; another factor being the reduction in the price of gas during the past decade, which would reduce the percentage of increase in the value of products. Between 1890 and 1900 the quantity of gas sold by gas companies increased 83.7 per cent, which may be a more accurate indication of the increase in the production than that represented by 32.9 per cent, the increase in value. This is further illustrated by comparing the average capital and product per establishment in 1890 with those items in 1900. In 1890 the

¹ Report on Manufacturing Industries in the United States at the Eleventh Census, 1890, Part III, Selected Industries, page 699.

average capital per establishment was \$348,749, and in 1900, \$648,523, or an increase in the average capital per establishment of 86 per cent. The average value of products per establishment in 1890 was \$76,802, while in 1900 it was \$86,336, an increase in value of products per establishment of only 12.4 per cent.

Table 2 is a list of the localities, alphabetically arranged,

from which returns were received for the manufacture of gas in 1900, together with the number of establishments reporting from each. Where two or more plants controlled by the same corporation, firm, or individual are located in the same city or town, they have been counted as one establishment.

TABLE 2.—NUMBER OF ESTABLISHMENTS IN EACH LOCALITY: 1900.

Aberdeen, S. Dak	1	Beloit, Wis	1	Chester, Pa	1	Delaware, Ohio	1
Adams, Mass	1	Belvidere, Ill	1	Cheyenne, Wyo	1	Delphos, Ohio	1
Adrian, Mich	1	Benton Harbor, Mich	1	Chicago, Ill	4	Denison, Tex	1
Akron, Ohio	1	Bethlehem, Pa	1	Chico, Cal	1	Denver, Colo	1
Albany, N. Y	1	Beverly, Mass	1	Chicopee, Mass	1	Derby, Conn	1
Albion, Mich	1	Biddeford, Me	1	Chillicothe, Mo	1	Des Moines, Iowa	1
Albion, N. Y	1	Big Rapids, Mich	1	Chillicothe, Ohio	1	Detroit, Mich	1
Albuquerque, N. Mex	1	Binghamton, N. Y	1	Chippewa Falls, Wis	1	Dixon, Ill	1
Alexandria, Va	1	Birmingham, Ala	1	Cincinnati, Ohio	1	Dover, Del	1
Allentown, Pa	1	Bloomington, Ill	1	Circleville, Ohio	1	Dover, N. H	1
Alliance, Ohio	1	Bloomington, Ind	1	Claremont, N. H	1	Downington, Pa	1
Alpena, Mich	1	Bloomsville, Pa	1	Clarksburg, W. Va	1	Dubuque, Iowa	1
Alton, Ill	1	Boonville, Mo	1	Clarksville, Tenn	1	Duluth, Minn	1
Altoona, Pa	1	Bordentown, N. J	1	Clearfield, Pa	1	Dunkirk, N. Y	1
Americus, Ga	1	Boston, Mass	6	Cleveland, Ohio	1	Duquoin, Ill	1
Amesbury, Mass	1	Bowling Green, Ky	1	Clifton Springs, N. Y	1	Easthampton, Mass	1
Amherst, Mass	1	Braddock, Pa	1	Clinton, Iowa	1	Easton, Md	1
Amsterdam, N. Y	1	Brattleboro, Vt	1	Clinton, Mass	1	Easton, Pa	1
Annapolis, Md	1	Bridgeport, Conn	2	Clinton, Mo	1	East St. Louis, Ill	1
Ann Arbor, Mich	1	Bridgeton, N. J	1	Clyde, N. Y	1	Eau Claire, Wis	1
Anniston, Ala	1	Bristol, Pa	1	Clyde, Ohio	1	Eldorado, Kans	1
Appleton, Wis	1	Bristol, R. I	1	Coatesville, Pa	1	Elgin, Ill	1
Ardmore, Pa	1	Bristol, Tenn	1	Cohoes, N. Y	1	Elizabeth, N. J	1
Arkansas City, Kans	1	Brockport, N. Y	1	Coldwater, Mich	1	Elkhart, Ind	1
Arlington, Mass	1	Brockton, Mass	1	Colorado Springs, Colo	1	Elkton, Md	1
Asheville, N. C	1	Brownsville, Pa	1	Columbia, Mo	1	Elmira, N. Y	1
Ashland, Ohio	1	Brunswick, Ga	1	Columbia, Pa	1	El Paso, Tex	1
Ashland, Pa	1	Bucyrus, Ohio	1	Columbia, S. C	1	Elyria, Ohio	1
Ashland, Wis	1	Buffalo, N. Y	1	Columbia, Tenn	1	Emporia, Kans	1
Ashtabula, Ohio	1	Burlington, Iowa	1	Columbus, Ga	1	Eric, Pa	1
Astoria, Oreg	1	Burlington, N. J	1	Columbus, Ind	1	Escanaba, Mich	1
Atchison, Kans	1	Burlington, Vt	1	Columbus, Miss	1	Eufrata, Ala	1
Athens, Ga	1	Butte, Mont	1	Columbus, Ohio	1	Eureka, Cal	1
Athol, Mass	1	Cadiz, Ohio	1	Colusa, Cal	1	Evanston, Ill	1
Atlanta, Ga	2	Cairo, Ill	1	Concord, N. H	1	Evansville, Ind	1
Atlantic, Iowa	1	Calais, Me	1	Connellsville, Pa	1	Excelsior Springs, Mo	1
Atlantic City, N. J	1	Cambridge, Md	1	Connersville, Ind	1	Exeter, N. H	1
Attleboro, Mass	1	Cambridge, Mass	1	Conshohocken, Pa	1	Fairfield, Iowa	1
Auburn, N. Y	1	Camden, N. J	2	Cooperstown, N. Y	1	Fairhaven, Wash	1
Augusta, Ga	1	Camandaigua, N. Y	1	Corning, N. Y	1	Fall River, Mass	1
Augusta, Me	1	Canton, Ill	1	Cortland, N. Y	1	Fargo, N. Dak	1
Aurora, Ill	1	Canton, Ohio	1	Coshocton, Ohio	1	Faribault, Minn	1
Aurora, Ind	1	Cape May, N. J	1	Cottage City, Mass	1	Farmington, N. H	1
Baker City, Oreg	1	Carbondale, Pa	1	Council Bluffs, Iowa	1	Fayetteville, N. C	1
Bakersfield, Cal	1	Carlinville, Ill	1	Covington, Ky	1	Fishkill Landing, N. Y	1
Ballston Spa, N. Y	1	Carlisle, Pa	1	Crawfordsville, Ind	1	Fitchburg, Mass	1
Baltimore, Md	2	Carson City, Nev	1	Creston, Iowa	1	Flemington, N. J	1
Bangor, Me	1	Cartersville, Ga	1	Cumberland, Md	1	Flint, Mich	1
Baraboo, Wis	1	Carthage, Mo	1	Dallas, Tex	1	Florence, Ala	1
Barnesville, Ohio	1	Catasauqua, Pa	1	Danbury, Conn	1	Fond du Lac, Wis	1
Batavia, N. Y	1	Catskill, N. Y	1	Danielson, Conn	1	Fort Dodge, Iowa	1
Bath, Me	1	Cedar Rapids, Iowa	1	Dansville, N. Y	1	Fort Madison, Iowa	1
Bath, N. Y	1	Centerville, Iowa	1	Danvers, Mass	1	Fort Plain, N. Y	1
Baton Rouge, La	1	Centralia, Ill	1	Danville, Ill	1	Fort Scott, Kans	1
Battle Creek, Mich	1	Chambersburg, Pa	1	Danville, Ky	1	Fort Smith, Ark	1
Bay City, Mich	2	Champaign, Ill	1	Danville, Pa	1	Fort Wayne, Ind	1
Bayshore, N. Y	1	Charleston, S. C	1	Darby, Pa	2	Fort Worth, Tex	1
Beatrice, Nebr	1	Charleston, W. Va	1	Davenport, Iowa	1	Fostoria, Ohio	1
Beaver Falls, Pa	1	Charles Town, W. Va	1	Dayton, Ohio	1	Framingham, Mass	1
Belfast, Me	1	Charlotte, Mich	1	Decatur, Ala	1	Frankfort, Ind	1
Bellaire, Ohio	1	Charlotte, N. C	1	Decatur, Ill	1	Frankfort, Ky	1
Bellefontaine, Ohio	1	Charlottesville, Va	1	Dedham, Mass	1	Franklin, Ind	1
Bellefonte, Pa	1	Chattanooga, Tenn	2	Defiance, Ohio	1	Franklin, N. H	1
Bellevue, Ky	1	Chelsea, Mass	1			Frederick, Md	1

TABLE 2.—NUMBER OF ESTABLISHMENTS IN EACH LOCALITY: 1900—Continued.

Fredericksburg, Va	1	Huntsville, Mo	1	London, Ohio	1	Mt. Joy, Pa	1
Freehold, N. J	1	Hutchinson, Kans	1	Long Branch, N. J	1	Mt. Pleasant, Iowa	1
Freeport, Ill	1	Independence, Iowa	1	Lorain, Ohio	1	Mt. Sterling, Ky	1
Fremont, Nebr	1	Independence, Mo	1	Los Angeles, Cal	1	Mt. Vernon, N. Y	1
Fremont, Ohio	1	Indianapolis, Ind	2	Los Gatos, Cal	1	Mt. Vernon, Ohio	1
Fresno, Cal	1	Ionia, Mich	1	Louisiana, Mo	1	Murfreesboro, Tenn	1
Frostburg, Md	1	Iowa City, Iowa	1	Louisville, Ky	1	Murphysboro, Ill	1
Gainesville, Fla	1	Ipswich, Mass	1	Lowell, Mass	1	Muscatine, Iowa	1
Gainesville, Tex	1	Ironton, Ohio	1	Lynchburg, Va	1	Muskegon, Mich	1
Galena, Ill	1	Ishpeming, Mich	1	Lynn, Mass	1	Nanticoke, Pa	1
Galesburg, Ill	1	Ithaca, N. Y	1	Lyons, N. Y	1	Nantucket, Mass	1
Gallion, Ohio	1	Jackson, Cal	1	McKeesport, Pa	1	Napa, Cal	1
Gallipolis, Ohio	1	Jackson, Miss	1	Macomb, Ill	1	Nashua, N. H	1
Galva, Ill	1	Jackson, Tenn	1	Macon, Ga	1	Nashville, Tenn	1
Galveston, Tex	1	Jacksonville, Fla	2	Macon, Mo	1	Natchez, Miss	1
Garden City, N. Y	1	Jacksonville, Ill	1	Madison, Ind	1	Natick, Mass	1
Gardner, Mass	1	Jamestown, N. Y	1	Madison, Wis	1	Nebraska City, Nebr	1
Geneseo, N. Y	1	Janesville, Wis	1	Mahanoy City, Pa	1	Neenah, Wis	1
Geneva, N. Y	1	Jefferson City, Mo	1	Malden, Mass	1	Negaunee, Mich	1
Georgetown, Ky	1	Jeffersonville, Ind	1	Malone, N. Y	1	Nevada, Mo	1
Gettysburg, Pa	1	Jersey Shore, Pa	1	Manchester, N. H	1	Nevada City, Cal	1
Gilroy, Cal	1	Johnstown, N. Y	1	Manistee, Mich	1	New Albany, Ind	1
Girardville, Pa	1	Johnstown, Pa	1	Mankato, Minn	1	Newark, N. J	1
Glen Falls, N. Y	1	Joliet, Ill	1	Mansfield, Ohio	1	Newark, Ohio	1
Glooucester, Mass	1	Kalamazoo, Mich	2	Marblehead, Mass	1	New Bedford, Mass	1
Glooucester City, N. J	1	Kankakee, Ill	1	Marietta, Ohio	1	Newbern, N. C	1
Goshen, Ind	1	Kansas City, Kans	1	Marionette, Wis	1	New Britain, Conn	1
Goshen, N. Y	1	Kansas City, Mo	1	Marion, Ohio	1	New Brunswick, N. J	1
Grafton, W. Va	1	Kearney, Nebr	1	Marlboro, Mass	1	Newburg, N. Y	1
Grand Forks, N. Dak	1	Keene, N. H	1	Marquette, Mich	1	Newburyport, Mass	1
Grand Haven, Mich	1	Kenosha, Wis	1	Marshall, Mich	1	Newcastle, Del	1
Grand Island, Nebr	1	Kenton, Ohio	1	Marshall, Mo	1	Newcastle, Pa	1
Grand Rapids, Mich	1	Keokuk, Iowa	1	Marshalltown, Iowa	1	New Hartford, Conn	1
Grass Valley, Cal	1	Kewanée, Ill	1	Martinsburg, W. Va	1	New Haven, Conn	1
Green Bay, Wis	1	Kingston, N. Y	1	Martinsville, Ind	1	New London, Conn	1
Greencastle, Ind	1	Knoxville, Tenn	1	Marysville, Cal	1	New Orleans, La	1
Greenfield, Mass	1	Kokomo, Ind	1	Massillon, Ohio	1	New Philadelphia, Ohio	1
Greensboro, N. C	1	Laconia, N. H	1	Matawan, N. J	1	Newport, R. I	1
Greensburg, Pa	1	La Crosse, Wis	1	Mattoon, Ill	1	Newport News, Va	1
Greenville, Mich	1	Lafayette, Ind	1	Mauch Chunk, Pa	1	Newton, Kans	1
Greenville, Ohio	1	Lambertville, N. J	1	Maysville, Ky	1	Newton, Mass	1
Greenville, Pa	1	Lancaster, Ohio	1	Meadville, Pa	1	Newton, N. J	1
Greenville, S. C	1	Lancaster, Pa	1	Mechanicsburg, Ohio	1	New York, N. Y	13
Hackensack, N. J	1	Lausling, Mich	1	Mechanicsburg, Pa	1	Brooklyn borough	1
Hagerstown, Md	1	Laporte, Ind	1	Media, Pa	1	College Point	1
Hamilton, Ohio	2	Lasalle, Ill	1	Medina, N. Y	1	Coney Island	1
Hamlet, N. C	1	Latrobe, Pa	1	Memphis, Tenn	2	Flushing	2
Hannibal, Mo	1	Lawrence, Kans	1	Mendota, Ill	2	Manhattan borough	6
Hanover, Pa	1	Lawrence, Mass	1	Menominee, Mich	1	Rockaway Beach	1
Harrisburg, Pa	1	Lawrenceburg, Ind	1	Merchantville, N. J	1	Stapleton	1
Hartford, Conn	1	Leadville, Colo	1	Meriden, Conn	1	Niagara Falls, N. Y	1
Hastings, Nebr	1	Leavenworth, Kans	1	Meridian, Miss	1	Niles, Mich	1
Haverhill, Mass	1	Lebanon, Ind	1	Michigan City, Ind	1	Norfolk, Va	1
Haverstraw, N. Y	1	Lebanon, Ohio	1	Middleboro, Mass	1	Norristown, Pa	1
Hazelton, Pa	1	Lebanon, Pa	1	Middletown, Conn	1	North Adams, Mass	1
Helena, Ark	1	Le Mars, Iowa	1	Middletown, N. Y	1	Northampton, Mass	1
Helena, Mont	1	Leominster, Mass	1	Middletown, Ohio	1	North Attleboro, Mass	1
Hempstead, N. Y	1	Leroy, N. Y	1	Millford, Mass	1	Norwalk, Conn	1
Henderson, Ky	1	Lewisburg, Pa	1	Millville, N. J	1	Norwich, Conn	1
Hillsboro, Ohio	1	Lewiston, Me	1	Milton, Pa	1	Norwich, N. Y	2
Hillsdale, Mich	1	Lewistown, Pa	1	Milwaukee, Wis	1	Norwood, Mass	1
Hoboken, N. J	1	Lexington, Ky	1	Minneapolis, Minn	2	Nyaack, N. Y	1
Hollister, Cal	1	Lexington, Mass	1	Moberly, Mo	1	Oakland, Cal	1
Holyoke, Mass	1	Lexington, Mo	1	Mobile, Ala	2	Oakpark, Ill	1
Honesdale, Pa	1	Liberty, Ind	1	Modesto, Cal	1	Oberlin, Ohio	1
Hoosick Falls, N. Y	1	Lima, Ohio	1	Moline, Ill	1	Ocala, Fla	1
Hopkinsville, Ky	1	Lincoln, Ill	1	Monmouth, Ill	1	Ogden, Utah	1
Hot Springs, Ark	1	Lincoln, Nebr	1	Monongahela, Pa	1	Ogdensburg, N. Y	1
Houston, Tex	1	Lisbon, Ohio	1	Monroe, Mich	1	Omaha, Nebr	1
Hudson, N. Y	1	Litchfield, Ill	1	Montgomery, Ala	1	Oneida, N. Y	1
Huntingdon, Pa	1	Little Falls, N. Y	1	Montpelier, Vt	1	Oneonta, N. Y	1
Huntington, Ind	1	Little Rock, Ark	1	Morris, Ill	1	Orlando, Fla	1
Huntington, N. Y	1	Lock Haven, Pa	1	Morristown, N. J	1	Oroville, Cal	1
Huntington, W. Va	1	Lockport, N. Y	1	Mt. Clemens, Mich	1	Oshkosh, Wis	1
Huntsville, Ala	1	Logansport, Ind	1	Mt. Holly, N. J	1	Oskaloosa, Iowa	1

TABLE 2.—NUMBER OF ESTABLISHMENTS IN EACH LOCALITY: 1900—Continued.

Ossining, N. Y.	1	Red Bluff, Cal.	1	Sharpsburg, Pa.	1	Vineland, N. J.	1
Oswego, N. Y.	1	Red Oak, Iowa	1	Sheboygan, Wis.	1	Virginia City, Nev.	1
Ottawa, Ill.	1	Red Wing, Minn.	1	Shelbyville, Ind.	1	Wabash, Ind.	1
Ottawa, Kans.	1	Reno, Nev.	1	Shelbyville, Ky.	1	Waco, Tex.	1
Ottumwa, Iowa	1	Rensselaer, N. Y. (formerly Green- bush).	1	Shenandoah, Pa.	1	Wakefield, Mass.	1
Owego, N. Y.	1	Rhinebeck, N. Y.	1	Sherman, Tex.	1	Wallawalla, Wash.	1
Owensboro, Ky.	1	Rieh Hill, Mo.	1	Shippensburg, Pa.	1	Wallingford, Conn.	1
Owosso, Mich.	1	Richmond, Ind.	1	Shreveport, La.	1	Waltham, Mass.	1
Paducah, Ky.	1	Richmond, Ky.	1	Sidney, Ohio.	1	Wappingers Falls, N. Y.	1
Painesville, Ohio.	1	Richmond, Va.	1	Sioux City, Iowa.	1	Ware, Mass.	1
Palatka, Fla.	1	Richmond, Va.	1	Sioux Falls, S. Dak.	1	Warren, Ohio.	1
Palmyra, N. Y.	1	Ripley, Ohio.	1	Smyrna, Del.	1	Warsaw, Ind.	1
Paris, Ill.	1	Ripon, Wis.	1	Somersworth, N. H.	1	Warsaw, N. Y.	1
Paris, Ky.	1	Riverside, Cal.	1	Somerville, N. J.	1	Washington, D. C.	3
Paris, Tex.	1	Roanoke, Va.	1	South Bend, Ind.	1	Washington, Ind.	1
Parkersburg, W. Va.	1	Rochester, Minn.	1	Southbridge, Mass.	1	Washington, Iowa.	1
Pasadena, Cal.	1	Rochester, N. Y.	1	Spartanburg, S. C.	1	Washington, N. C.	1
Passaic, N. J.	1	Rockford, Ill.	1	Spencer, Mass.	1	Washington, Pa.	1
Pawtucket, R. I.	1	Rockland, Me.	1	Spokane, Wash.	1	Washington Court House, Ohio.	1
Peekskill, N. Y.	1	Rome, Ga.	1	Springfield, Ill.	1	Waterbury, Conn.	1
Pekin, Ill.	1	Rome, N. Y.	1	Springfield, Mass.	1	Waterloo, Iowa.	1
Penn Yan, N. Y.	1	Rushville, Ind.	1	Springfield, Mo.	1	Watertown, N. Y.	1
Pensacola, Fla.	1	Rutland, Vt.	1	Springfield, Ohio.	1	Watertown, Wis.	1
Peoria, Ill.	2	Sacramento, Cal.	1	Stamford, Conn.	1	Waterville, N. Y.	1
Perth Amboy, N. J.	1	Sag Harbor, N. Y.	1	Staunton, Va.	1	Watkins, N. Y.	1
Peru, Ind.	1	Saginaw, Mich.	2	Sterling, Ill.	1	Watsonville, Cal.	1
Petaluma, Cal.	1	St. Albans, Vt.	1	Steubenville, Ohio.	1	Waukegan, Ill.	1
Petersburg, Va.	1	St. Augustine, Fla.	1	Stevens Point, Wis.	1	Waukesha, Wis.	1
Philadelphia, Pa.	9	St. Charles, Mo.	1	Stillwater, Minn.	1	Wausau, Wis.	1
Phillipsburg, N. J.	2	St. Cloud, Minn.	1	Stockton, Cal.	1	Waverly, N. Y.	1
Phoenix, Ariz.	1	St. Helena, Cal.	1	Stoneham, Mass.	1	Waynesboro, Pa.	1
Phoenixville, Pa.	1	St. Johns, Mich.	1	Stoughton, Mass.	1	Webster, Mass.	1
Pine Bluff, Ark.	1	St. Joseph, Mo.	1	Streator, Ill.	1	Wellington, Kans.	1
Piqua, Ohio.	1	St. Louis, Mo.	2	Stroudsburg, Pa.	1	Wellsville, Ohio.	1
Pittsburg, Kans.	1	St. Paul, Minn.	1	Sunbury, Pa.	1	West Chester, Pa.	1
Pittsburg, Pa.	3	Salem, Mass.	1	Superior, Wis.	1	Westerly, R. I.	1
Pittsfield, Mass.	1	Salem, N. J.	1	Syracuse, N. Y.	1	Westfield, Mass.	1
Pittsfield, N. H.	1	Salem, Ohio.	1	Tacoma, Wash.	1	Westfield, N. Y.	1
Pittston, Pa.	1	Salem, Oreg.	1	Tallahadega, Ala.	1	Westminster, Md.	1
Plainfield, N. J.	1	Salina, Kans.	1	Tallahassee, Fla.	1	West Winfield, N. Y.	1
Plattsburg, N. Y.	1	Salinas, Cal.	1	Tamaqua, Pa.	1	West Winsted, Conn.	1
Plattsmouth, Nebr.	1	Salisbury, N. C.	1	Tampa, Fla.	1	Wheeling, W. Va.	1
Plymouth, Mass.	1	Salt Lake City, Utah.	1	Tarrytown, N. Y.	1	White Plains, N. Y.	1
Plymouth, Pa.	1	San Antonio, Tex.	1	Taunton, Mass.	1	Wichita, Kans.	1
Pomona, Cal.	1	San Bernardino, Cal.	1	Taylorville, Ill.	1	Wilkesbarre, Pa.	1
Pontiac, Mich.	1	San Diego, Cal.	1	Terre Haute, Ind.	1	Williamsport, Pa.	1
Portage, Wis.	1	Sandusky, Ohio.	1	Texarkana, Ark.	2	Williamstown, Mass.	1
Port Henry, N. Y.	1	Sanford, Fla.	1	Tiffin, Ohio.	1	Wilmington, Del.	1
Port Huron, Mich.	1	San Francisco, Cal.	3	Toledo, Ohio.	2	Wilmington, N. C.	1
Port Jervis, N. Y.	1	San Jose, Cal.	1	Tombstone, Ariz.	1	Wilmington, Ohio.	1
Portland, Me.	1	San Leandro, Cal.	1	Tonawanda, N. Y.	1	Winchester, Va.	1
Portland, Oreg.	2	San Luis Obispo, Cal.	1	Topeka, Kans.	1	Windham, Conn.	1
Portsmouth, N. H.	1	San Rafael, Cal.	1	Towanda, Pa.	1	Windsor, Vt.	1
Portsmouth, Ohio.	1	Santa Ana, Cal.	1	Trenton, Mo.	1	Winfield, Kans.	1
Portsmouth, Va.	1	Santa Cruz, Cal.	1	Trenton, N. J.	1	Winona, Minn.	1
Port Townsend, Wash.	1	Santa Rosa, Cal.	1	Trinidad, Colo.	1	Woburn, Mass.	1
Pottstown, Pa.	1	Saratoga Springs, N. Y.	1	Troy, N. Y.	1	Woodbury, N. J.	1
Pottsville, Pa.	1	Saugerties, N. Y.	1	Troy, Ohio.	1	Woodland, Cal.	1
Poughkeepsie, N. Y.	1	Savannah, Ga.	1	Tucson, Ariz.	1	Woodstock, Vt.	1
Princeton, Ill.	1	Schenectady, N. Y.	1	Tyrone, Pa.	1	Woonsocket, R. I.	1
Princeton, N. J.	1	Schuylkill Haven, Pa.	1	Uniontown, Pa.	1	Wooster, Ohio.	1
Providence, R. I.	1	Seranton, Pa.	1	Upper Sandusky, Ohio.	1	Worcester, Mass.	1
Pueblo, Colo.	1	Seattle, Wash.	1	Urbana, Ohio.	1	Wyncote, Pa.	1
Putnam, Conn.	1	Sedalia, Mo.	1	Utica, N. Y.	1	Xenia, Ohio.	1
Quincy, Ill.	1	Selma, Ala.	1	Vallejo, Cal.	1	Yonkers, N. Y.	1
Quincy, Mass.	1	Seneca Falls, N. Y.	1	Valparaiso, Ind.	1	York, Pa.	1
Racine, Wis.	1	Sewickley, Pa.	1	Van Wert, Ohio.	1	Youngstown, Ohio.	1
Raleigh, N. C.	1	Seymour, Ind.	1	Vernon, Conn.	1	Ypsilanti, Mich.	1
Ravenna, Ohio.	1	Shamokin, Pa.	1	Viicksburg, Miss.	1	Zanesville, Ohio.	1
Reading, Pa.	1	Sharon, Pa.	1	Vincennes, Ind.	1		

There are 827 cities and towns represented by the 877 establishments from which returns were received. Of the 877 establishments, 200 are in localities having less than 5,000 inhabitants; 260 in cities and towns having a population of from 5,000 to 10,000; 177 in cities of from 10,000 to 20,000; 47 in cities of from 20,000 to 25,000; 81 in cities of 25,000 and under 50,000; 44 in cities of 50,000 and under 100,000; 20 in cities of 100,000 and under 200,000; and 48 in cities of 200,000 and over. The most noteworthy feature indicated by the above figures is the fact that 460, or 52.5 per cent of the 877 gas plants from which reports were received, are in cities and towns of

less than 10,000 inhabitants. This is more than fifteen times the total number of gas establishments in the United States in 1850. Further, of the 460 plants located in cities and towns of less than 10,000 inhabitants, 200, or 22.8 per cent of the entire number reported, are in localities of less than 5,000 inhabitants, showing that in matters of illumination a goodly number of the smaller towns enjoy the same privileges as the larger cities.

Table 3 presents, by states and territories, the number of active gas establishments from which returns were received in 1890 and in 1900, with the increase and the number of plants constructed during the decade.

TABLE 3.—COMPARATIVE SUMMARY: NUMBER OF ACTIVE ESTABLISHMENTS, 1890 AND 1900, INCREASE, AND NUMBER CONSTRUCTED SINCE 1890, BY STATES AND TERRITORIES.

STATES AND TERRITORIES.	1900	1890	Increase.	Con-structed since 1890.	STATES AND TERRITORIES.	1900	1890	Increase.	Con-structed since 1890.
United States	877	742	135	66	Missouri	25	17	8	2
Alabama	11	7	4	2	Montana	2	1	1	
Arizona	3	2	1	2	Nebraska	9	9		
Arkansas	7	7		1	Nevada	3	2	1	
California	41	44	13	1	New Hampshire	13	13		1
Colorado	5	6	11		New Jersey	84	33	1	2
Connecticut	21	20	1		New Mexico	1	2	11	
Delaware	4	4		1	New York	101	94	7	6
District of Columbia	3	2	1	1	North Carolina	10	6	4	2
Florida	11	7	4	8	North Dakota	2	2		
Georgia	12	11	1	4	Ohio	73	61	12	5
Illinois	53	36	17	12	Oregon	5	4	1	1
Indiana	39	33	6	4	Pennsylvania	89	73	16	8
Iowa	26	19	7	2	Rhode Island	6	7	11	
Kansas	17	12	5		South Carolina	4	2	2	
Kentucky	17	14	3		South Dakota	2	2		
Louisiana	3	4	11		Tennessee	11	8	3	3
Maine	9	11	12		Texas	11	8	3	
Maryland	11	7	4	1	Utah	2	1	1	
Massachusetts	68	72	14	1	Vermont	7	8	11	
Michigan	38	27	11	5	Virginia	12	6	6	1
Minnesota	11	10	1		Washington	6	4	2	
Mississippi	5	2	3		West Virginia	8	3	5	1
					Wisconsin	25	18	7	
					Wyoming	1	1		

¹ Decrease.

Table 3 indicates that in 8 states there has been a decrease in the number of establishments. This decrease is caused, as noted above, by the number of establishments reporting in 1890 that in 1900 were either abandoned or had lost their identity through consolidation. It will be observed from Table 3 that the greatest increase in number of establishments reported was in Illinois, which showed an increase of 17, followed by Pennsylvania with 16 addi-

tional plants. Of the 66 establishments which commenced operations during the decade, 12 were located in Illinois, 6 in New York, and 5 each in Michigan and Ohio. In Arkansas, California, and Illinois new plants were constructed during the census year.

Table 4 is a comparative summary of capital for 1890 and 1900, with the proportion each item is of the total, and the per cent of increase for the decade.

TABLE 4.—CAPITAL: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	\$567,000,506	100.0	\$258,771,795	100.0	119.1
Land	50,050,371	8.8	45,521,707	17.6	9.9
Buildings	58,486,472	10.3	35,048,435	13.5	66.9
Machinery, tools, and implements	876,790,335	66.5	153,880,910	59.5	144.9
Live assets, total	81,673,828	14.4	24,370,743	9.4	235.1
Raw materials on hand			2,654,254	1.0	
Stock in process of manufacture, and finished products on hand, including by-products	6,888,208	1.2	1,914,136	0.7	49.7
Cash, surplus, reserve fund, bills and accounts receivable, and all sundries not elsewhere reported	74,835,120	13.2	19,802,853	7.7	277.9

While in the majority of cases, separate book accounts were not kept for the 269 establishments engaged in the production and distribution of gas in connection with electric light and power, an equitable division of the capital was made by the officials furnishing the information, so that the data may be accepted as fairly representing the capital engaged in the manufacture of gas.

The value of machinery, tools, and implements, including gas-making apparatus and machinery, gas-holders, consumers' meters, mains and services, teams, tools, horses, wagons, and other accessories, constituted the principal item reported for capital in both years. In 1900 this item amounted to \$376,790,335, or 66.5 per cent of the total capital, having increased \$222,959,425, or 144.9 per cent, since 1890, when the corresponding value was \$153,830,910. For the same period the value of land increased from \$45,521,707 to \$50,050,371, an increase of \$4,528,664, or 9.9 per cent; and the value of buildings, from \$35,048,435 to \$58,486,472; an increase of \$23,438,037, or 66.9 per cent. But land and buildings, while showing an absolute increase, now constitute a relatively smaller proportion of the total capital than in 1890. The land decreased from 17.6 per cent to 8.8 per cent, and the buildings from 13.5 per cent to 10.3 per cent, of all capital reported. A slight difference exists in the manner of reporting the live assets at the two censuses under comparison. In 1890 raw materials were separated from stock in process of manufacture and finished products, but in 1900 these items were combined.

Live assets, including raw materials, stock in process of manufacture, and finished products on hand, together with cash, surplus, reserve, bills and accounts receivable, and all other sundries, which amounted to \$24,370,743 in 1890 and \$81,673,328 in 1900, showed an increase of \$57,302,585, or 235.1 per cent. The large increase over 1890 in the items of cash, surplus, etc., is due partly to the accumulation of profits which are held as a reserve fund.

These figures do not represent the capital stock of the establishments engaged in the manufacture of gas, but they stand for the actual value of the plants, together

with the amount necessary for working capital. The returns indicate that to produce \$1 of gross product required \$3.47 of capital in 1850, \$2.40 in 1860, \$2.24 in 1870, \$4.54 in 1890, and \$7.49 in 1900.

The special schedule of inquiry for gas manufacture called for the amount of bonds issued by each company, and the rate of interest on the same; the amount of capital stock, preferred and common; and the amount of dividend paid during the year. Table 5 is a summary of amounts reported in reply to these inquiries.

TABLE 5.—BONDS AND STOCK.

Bonds:		
Amount issued	-----	\$192,669,181
Interest paid during the year	-----	9,471,575
Stock issued:		
Total	-----	376,035,803
Preferred	-----	26,143,832
Common	-----	349,891,921
Amount of dividend paid during the year	-----	15,842,138

In 1900 the total capital stock was \$376,035,803, as compared with \$229,746,552 in 1890, an increase of \$146,289,251, or 63.7 per cent, during the past ten years. Of the capital stock, \$349,891,921, or 93 per cent, was common, and the remainder, 7 per cent, preferred stock. The total capital reported as actually invested, \$567,000,506, exceeds the capital stock by \$190,964,703. Several establishments reported that they issued no capital stock, and the companies operating both gas and electric plants reported it impossible to segregate the bonds and stocks so as to report the exact amount directly chargeable to the gas plant. In many instances, the amounts reported for the gas plant were unquestionably too small.

The schedule of inquiry for 1890 was the first which contained questions designed to show the costs of manufacture other than for wages and materials. The questions of the Twelfth Census relating to miscellaneous expenses were made as nearly uniform as possible with those of the previous census, and the returns are shown in Table 6 in comparison with those of 1890, together with the proportion each item is of the total, and the per cent of increase from 1890 to 1900.

TABLE 6.—MISCELLANEOUS EXPENSES: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	\$14,769,022	100.0	\$7,799,385	100.0	89.4
Amount paid for rent, total	1,164,380	7.9	630,711	8.1	84.6
Rent of works	820,241	5.6			
Rent of offices	344,139	2.3			
Amount paid for taxes, including royalties and special tax	3,577,037	24.2	2,227,122	28.5	60.6
Amount paid for lamps and appliances purchased for sale	1,392,206	9.4			
Amount paid for advertising, interest, insurance, repairs, and other sundry expenses	8,655,399	58.5	4,941,552	63.4	74.8

The amount paid for insurance, ordinary repairs, interest, advertising, etc., is the principal item of the miscellaneous expenses reported. This amount includes no allowance for depreciation, or for expense incurred for

new equipment, extension of mains, etc. Interest in this item is not to be considered the same as the interest on bonds, shown in Table 5, but includes only the comparatively small sums paid for money or credit obtained from

time to time during the year, incident to the conduct of the business. The next to the largest item of miscellaneous expenses is the amount paid for taxes.

Table 7 is a comparative summary of the cost of the

different materials used in 1890 and 1900, with the proportion each is of the total cost of materials, and the per cent of increase from 1890 to 1900.

TABLE 7.—COST OF MATERIALS: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	\$20,605,356	100.0	\$14,037,087	100.0	46.8
Coal	7,161,472	34.8	8,797,851	62.7	¹ 18.6
Coke	726,736	3.5	190,312	1.4	281.8
Oil	8,168,657	39.6	3,483,005	24.8	184.5
Water	204,402	1.0	(²)		
Natural gas	(²)		19,389	0.1	
Oxide of iron	(²)		51,936	0.4	
Lime	(²)		428,590	3.0	
Fuel	1,082,844	5.3	524,249	3.7	106.6
Mill supplies	149,439	0.7	(²)		
All other materials	2,395,430	11.6	548,725	3.9	340.6
Freight	718,376	3.5	(²)		

¹ Decrease.

² Not reported separately.

The total cost of materials used in 1900 was \$20,605,356 as compared with \$14,037,087 in 1890, representing an increase of \$6,568,269, or 46.8 per cent. The quantities and values of the different materials used are presented in detail in Table 9, by states and territories.

Oil, crude and refined, is the largest single item of materials used in the manufacture of gas in 1900, its cost forming 39.6 per cent of the total cost of materials, as compared with 24.8 per cent in 1890. The relatively larger amount expended for oil in 1900 is due to the higher price of crude petroleum in 1900, and to the more extended use of oil for the purpose of enriching water gas, the manufacture of which has increased since 1890 much more rapidly than that of coal gas. This is evidenced by the fact that the cost of coal, which was the principal item of expense in 1890, forming 62.7 per cent of the cost of materials, is the second item of expense in 1900, forming but 34.8 per cent of the total. In 1890 coal gas formed 49.7 per cent of the value of products as compared with 38.1 per cent for water gas. The form of inquiry for 1900 did not call for the amount of each variety of gas sold, and it is impossible to arrive at the exact proportion of each kind from the materials used, since hard coal, coke, and oil are all used in the manufacture of water gas; but the conclusion seems to be warranted that over 75 per cent of the gas manufactured during the census year was water gas.

A water-gas plant is, in several respects, more advantageously operated than other systems of production. Probably the chief advantage is the smaller expenditure for labor. Moreover, the illuminating power of the water gas is higher than that of coal gas.

The cost of oil and coal varies with the distance from the source of supply, and the quality used in different sections of the country also differs noticeably. Furthermore, in many instances, the materials used were bought delivered, and it was found impossible to separate the amount chargeable to freight. The number of gallons of oil used is given as 194,857,296, costing \$8,168,657, an average

per gallon of \$0.042; the number of tons of coal consumed was reported as 2,487,287, costing \$7,164,472, an average of \$2.88 per ton. The figures given make no allowance for material bought delivered. The number of bushels of coke, shown in Table 9, includes 2,733,034 bushels of by-product coke used by the plants reporting the same, for which no value is given. If this quantity be deducted from the total amount reported, it shows that 12,481,759 bushels of coke were purchased for \$726,736, an average cost per bushel of \$0.058. In this connection it should be stated that the number of gallons and cost of water, as given in Table 9, must not be taken as strictly accurate, inasmuch as some establishments reported the cost of water, but were unable even to approximate the number of gallons, while other establishments gave the number of gallons of water consumed, but stated that there was no cost attached to the same.

The total value of products, \$75,716,693, as given in Table 1, for 1900, as compared with \$56,987,290 for 1890, shows an increase of \$18,729,403, or 32.9 per cent, during the past decade. The value of the principal product, gas sold, amounted to \$69,432,582, an increase of \$17,565,751, or 33.9 per cent, over the \$51,866,831 reported for 1890. The value of by-products, \$6,284,111, including \$2,000,907 received from rents and sales of appliances, formed 8.3 per cent of the total value of products in 1900, and showed an increase of 22.7 per cent over the \$5,120,459 reported in 1890. The by-products include tar, coke, and ammoniacal liquor, but the quantities and values of each were not reported separately.

The amount reported, \$75,716,693, as the total value of all products, does not include the value of the gas and by-products consumed at the offices and works, the value of gas lost by leakage, nor does it include returns for several gas companies and so-called pipe-line companies which manufactured no gas, but purchased the same, for distribution, from gas manufacturing establishments.

The total quantity of gas sold for lighting and heating, as reported by the 877 gas establishments from which re-

turns were received, was 67,093,553,471 cubic feet. In addition to this quantity, the special report on the manufacture of coke at the Twelfth Census shows that there were 6 establishments manufacturing gas as a by-product, which they sold to gas manufacturers or to distributing companies to be resold for lighting and heating purposes. The total quantity of gas manufactured and disposed of in this manner was 1,171,942,697 cubic feet. A combination of this latter quantity with the quantity reported for gas companies shows that, in 1900, the total quantity sold was 68,265,496,168 cubic feet, as compared with 36,519,511,510 cubic feet reported for 1890, an increase of 31,745,984,658 cubic feet, or 86.9 per cent. The gas manufactured and sold by coke companies was valued at \$225,022, an average of \$0.192 per thousand cubic feet, as compared with an average for the United States of \$1.035

per thousand cubic feet for retort and water gas. In this connection, however, attention is called to the fact that the consumer does not receive gas for this price, as establishments using the by-product system do not sell directly to the consumer.

The average price of gas in 1890 was \$1.42 per thousand cubic feet, while in 1900 the average price had fallen to \$1.035 per thousand cubic feet, a decrease of \$0.385, or 27.1 per cent. This average is computed from the totals of the whole number of establishments from which reports were received, and must not be assumed to be indicative of the price in any particular section of the country.

Table 8 shows the total quantity and value of gas sold, and the average price per thousand cubic feet in each state and in each group of states for 1900.

TABLE 8.—QUANTITY, VALUE, AND AVERAGE VALUE PER 1,000 CUBIC FEET OF GAS MANUFACTURED, BY STATES AND TERRITORIES: 1900.

	Quantity, cubic feet.	Value.	Average value per 1,000 cubic feet.		Quantity, cubic feet.	Value.	Average value per 1,000 cubic feet.
United States.....	67,093,553,471	\$69,432,582	\$1.035	North Central division—continued.			
North Atlantic division.....	39,176,052,733	38,605,165	.985	Minnesota.....	762,851,693	\$979,004	\$1.300
Maine.....	165,054,440	246,861	1.496	Iowa.....	477,328,202	649,526	1.361
New Hampshire.....	212,670,017	300,478	1.413	Missouri.....	2,605,744,576	2,526,418	.970
Vermont.....	35,836,400	65,250	1.818	North Dakota.....	26,000,000	52,800	2.031
Massachusetts.....	4,678,442,731	6,856,501	1.446	South Dakota.....	19,508,005	85,837	1.837
Rhode Island.....	765,556,032	830,302	1.085	Nebraska.....	381,399,194	482,155	1.454
Connecticut.....	1,047,838,014	1,282,988	1.235	Kansas.....	173,812,220	290,588	1.672
New York.....	20,741,546,599	19,857,727	.957	South Central division.....	1,394,252,117	2,199,068	1.572
New Jersey.....	2,743,758,799	3,319,449	1.210	Kentucky.....	447,352,340	574,627	1.285
Pennsylvania.....	8,700,299,501	7,310,059	.832	Tennessee.....	344,411,892	476,214	1.383
South Atlantic division.....	3,910,272,412	4,681,123	1.197	Alabama.....	122,636,152	193,865	1.622
Delaware.....	191,844,225	176,690	.920	Mississippi.....	86,716,805	74,041	2.017
Maryland.....	1,414,721,120	1,770,869	1.252	Louisiana.....	204,503,400	428,605	2.096
District of Columbia.....	1,073,210,187	1,192,712	1.109	Texas.....	172,088,580	317,531	1.845
Virginia.....	406,212,000	488,871	1.200	Oklahoma.....			
West Virginia.....	116,980,430	126,598	.861	Arkansas.....	66,543,948	129,185	1.941
North Carolina.....	46,451,300	110,956	2.389	Indian Territory.....			
South Carolina.....	95,332,400	152,756	1.587	Western division.....	2,310,509,538	3,886,195	1.682
Georgia.....	451,946,212	558,182	1.235	Montana.....	26,070,000	59,632	2.287
Florida.....	78,022,877	154,290	1.977	Wyoming.....	5,565,400	9,600	1.725
North Central division.....	20,302,466,676	20,061,031	.988	Colorado.....	346,248,400	439,460	1.269
Ohio.....	3,440,297,822	3,263,940	.949	New Mexico.....	4,665,000	11,205	2.402
Indiana.....	764,135,883	875,247	1.145	Arizona.....	7,090,000	17,080	2.412
Illinois.....	9,892,071,196	8,478,773	.903	Utah.....	81,000,000	36,022	1.162
Michigan.....	1,127,095,479	1,224,724	1.087	Nevada.....	4,878,900	21,934	4.500
Wisconsin.....	1,192,222,406	1,202,019	1.008	Washington.....	188,270,703	256,676	1.356
				Oregon.....	67,655,008	150,442	2.224
				California.....	1,679,078,130	2,884,144	1.718

Table 8 shows that the largest quantity of gas was sold in the North Atlantic division, which consumed 39,176,052,733 cubic feet, or more than the combined product of the 4 other groups of states, and 58.4 per cent of the total quantity sold in the United States. The average price per thousand cubic feet was \$0.985, which was practically the same as that given for the North Central division, and less than that reported for any of the remaining groups. The state of New York, with 20,741,546,599 cubic feet, at an average price of \$0.957 per thousand, used more than any other state, and more than the combined total of the other states in this group or all the states in any other group; its consumption constituted 30.9 per cent of the total for the United States. The group producing the least quantity was the South Central division, with 1,394,252,117 cubic feet at an average price of \$1.572 per thousand. The smallest quantity sold in any state or territory was 4,665,000 cubic feet, in New Mexico, at an average price of \$2.402 per thousand.

The price per 1,000 cubic feet varied from \$0.832 in Pennsylvania, to \$4.50 in Nevada. Proximity to the coal and oil producing districts gives to Pennsylvania the minimum average rate, while distance from source of supplies and limited transportation facilities are accountable for the high price in Nevada. These averages represent the price of all manufactured gas, both fuel and illuminating, as the quantity of each kind was not separately reported; this statement is necessary in order to obviate erroneous deductions. Idaho, Indian Territory, and Oklahoma have no gas plants.

The quantity of gas sold in New York city was 18,180,821,125 cubic feet, at an average price of \$0.905 per 1,000, or \$16,457,822 in the aggregate. This represents 27.1 per cent of the total quantity sold in the United States during the census year. In this connection it is interesting to note the quantity, value, and average price obtained in Chicago, Philadelphia, St. Louis, and Boston, which, after New York, are the largest cities in the United

States, in the order named. The quantity sold for public use in Chicago reached 8,367,801,185 cubic feet, valued at \$7,288,187, an average of \$0.871 per thousand cubic feet. In Philadelphia 7,055,559,210 cubic feet sold for \$5,372,774, an average of \$0.761 per thousand. This is the lowest average price reported in any city. St. Louis consumed 1,607,230,800 cubic feet, valued at \$1,494,616, an average of \$0.93 per thousand cubic feet. In Boston there were 2,510,635,235 cubic feet of gas burned, with a value of \$2,594,852, or \$1.034 per thousand cubic feet.

HISTORICAL AND DESCRIPTIVE.

The history of the gas industry, not only of the United States but of the world, covers little more than a century. The possibility of manufacturing gas for illuminating purposes was investigated simultaneously in England and France in the latter part of the Eighteenth century—in England by William Murdock, in France by Philippe Le Bon—and it is still a question of dispute between the two countries as to which of these experimenters is entitled to the credit for this important discovery.¹

The history of the gas industry in this country dates from 1806, at which time David Melville, of Newport, R. I., lighted his premises by means of coal gas which he had manufactured thereon. This took place nine years after the experiments in England. The apparatus first used by Melville was necessarily crude, but underwent improvements from time to time, until, in 1813, he secured a patent, and later used gas for the lighting of a cotton mill at Watertown, Mass. Gas was also used at about this time in a mill near Providence, R. I., and was employed in 1817 as an illuminant in a lighthouse. The growth of the industry was at first slow, but with the vast advance in the details of the construction and operation of gas plants, the improvement and development of special tools and appliances, and the increasing knowledge, gained by experience, of the laws of physics involved, there came a much more rapid growth. As early as 1816 a company was chartered in Baltimore, Md., followed, in 1822, by the establishment of a plant in Boston, Mass. New York city adopted gas lighting in 1823, and two years later companies were formed in Brooklyn, N. Y., and Bristol, R. I. New Orleans was the next city to adopt gas, in 1835, twenty-nine years after Melville introduced the new illuminant in this country. A glance at the early history of these pioneer companies, as far as it is available, indicates a series of failures. Not only was it a difficult matter to secure the necessary capital to erect and operate a plant, but for some time the introduction of gas was strongly opposed on the ground that the erection of gas works and the distribution of the product endangered the health and lives of the inhabitants of the surrounding community. Opposition on this score was gradually overcome, however, and the different municipalities granted the petitioners the desired charters.

Gas as an illuminant has had several competitors, which, at the time of their appearance in the field, seriously threatened its existence. In the early days of the industry the gas manufactured had an illuminating value of about 15 to 17 candlepower. Compared with the light of candles

or of the crude whale-oil lamps then in use, it was considered a wonderful illuminant. This superiority was soon threatened, however, by the introduction of kerosene and improved oil lamps, the general use of which interfered seriously with the rapid increase of the sale of gas. At this time, about 1870, gas was undoubtedly safer, but was still much higher in price per unit of light than oil lamps, and for this reason could not compete with kerosene. Its value for cooking and heating purposes had yet to be demonstrated.

These conditions would have retarded greatly the growth of the industry, had not the problem been solved by Du Motay and Lowe—the former a Frenchman, the latter an American—who, independently of each other, were carrying on experiments which were to result in the introduction of the so-called water gas. The investigations of both Du Motay and Lowe were conducted in this country, and the most important inventions affecting the manufacture of gas have been introduced here, so that the development of the water-gas industry is purely American. This gas is manufactured by a process in which hydrogen and the oxides of carbon, produced by the action of steam upon carbon at a high temperature, are mixed and then combined with richly carbureted gases, usually from petroleum, thus producing the power of illumination. The first plant using the Lowe process was erected at Phoenixville, Pa., in 1873. From that time until about 1880 this new process of making gas was vigorously opposed by coal-gas manufacturers. Gradually the opposition was overcome, and since 1880 many coal-gas makers have adopted the water-gas process, and the increase in the sales of water gas has been enormous. At present, although the exact figures are not available, the amount of water gas sold for public use is in the neighborhood of 75 per cent of the entire quantity of gas sold.

A few years after the introduction of water gas as an illuminant, a new rival appeared in the form of electricity, which, while it did not displace gas in general use, yet caused the manufacturer great uneasiness. However, the appearance of the electric light was not without its advantage to the gas interests, as it demonstrated to them the necessity of finding other uses for gas than those of illumination. The result was the introduction of gas stoves for cooking and heating purposes, the sales for which have increased enormously during the past decade. Gas engines, also, are growing in favor, on account of both economy and convenience. By far the most potent factor which is enabling gas to compete with electric light, and thus contributing to increase the consumption of gas, is the widespread use of the Welsbach—named for the inventor, Auer von Welsbach, of Vienna—or incandescent mantle, which develops an illuminating power of 20 candles per cubic foot. Its introduction gave a decided stimulus to the gas industry. Thus, although the use of electricity for lighting purposes is increasing much more rapidly than is that of gas, the consumption of gas, also, shows a marked increase.

Table 9, which accompanies this report, shows in detail the statistics relating to the manufacture of gas as returned by the 877 establishments reporting; the 15 plants controlled by municipalities are separately presented in Table 10.

¹ One Hundred Years of American Commerce, American Gas Interests, by Emerson McMillin, Volume I, pages 295-297.

TABLE 9.—GAS MANUFACTURES BY

STATES AND TERRITORIES.	ESTABLISHMENTS.			BONDS AND STOCK.					
	Number reporting.	Estab-lished dur-ing decade.	Estab-lished dur-ing census year.	Bonds.		Stock.			Amount of dividend paid during the year.
				Amount issued.	Amount of interest paid during the year.	Amount issued.			
						Total.	Preferred.	Common.	
1 United States	877	66	3	\$192,669,181	\$9,471,575	\$376,035,803	\$26,143,582	\$349,891,921	\$15,812,138
2 Alabama	11	2		897,000	51,040	1,408,300		1,408,300	3,750
3 Arizona	3	2		65,500	14,850	407,350		407,350	
4 Arkansas	7	1	1	406,000	118,442	22,984,050	23,500	22,910,550	1,159,952
5 California	41	1	1	8,421,500	37,821	990,000	250,000	740,000	8,407
6 Colorado	5								
7 Connecticut	21			1,939,000	77,489	5,410,850		5,410,850	284,013
8 Delaware	4			29,000	40,000	662,000		662,000	70,760
9 District of Columbia	3	1		600,000	36,000	2,750,000		2,750,000	405,000
10 Florida	11	3		191,300	12,305	737,000	9,100	727,900	
11 Georgia	12	4		1,943,500	78,310	2,692,590	760,510	1,932,050	41,672
12 Illinois	53	12	1	28,200,800	2,043,991	40,877,080	20,000	40,857,080	1,957,507
13 Indiana	33	4		3,939,633	225,583	4,323,900	32,500	4,291,400	90,930
14 Iowa	26	2		1,337,700	67,897	2,923,250	125,000	2,798,250	51,062
15 Kansas	17			691,550	38,083	1,091,900	71,900	1,020,000	25,620
16 Kentucky	17			871,866	40,891	4,728,366	7,500	4,720,866	196,407
17 Louisiana	3			127,000	5,720	3,850,000		3,850,000	187,500
18 Maine	9			494,800	22,858	950,300		950,300	40,577
19 Maryland	68	1		6,921,500	391,614	11,147,000		11,147,000	438,000
20 Massachusetts	11	1		1,983,900	90,414	16,535,801	21,800	16,514,001	1,449,510
21 Michigan	38	5		6,815,600	341,013	8,039,675		8,039,675	232,771
22 Minnesota	11			6,039,833	333,190	2,450,000		2,450,000	121,500
23 Mississippi	5			110,000	900	324,100		324,100	12,300
24 Missouri	25	2		15,067,500	758,042	17,066,500	2,500,000	14,566,500	388,723
25 Nebraska	9			1,930,000	105,105	4,640,000	1,300,000	3,340,000	103,500
26 Nevada	3			21,500	1,290	221,500		221,500	3,000
27 New Hampshire	13	1		63,000	770	1,202,800	65,000	1,137,800	57,410
28 New Jersey	31	2		13,824,847	350,581	25,040,286	8,142	25,032,144	146,167
29 New York	161	6		55,462,916	2,762,463	117,030,516	15,538,400	101,492,116	4,051,211
30 North Carolina	10	2		315,000	12,317	477,000	35,000	442,000	7,500
31 Ohio	73	5		3,646,793	191,123	20,063,750	180,000	19,883,750	1,311,863
32 Oregon	5	1		1,023,500	61,645	1,064,250		1,064,250	
33 Pennsylvania	89	3		17,791,610	833,415	37,464,529	5,138,000	32,326,529	1,036,262
34 Rhode Island	6			100,000	5,500	4,007,500	7,500	4,000,000	238,000
35 South Carolina	4			30,000		933,500		933,500	40,000
36 Tennessee	11	3		1,045,000	51,314	2,468,000		2,468,000	92,911
37 Texas	11			703,833	42,230	1,814,170		1,814,170	86,221
38 Vermont	7			76,000	4,050	335,000		335,000	12,400
39 Virginia	12	1		648,000	41,314	1,195,875		1,195,875	38,578
40 Washington	6			711,000	39,050	1,065,000	50,000	1,015,000	7,000
41 West Virginia	8	1		72,700	4,315	301,500		301,500	11,132
42 Wisconsin	25			1,311,000	75,080	3,136,225		3,136,225	455,820
43 All other states ¹	10			775,000	48,550	1,208,800		1,208,800	12,000

¹ Includes establishments distributed as follows: Montana, 2; New Mexico, 1; North Dakota, 2; South Dakota, 2; Utah, 2; Wyoming, 1.

STATES AND TERRITORIES: 1900.

CAPITAL.						SALARIED OFFICIALS, CLERKS, ETC.						WAGE-EARNERS, INCLUDING PIECE-WORKERS.		
Total.	Land.	Buildings.	Machinery and gas-making apparatus, holders, mains, meters, teams, tools, horses, wagons, and other accessories.	Raw materials, and finished products on hand, including by-products.	Cash on hand, surplus, reserve fund (invested or otherwise), bills and unsettled ledger accounts receivable, and sundries not included in any of the foregoing items.	Total.		Men.		Women.		Greatest number employed at any one time during the year.	Least number employed at any one time during the year.	
						Number.	Salaries.	Number.	Salaries.	Number.	Salaries.			
\$567,000,506	\$50,050,371	\$58,486,472	\$376,790,335	\$6,838,208	\$74,835,120	5,904	\$5,273,500	5,521	\$5,113,217	353	\$160,283	30,813	20,361	I
1,120,539	47,300	145,520	330,996	19,805	76,918	40	30,674	40	30,674	---	---	130	59	2
70,150	2,200	2,600	63,500	250	1,600	6	2,020	6	2,020	---	---	8	4	3
822,285	62,000	62,575	474,462	43,100	187,148	23	16,469	23	16,469	---	---	71	22	4
20,487,350	1,730,002	926,457	16,615,701	401,839	813,351	203	229,285	192	222,985	11	6,300	816	640	5
1,773,308	206,000	233,000	1,217,366	39,890	77,052	28	27,048	27	26,928	1	120	150	88	6
7,905,046	619,043	649,105	5,551,596	119,326	966,876	134	117,238	117	109,299	17	7,939	536	230	7
771,842	67,775	49,125	550,597	9,340	95,005	21	18,285	20	18,210	1	75	71	63	8
4,865,623	270,724	686,900	3,414,767	88,326	404,406	40	105,908	45	102,542	4	3,366	391	373	9
1,155,689	67,386	61,615	877,490	55,133	94,065	28	16,228	25	15,346	3	832	92	30	10
4,269,319	313,250	260,306	3,418,216	125,642	156,405	75	56,314	71	58,734	4	2,580	372	230	11
76,316,408	2,915,496	5,991,110	66,210,918	680,665	1,668,219	827	769,514	781	750,028	46	19,486	4,001	2,280	12
7,745,659	533,090	586,047	6,335,396	87,522	203,104	146	39,324	138	36,684	8	2,640	521	300	13
4,129,984	241,338	258,452	3,825,820	128,292	176,082	90	70,120	83	67,326	7	2,794	474	207	14
1,414,636	123,657	137,672	1,012,067	22,080	119,150	50	25,595	47	25,015	3	580	112	65	15
4,495,722	304,077	310,185	3,570,690	85,722	276,048	60	51,129	55	48,389	5	2,740	346	238	16
1,706,847	73,171	107,233	1,364,171	18,343	143,929	34	37,143	33	37,115	1	23	83	54	17
1,426,118	143,161	178,500	910,556	61,728	132,173	47	29,068	42	27,714	5	1,354	90	52	18
18,554,361	1,018,185	744,980	1,324,334	122,492	14,848,770	84	84,757	84	84,757	---	---	243	218	19
30,032,578	3,591,388	6,621,853	16,941,434	558,361	2,319,542	434	420,085	374	389,909	60	30,176	1,981	1,851	20
16,295,053	440,963	300,244	14,368,428	232,033	458,385	227	142,307	168	121,233	59	21,014	1,321	621	21
8,899,676	441,404	1,889,461	6,146,982	70,216	351,613	58	48,354	53	46,418	5	1,936	577	316	22
421,988	26,000	53,500	316,989	9,434	16,065	11	10,548	11	10,548	---	---	30	20	23
33,504,380	2,496,192	2,469,645	25,043,913	345,272	3,149,358	150	112,451	145	110,461	5	1,990	1,036	778	24
6,956,168	315,200	499,184	5,981,512	56,514	100,753	39	36,885	39	36,885	---	---	451	250	25
84,211	1,950	10,450	63,931	2,581	5,299	3	4,460	3	4,460	---	---	3	3	26
1,518,718	136,500	336,200	845,251	62,331	138,386	35	25,409	34	25,159	1	250	166	110	27
38,372,444	2,119,343	2,332,275	31,743,126	421,798	2,255,902	347	271,695	334	266,003	13	5,692	2,003	1,210	23
171,379,067	23,719,690	24,384,916	91,224,969	1,440,576	30,608,916	1,324	1,320,036	1,277	1,299,458	47	20,578	6,810	4,925	29
632,566	38,900	36,900	541,698	13,263	52,015	19	14,579	19	14,579	---	---	49	45	30
26,017,057	2,503,835	3,258,561	17,029,003	227,306	1,998,352	233	277,204	253	268,669	25	8,535	1,890	1,240	31
1,533,107	140,500	277,000	1,064,289	45,084	6,234	15	13,780	15	13,780	---	---	80	25	32
47,312,537	2,654,903	2,861,606	31,235,121	994,566	9,566,338	577	457,092	551	448,144	26	8,948	3,745	2,726	33
5,664,453	716,630	580,607	3,207,171	18,439	1,141,606	45	49,850	41	47,858	4	1,992	466	417	34
961,033	42,000	81,607	664,237	7,130	166,599	23	11,649	22	11,547	1	102	134	90	35
2,303,544	284,000	193,400	1,656,370	66,878	97,896	49	41,049	48	40,789	1	260	255	190	36
1,763,597	206,704	127,794	1,311,890	28,904	88,305	41	46,037	40	45,137	1	900	113	55	37
477,099	28,950	48,000	341,277	7,675	51,197	13	6,515	12	6,359	1	156	37	10	38
2,624,623	100,777	168,523	2,141,807	22,904	190,612	53	42,139	51	41,479	2	660	189	106	39
1,620,992	215,504	51,963	1,288,637	15,291	49,547	37	25,526	36	24,936	1	540	150	61	40
566,827	49,500	35,500	439,600	13,634	28,593	20	10,484	26	10,484	---	---	122	64	41
7,375,192	955,880	373,998	4,402,144	137,303	1,605,867	123	89,285	110	84,875	13	4,410	703	481	42
1,594,810	85,800	197,153	1,227,763	30,660	53,434	27	19,962	25	18,702	2	1,260	95	51	43

TABLE 9.—GAS MANUFACTURES BY STATES

STATES AND TERRITORIES.	WAGE-EARNERS, INCLUDING PIECEWORKERS—continued.								MATERIALS USED.			
	Total.		Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.		Aggregate cost.	For gas making.		
	Average number.	Wages.	Average number.	Wages.	Average number.	Wages.	Average number.	Wages.		Total cost.	Coal.	
											Tons.	Cost.
1 United States.....	22,459	\$12,486,296	22,446	\$12,481,294	10	\$4,256	3	\$806	\$20,665,356	\$16,264,267	2,487,287	\$7,164,472
2 Alabama.....	75	31,611	75	31,611				61,010	29,709	22,642	23,143	
3 Arizona.....	4	2,850	4	2,850				7,790	3,722			
4 Arkansas.....	34	21,539	34	21,539				38,228	30,344	5,602	18,163	
5 California.....	707	497,237	706	496,537			2	650	895,833	309,205	86,755	498,326
6 Colorado.....	109	54,051	109	54,051				122,839	63,523	24,100	23,431	
7 Connecticut.....	354	231,102	354	231,102				362,248	315,720	62,328	191,494	
8 Delaware.....	67	31,958	67	31,958				50,853	43,048	10,733	22,554	
9 District of Columbia.....	382	202,796	382	202,796				368,939	347,635	31,691	100,970	
10 Florida.....	47	24,108	47	24,108				41,324	30,395	2,733	11,935	
11 Georgia.....	271	92,265	271	92,265				141,507	119,464	85,074	74,013	
12 Illinois.....	2,371	1,305,670	2,371	1,305,670				1,990,547	1,722,198	100,902	234,719	
13 Indiana.....	340	172,431	340	172,431				255,864	187,338	64,024	125,564	
14 Iowa.....	229	118,307	225	118,161			1	150	203,961	156,159	24,774	65,326
15 Kansas.....	85	48,562	85	48,562				100,597	77,048	20,620	54,687	
16 Kentucky.....	279	121,744	279	121,744				139,194	117,865	49,092	90,695	
17 Louisiana.....	61	40,665	61	40,665				71,114	62,474	3,882	14,575	
18 Maine.....	61	37,953	61	37,953				78,394	55,877	12,612	35,439	
19 Maryland.....	237	136,980	237	136,980				431,013	400,769	23,378	99,634	
20 Massachusetts.....	1,409	813,459	1,406	811,537	3	1,372		1,651,373	1,482,700	224,723	790,733	
21 Michigan.....	653	298,976	657	293,672	1	304		298,321	176,459	72,601	114,540	
22 Minnesota.....	375	168,553	375	168,553				303,368	235,824	41,218	117,499	
23 Mississippi.....	24	9,164	24	9,164				16,748	13,052	3,621	9,122	
24 Missouri.....	334	464,417	334	464,417				756,437	523,190	146,303	371,715	
25 Nebraska.....	290	79,352	290	79,352				134,352	102,007	7,390	36,492	
26 Nevada.....	3	2,630	3	2,630				9,333	2,250	715	1,496	
27 New Hampshire.....	121	59,780	121	59,780				85,939	76,754	13,032	49,126	
28 New Jersey.....	1,320	634,219	1,320	634,219				735,979	704,622	111,459	308,627	
29 New York.....	5,331	3,675,712	5,379	3,675,392	2	320		5,366,549	5,223,064	370,943	1,320,567	
30 North Carolina.....	47	14,250	47	14,250				37,370	19,064	5,272	10,357	
31 Ohio.....	1,339	601,315	1,337	601,055	2	720		834,537	753,527	350,734	572,671	
32 Oregon.....	28	18,764	28	18,764				52,704	44,125	7,283	38,706	
33 Pennsylvania.....	3,144	1,506,266	3,143	1,506,146	1	120		3,150,655	1,253,270	269,280	558,082	
34 Rhode Island.....	430	249,021	430	249,021				244,124	223,296	48,238	140,003	
35 South Carolina.....	104	30,127	104	30,127				38,440	35,116	10,165	28,153	
36 Tennessee.....	213	64,539	213	64,539				135,110	118,300	52,170	108,245	
37 Texas.....	71	46,166	71	46,166				94,130	69,212	19,435	62,854	
38 Vermont.....	15	7,837	15	7,837				20,121	18,225	1,173	6,033	
39 Virginia.....	133	84,301	133	84,301				130,759	113,039	23,294	54,364	
40 Washington.....	31	42,048	31	42,048				76,929	64,374	13,739	52,946	
41 West Virginia.....	30	39,030	30	39,030				32,973	29,131	22,320	26,865	
42 Wisconsin.....	332	268,459	331	268,039	1	420		321,047	241,443	70,368	150,084	
43 All other states.....	62	37,536	62	37,536				79,543	68,290	8,237	36,124	

AND TERRITORIES: 1900—Continued.

MATERIALS USED—continued.										
For gas making—Continued.						Cost of fuel for boilers and retorts.	Cost of mill supplies.	Cost of all other materials, including purification supplies.	Amount of freight paid.	
Coke.		Oil.		Water.						
Bushels.	Cost.	Gallons.	Cost.	Gallons.	Cost.					
16,214,798	\$726,736	194,857,296	\$8,168,657	1,250,862,092	\$204,402	\$1,082,844	\$149,439	\$2,395,430	\$713,376	1
96,480		25,000	864	2,144,200	702	1,777	669	1,880	16,975	2
		98,858	3,627	190,242,000	195	707	75	125	3,101	3
62,731	795	152,785	9,978	4,986,000	1,408	1,153	514	1,100	5,112	4
39,989	6,141	5,911,761	299,488	3,203,300	4,650	39,680	2,132	22,830	28,006	5
206,228	11,827	785,040	23,386	855,000	429	17,041	1,206	1,344	39,725	6
130,702	6,488	2,589,084	113,932	32,766,699	3,806	28,642	1,201	14,422	7,263	7
3,573		604,131	24,121	20,477,000	1,073	186	280	1,727	612	8
461,855	23,093	4,913,214	219,956	47,195,500	1,616	13,012	650	4,642		9
		376,645	19,443	389,002	367	3,995	409	2,079	3,286	10
		949,879	44,416	7,900,448	1,035	6,398	645	6,112	8,888	11
5,828,721	376,563	38,611,335	1,098,486	119,002,933	12,440	120,695	43,678	19,466	84,510	12
336,349	13,694	1,675,809	46,193	13,809,429	2,437	25,938	2,246	14,885	24,862	13
148,440	16,671	1,714,447	69,723	27,348,838	8,839	18,230	635	5,625	28,262	14
36,999	2,098	482,448	18,289	2,403,800	1,374	10,161	1,041	6,809	11,538	15
93,719	4,820	858,591	12,048	4,198,750	1,302	2,973	143	14,491	3,722	16
185,500	11,841	898,716	36,106		449	6,112	192	649	1,687	17
38,980	99	410,935	19,433	8,191,857	356	6,951	1,116	1,526	7,924	18
8,000	147	6,795,919	300,003	61,320,736	335	46,221	10,282	16,927	6,814	19
741,022	44,370	17,148,844	630,647	36,219,986	16,894	82,584	7,415	37,944	41,230	20
525,438	15,443	2,030,285	44,715	12,102,775	1,761	28,547	4,009	23,815	64,891	21
470,591	25,731	2,818,860	92,194	56,836,224	400	31,405	7,060	23,714	865	22
10,500		98,127	3,595	1,870,219	335	943	282	642	1,824	23
839,857	6,176	6,757,240	241,665	37,132,330	8,634	23,074	1,903	74,837	28,453	24
3,600		1,406,739	59,920	7,921,000	5,595	19,813	563	1,820	10,110	25
		4,825	190		564			210	6,923	26
4,562	274	640,643	26,487	4,263,434	867	5,063	211	2,702	1,119	27
192,148	2,884	10,504,542	384,051	36,633,608	9,060	37,226	3,989	7,359	27,783	28
1,740,808	17,264	55,355,504	3,288,342	202,348,250	87,891	349,359	27,217	176,708	90,201	29
42,460	1,270	209,257	7,897	10,000	40	1,814	241	3,687	12,564	30
1,888,366	58,143	3,029,683	105,783	58,681,186	6,925	82,477	2,339	42,556	53,188	31
		105,261	4,771	1,080,000	648	3,748	134	1,072	2,725	32
498,630	17,946	19,846,645	669,934	137,481,542	12,358	55,647	10,253	1,811,294	20,191	33
80,000		2,800,326	79,374	82,017,875	5,909	1,030	277	17,531		34
215,754		120,616	6,478	2,969,209	455	715	100	1,279	1,230	35
5,000	400	173,529	8,598	1,919,905	1,557	3,803	668	7,609	4,230	36
37,556		206,442	5,017	1,936,090	1,311	3,968	364	2,264	23,372	37
9,000	720	245,288	10,821	203,000	601	1,187	95	200	534	38
123,533	10,399	1,078,131	46,785	11,188,857	1,041	3,874	636	2,518	10,692	39
107,750	8,590	31,805	2,259	2,391,000	579	299	172	575	11,509	40
23,550	825	28,375	1,008	9,555,500	883	386	238	2,063	1,110	41
509,402	23,638	3,126,954	66,565	3,750,775	956	47,554	7,519	6,726	17,975	42
77,060	9,272	380,393	22,139	1,338,750	755	4,396	400	3,117	3,340	43

TABLE 9.—GAS MANUFACTURES BY STATES

STATES AND TERRITORIES.	MISCELLANEOUS EXPENSES.						PRODUCTS.				
	Total.	Amount paid for rent of—		Amount paid for taxes, including royalties and special tax.	Amount paid for lamps and appliances purchased for sale.	Amount paid for insurance, ordinary repairs of buildings, machinery, tools, mains, lamps, and appliances, interest, freight, advertising, and all other sundry expenses.	Total value.	Gas sold.		All other products, including by-products, coke, tar, etc., sold.	Receipts from rents and sales of appliances.
		Works.	Offices.					Feet.	Value.		
1 United States.....	\$14,760,022	\$820,241	\$344,139	\$3,577,037	\$1,892,206	\$8,685,899	\$75,716,698	67,098,558,471	\$69,482,582	\$4,283,204	\$2,000,907
2 Alabama.....	54,896	—	1,544	11,989	6,580	34,833	282,802	122,635,152	198,865	28,692	5,245
3 Arizona.....	5,091	200	300	1,087	1,021	2,483	18,450	7,080,000	17,080	170	1,200
4 Arkansas.....	24,458	—	840	4,356	6,569	12,693	188,921	66,543,948	129,135	6,871	2,915
5 California.....	604,847	55,280	10,800	126,423	34,994	377,400	3,162,338	1,679,078,130	2,884,144	225,149	59,040
6 Colorado.....	100,196	—	3,816	27,469	27,450	41,402	523,497	346,248,400	439,460	61,278	22,764
7 Connecticut.....	392,898	33,975	6,227	61,253	43,746	187,197	1,421,014	1,047,888,014	1,262,683	89,389	68,342
8 Delaware.....	21,034	—	320	3,159	7,909	9,846	199,760	191,844,226	176,090	14,717	8,959
9 District of Columbia.....	66,687	300	2,328	44,888	4,271	14,850	1,220,391	1,076,210,187	1,192,712	28,091	4,588
10 Florida.....	54,445	136	1,886	6,547	8,224	38,052	170,297	78,022,877	154,290	6,563	10,444
11 Georgia.....	185,602	24,000	5,812	24,140	46,785	85,865	660,892	451,946,212	658,182	49,690	53,020
12 Illinois.....	1,046,946	2,127	56,496	404,668	67,264	516,490	8,774,058	9,392,071,196	8,478,773	231,925	63,355
13 Indiana.....	184,095	700	3,788	47,050	22,762	109,795	1,034,442	761,135,883	873,247	122,941	36,254
14 Iowa.....	259,017	—	6,008	30,285	98,078	124,641	807,787	477,828,202	649,526	53,638	104,623
15 Kansas.....	40,651	100	2,237	10,895	3,121	24,798	325,465	173,812,220	290,588	30,248	4,629
16 Kentucky.....	194,579	60	882	88,945	4,353	103,339	670,804	447,852,340	574,627	90,895	5,782
17 Louisiana.....	104,234	—	207	57,214	11,808	35,005	455,335	204,508,400	428,605	10,846	15,884
18 Maine.....	60,139	—	1,007	14,237	12,927	31,968	255,055	165,054,440	246,861	28,329	9,885
19 Maryland.....	268,369	6,023	100	121,212	5,156	183,876	1,796,507	1,414,721,120	1,770,869	6,567	19,071
20 Massachusetts.....	1,147,205	40	36,329	315,907	41,377	753,552	5,808,864	4,673,442,791	5,356,301	381,103	121,455
21 Michigan.....	380,397	1,300	13,280	65,345	97,219	208,243	1,472,737	1,127,005,479	1,224,724	163,861	84,152
22 Minnesota.....	146,195	100	4,299	29,461	26,127	86,208	1,075,852	752,851,693	979,004	54,656	42,192
23 Mississippi.....	23,585	9,031	750	2,777	2,719	8,305	81,834	36,716,805	74,041	4,752	8,011
24 Missouri.....	256,572	850	10,313	83,686	18,203	143,514	2,877,102	2,005,744,576	2,526,418	332,825	17,850
25 Nebraska.....	135,182	1,250	5,416	29,411	37,497	61,608	524,852	331,399,194	482,155	3,399	39,298
26 Nevada.....	3,121	—	—	979	1,000	1,142	26,030	4,873,900	21,934	2,412	1,634
27 New Hampshire.....	129,992	45,206	2,287	14,782	21,763	46,054	355,794	212,670,047	300,478	27,692	27,624
28 New Jersey.....	1,074,887	163,488	18,514	146,719	325,021	426,143	8,767,751	2,743,758,799	3,819,449	123,289	325,013
29 New York.....	5,060,906	28,743	84,924	1,293,177	161,175	3,502,887	20,917,726	20,741,646,599	19,857,722	775,763	234,241
30 North Carolina.....	40,789	—	918	5,094	12,246	22,531	129,747	46,451,800	110,956	6,381	12,410
31 Ohio.....	687,927	3,750	11,449	243,759	35,818	393,151	3,931,423	3,440,297,822	3,263,940	557,802	109,681
32 Oregon.....	23,262	—	1,480	5,307	1,516	14,959	174,955	67,658,000	150,442	17,179	7,334
33 Pennsylvania.....	1,113,908	436,500	85,306	50,329	70,960	520,903	7,870,562	8,790,299,591	7,316,059	315,175	239,323
34 Rhode Island.....	212,872	—	2,570	51,450	1,800	157,032	969,248	765,556,052	880,362	71,754	17,132
35 South Carolina.....	45,792	6,802	385	10,626	4,567	23,412	172,005	99,388,400	152,755	14,906	4,844
36 Tennessee.....	116,848	—	1,848	59,760	11,148	53,592	572,490	344,411,892	476,214	76,175	20,101
37 Texas.....	56,060	150	2,261	17,190	9,309	27,170	379,613	172,088,580	317,581	46,552	15,480
38 Vermont.....	13,950	175	613	2,675	4,760	5,727	71,015	35,886,400	65,250	684	5,081
39 Virginia.....	78,832	—	1,973	21,688	17,642	37,529	483,351	406,212,600	438,671	28,076	21,604
40 Washington.....	81,097	—	1,990	9,901	38,833	30,323	315,993	138,270,703	256,676	17,465	41,852
41 West Virginia.....	19,238	—	618	2,347	1,283	14,990	150,686	146,980,430	126,598	21,021	3,067
42 Wisconsin.....	263,896	—	6,301	31,732	39,419	133,444	1,396,535	1,192,222,406	1,202,019	148,524	45,992
43 All other states.....	49,326	—	2,458	8,808	7,633	30,427	232,723	112,808,405	205,096	17,259	10,508

AND TERRITORIES: 1900—Continued.

POWER.												ESTABLISHMENTS CLASSIFIED BY NUMBER OF EMPLOYEES.										
Owned.												Total number.	Under 5.	5 to 20.	21 to 50.	51 to 100.	101 to 250.	251 to 500.	501 to 1,000.	Over 1,000.		
Number reporting power.	Total horse-power.	Engines.				Water wheels.		Electric motors.		Other power.												
		Steam.		Gas or gasoline.		Number.	Horse-power.	Number.	Horse-power.	Number.	Horse-power.											
Number.	Horse-power.	Number.	Horse-power.	Number.	Horse-power.							Number.	Horse-power.	Number.	Horse-power.							
638	31,096	1,609	31,165	18	250	4	33	40	219	22	329	877	264	400	107	52	26	16	8	4	1	
10	124	12	109									11	2	6	3							2
2	21	2	21									3	2	1								3
6	107	8	107									7	7	6	2							4
24	1,199	49	1,081	4	42			1	8	2	65	41	19	16	2	3	1	1				5
2	225	11	225									5	1	3								6
18	801	49	751	1	10			1	5	3	35	21	5	8	3	4	1					7
8	76	7	76									4	8		1							8
2	405	12	405									8		1								9
11	168	14	168									11	5	3	3							10
9	307	24	307									9	2	7	1			2				11
46	3,471	119	3,250	2	35			6	94	1	92	63	11	23	8	7	3				1	12
30	654	52	649									39	14	10	3	2	1					13
17	379	28	369									26	8	12	3	2	1					14
16	154	20	139			1	15			1	10	17	4	12	1							15
12	343	19	343									17	8	12	1							16
2	139	8	139									3		2		1						17
7	511	15	511									11	7	7								18
10	469	28	469									9	1	5	1							19
50	4,217	150	4,212					1	5			68	16	28	7	7	5	1				20
26	502	43	498	1	4							38	9	21	11	1	1				1	21
10	838	28	832					2	6			11	4	4	1							22
5	58	6	55					1	3			5	2	2	1							23
14	1,298	58	1,298			1	5					25	10	11	2							24
5	1,063	13	1,063									9	3	4	1							25
												3	3									26
8	163	14	163									13	4	6	2	1						27
29	1,509	82	1,449	4	30			2	30			34	7	17	4	2	1				3	28
71	6,401	285	6,212	4	120	1	1	26	68			101	33	38	12	7	4	5	1	1	1	29
6	68	7	68									10	5	5								30
63	1,387	121	1,342	1	5							73	19	40	8	1	3				2	31
2	16	3	16									5	3	1	1							32
72	3,091	154	3,036							3	55	89	36	35	12	3	1	1				33
5	353	32	353									6	1	1	2	1						34
3	33	3	33									4		3								35
8	234	31	234									11	4	3	1	3						36
7	180	14	123	1	4					6	8	11	1	7	3							37
7	67	7	58							4	9	7	3	4								38
10	206	21	206									12	1	7	4							39
2	13	2	13									6	2		2							40
4	60	3	40									8	3	4								41
16	681	50	669			1	12					25	7	13	3	1						42
7	75	10	75									10	3	5	2							43

TABLE 10.—ESTABLISHMENTS OWNED AND OPERATED BY MUNICIPALITIES: 1900.

	United States.	Kentucky.	Massachusetts.	Michigan.	Minnesota.	Missouri.	Nebraska.	Ohio.	Virginia.	West Virginia.
Number of establishments	15	1	3	1	1	1	1	2	4	1
Capital:										
Total	\$1,784,592	\$10,000	\$223,924	\$15,470	\$162,775	\$5,600	\$3,250	\$268,082	\$775,491	\$240,000
Land	\$97,069	\$230	\$34,521	\$1,000	\$6,667	\$100	\$1,000	\$9,851	\$20,700	\$23,000
Buildings	\$160,709	\$1,785	\$31,958	\$2,000	\$4,166	\$500	\$1,000	\$23,000	\$31,800	\$15,000
Machinery and gas-making apparatus, holders, mains, meters, teams, tools, horses, wagons, and other accessories	\$1,393,648	\$37,125	\$133,008	\$12,000	\$120,588	\$5,000	\$1,000	\$231,441	\$673,491	\$180,000
Raw materials and finished products on hand, including by-products	\$6,805	\$460	\$5,816		\$179			\$350		
Cash on hand, surplus, reserve fund (invested or otherwise), bills and unsettled ledger accounts receivable, and sundries not included in any of the foregoing items	\$76,961	\$400	\$18,621	\$470	\$31,180		\$250	\$3,440		\$22,000
Salaried officials, clerks, etc.:										
Total number	51	1	7	1	2	1	1	7	17	14
Total salaries	\$35,710	\$912	\$2,279	\$500	\$1,500	\$780	\$500	\$6,365	\$17,784	\$5,090
Men:										
Number	50	1	6	1	2	1	1	7	17	14
Salaries	\$35,536	\$912	\$2,155	\$500	\$1,500	\$780	\$500	\$6,365	\$17,784	\$5,090
Women:										
Number	1		1							
Salaries	\$124		\$124							
Wage-earners (men, 16 years and over):										
Greatest number employed at any one time during the year	328	6	79	1	33	1	1	26	90	36
Least number employed at any one time during the year	184	5	12	1	13	1	1	13	40	48
Average number	174	6	18	1	18	1	1	18	50	61
Wages	\$107,007	\$2,748	\$4,424	\$600	\$1,528	\$360	\$420	\$10,428	\$51,407	\$32,032
Miscellaneous expenses:										
Total	\$60,182	\$3,821	\$6,491	\$583	\$9,923	\$305	\$1,650	\$4,868	\$23,400	\$9,141
Amount paid for rent of—										
Works	\$1,250						\$1,250			
Offices	\$1,045				\$335				\$710	
Amount paid for taxes, including royalties and special tax	\$11,816	\$481		\$40		\$156		\$439	\$10,650	
Amount paid for lamps and appliances purchased for sale	\$3,547		\$473	\$100	\$2,764		\$200	\$10		
Amount paid for insurance, ordinary repairs of buildings, machinery, tools, mains, lamps, and appliances, interest, freight, advertising, and all other sundry expenses	\$42,524	\$3,340	\$6,018	\$443	\$6,824	\$149	\$200	\$4,869	\$12,040	\$9,141
Materials used:										
Aggregate cost	\$148,262	\$7,460	\$15,619	\$1,190	\$9,925	\$1,152	\$1,310	\$23,724	\$67,701	\$20,091
For gas making:										
Total cost	\$128,677	\$7,424	\$6,619	\$950	\$8,700	\$912	\$1,175	\$22,048	\$62,526	\$18,268
Coal:										
Tons	40,254	2,802	1,997		655	730		4,524	14,805	14,741
Cost	\$81,074	\$6,662	\$5,299		\$3,367	\$912		\$11,713	\$35,432	\$17,689
Coke:										
Bushels	71,359							71,359		
Cost	\$2,952							\$2,952		
Oil:										
Gallons	1,138,053	12,700	17,251	20,000	144,187		19,583	284,121	621,836	18,375
Cost	\$44,404	\$762	\$1,303	\$900	\$5,393		\$1,175	\$7,203	\$27,094	\$574
Water:										
Gallons	18,185,557	500,000	92,700	500,000				1,200,000	7,142,857	8,750,000
Cost	\$247		\$17	\$30				\$180		
Fuel for boilers and retorts	\$5,482		\$803	\$240	\$376		\$110	\$1,367	\$1,820	\$266
Mill supplies	\$2,178	\$10	\$1,645		\$29	\$25	\$15	\$25	\$328	\$96
All other materials, including purification supplies	\$6,347	\$26	\$2,960		\$260	\$215	\$10	\$284	\$1,117	\$1,466
Amount of freight paid	\$5,583		\$3,583						\$2,000	
Products:										
Total value	\$501,027	\$15,046	\$46,070	\$6,060	\$34,526	\$6,706	\$3,975	\$58,638	\$235,969	\$94,037
Gas sold:										
Feet	481,952,120	12,715,100	26,543,000	1,848,390	25,310,000	4,126,000	1,825,000	74,685,620	230,376,160	107,577,850
Value	\$150,996	\$12,715	\$39,000	\$5,801	\$30,979	\$6,406	\$3,650	\$52,657	\$224,396	\$75,392
All other products, including by-products, coke, tar, etc., sold	\$45,312	\$2,331	\$7,060			\$300		\$5,971	\$11,573	\$18,077
Receipts from rents and sales of appliances	\$4,719		\$10	\$259	\$3,547		\$325	\$10		\$508
Power:										
Number of establishments reporting power	10	1	2		1			2	3	1
Number of engines (steam)	18	1	2		3			5	7	
Total horsepower	236	6	13		55			37	105	20
Establishments classified by number of employees:										
Total number	15	1	3	1	1	1	1	2	4	1
Under 5	5		1	1		1		1	1	
5 to 20	4	1	1					1	1	
21 to 50	4				1			1	2	
51 to 100	2		1							1

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MANUFACTURES.

LEAD, COPPER, AND ZINC SMELTING AND REFINING.

Hon. WILLIAM R. MERRIAM,

Director of the Census.

SIR: I transmit herewith, for publication in bulletin form, a report on the smelting and refining of lead, copper, and zinc, prepared under my direction by Mr. Charles Kirchhoff, of New York city, acting in the capacity of an expert special agent of the division of manufactures of the Census Office.

The schedules of inquiry were designed to elicit complete data relative to the smelting and refining of the metal from the ore, and not to include any items of capital, wages, expenses, materials, etc., pertaining to mining, except as the same may be represented in the cost of the ore or concentrated mineral at the smelter.

In previous censuses attempts to segregate the mining and metallurgical branches of these industries and to report separately the statistics pertaining to each did not meet with a full measure of success. At the census of 1870 the work of smelting the ores and refining the resultant base metals was treated as manufacturing, and the data obtained included in the report on the manufactures. The scope and method of the inquiry differed, however, in several important particulars from those employed at this census. At the censuses of 1880 and 1890 such a separation was not attempted except as incidental to the report on mining, and the results obtained are included in the reports on the mineral industries for those periods. Any comparison, therefore, that may be made of the statistics presented in this report with those for prior census periods will be of doubtful accuracy and value.

The statistics of the three branches of the industry, the smelting and refining of lead, copper, and zinc, are presented separately in the several tables under the respective designations, the totals being combined in the first table,

which presents a summary for the three branches of the industry.

The smelting and refining plants are generally located with particular reference to proximity of the ore mines, availability of cheap and advantageous fuels, facilities for refining the base metals, convenience to a ready market, etc.; and the natural division of the industry groups the establishments engaged in it into those located east and west of the Mississippi River, and this geographical division is shown in the statistics for each branch of the industry.

As explained in the text descriptive of the tables and industry, establishments engaged in lead smelting frequently report products of the precious metals, gold and silver, of greater value than the lead products, and this is true to a less extent in the copper smelting industry; in such cases, the fact that lead or copper ore is smelted is the sole factor considered in classifying the reports.

The report shows a capital of \$139,354,138 invested in the 117 establishments. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the corporations reporting. The value of products is returned at \$358,786,472, to produce which involved an outlay of \$2,150,018 for the salaries of officials, clerks, etc.; \$15,973,626 for wages paid; \$3,088,007 for miscellaneous expenses, including rent, taxes, etc.; and \$279,655,350 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the product is, in any sense, a measure of manufacturing profits in the industry during 1899. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of

the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

An analysis of these results and a comparison with the totals for other manufacturing industries will disclose the fact that the cost of materials for a stated value of product is much greater than is generally found in other manufacturing industries; also, that the number of wage-earners and wages paid are much smaller proportionately. This is generally true of all industries, including petroleum refining, in which the line of demarcation between the mining and manufacture is difficult to define in statistical treatment.

Notwithstanding the absence of data for former censuses, that can be used for purposes of comparison with the statistics presented in this report, it can be stated with certainty that the three branches of the industry have kept pace with the general growth of manufacturing industries. Especially is this the case in copper smelting and refining, which has made remarkable progress, due largely to the increased use of the metal in the electrical industry and the discovery of new sources of ore.

Very respectfully,



Chief Statistician for Manufactures.

LEAD, COPPER, AND ZINC SMELTING AND REFINING.

By CHARLES KIRCHHOFF, *Expert Special Agent.*

In the earlier stages of the development of our resources of the base and precious metals, particularly in the Rocky Mountain region, the absence of railroads and the high cost of transportation made local metallurgical treatment a necessity. The mining of ores and the subsequent working of them were frequently carried on by the same individual, firm, or corporation, and it was difficult to ascertain the amount of capital invested in each, or make a division of the aggregate labor of the establishment between the two processes, or estimate the value of the ore when charged into the smelter. These difficulties appear to have resulted in combining the statistics for mining, and the milling and smelting and refining of ores at all prior censuses except that for 1870. At the census of 1870 a separation was made of the mining and manufacturing, and the treatment of the ores after their delivery from the mines was classed as manufacturing. The statistics for the two branches of the industry are again separated at the census of 1900, and those for the smelting of ores and the refining and separation of the metals are included in the report on the manufactures. The statistics for mines, mining, and ore dressing will be presented in subsequent reports, to be published in conformity with section 8 of the Act of Congress of March 3, 1899, providing for taking the Twelfth and subsequent censuses.

The crushing and milling of quartz, the separation of gold and silver from the ore in concentrating and separating plants operated either under the cyanide process or other methods are so closely allied with the mining industry that the statistics will constitute a part of the report on mines and mining, and will not be included in the report on manufactures. With the exception of the extraction of iron from iron ore in blast furnaces, which will be treated in the special report on iron and steel, the statistics presented herewith include all the data collected by the Twelfth Census regarding the smelting of ores and refining of the crude metals or metal alloys obtained in smelting.

Copper and lead ores frequently contain paying quantities of gold and silver, and a large tonnage of the "dry ores" of gold and silver free from base metals is smelted with the lead and copper ores to facilitate the extraction of the metals. In these cases the base metals are merely the carriers for the precious metals. The reports for a number of the smelters and refiners show that the value of the precious metals exceeded the value of the base metals, while other reports show that the smelting of lead is only incidental to the extraction of the precious metals and the subsequent parting operation. If the principle were followed of classifying schedules according to the product of

chief value, a number of those included in this report would be classified as refineries of gold and silver. This report, however, includes the returns from all establishments in which copper or lead ore was smelted or refined, irrespective of the value of these baser metals as compared with the value of the other products of the establishment. From the reports of the copper and lead smelters and refiners presented herewith, it appears that they produced 83,650,828 fine ounces of silver and 2,739,188 fine ounces of gold during the calendar year 1899. According to the report of the Director of the Mint, there were 54,764,500 ounces of silver and 3,437,210 ounces of gold produced during the calendar year 1899, but this does not include the product of the foreign ores and furnace materials treated in bond, and, on the other hand, the gold reported by the smelters does not include the products of placer mining or products that do not pass through the smelter but which are included in the report of the Director of the Mint. Thus the amounts reported by the Director of the Mint are not comparable with those shown in this report.

Smelting and refining being reported as an adjunct to the mining industry at the census of 1890, no attempt was made to secure data which would be in harmony with the returns obtained for manufacturing industries, and it is therefore impossible to present comparable statistics for all the items reported for 1900.

If the three branches of the industry are ranked according to the value of their products, including the precious metals, lead stands first, copper second, and zinc third. The reports for each industry relate to the calendar year 1899, although in isolated instances the returns from individual producers were given for their fiscal years.

Table 1 is a consolidated summary of the totals for the 3 industries, lead, copper, and zinc smelting and refining.

TABLE 1.—SUMMARY FOR THE UNITED STATES OF THE LEAD, COPPER, AND ZINC SMELTING INDUSTRIES.

	Total.	Lead.	Copper.	Zinc.
Number of establishments.....	117	89	47	81
Capital.....	\$189,854,188	\$72,148,993	\$53,063,395	\$14,141,810
Land.....	\$3,039,843	\$3,704,532	\$2,091,415	\$2,243,876
Buildings.....	\$43,116,399	\$21,974,850	\$15,670,959	\$5,470,590
Machinery, tools, and implements.....	\$34,187,168	\$26,480,025	\$5,771,389	\$1,935,754
Cash and sundries.....	\$54,010,728	\$19,939,506	\$29,529,682	\$4,491,590
Salaried officials, clerks, etc., number.....	1,121	425	488	208
Salaries.....	\$2,150,018	\$754,913	\$954,905	\$440,200
Wage-earners, average number.....	24,512	8,819	11,324	4,869
Total wages.....	\$15,978,626	\$5,083,694	\$8,529,021	\$2,365,921
Miscellaneous expenses.....	\$3,083,007	\$1,166,210	\$1,522,325	\$399,472
Cost of materials used.....	\$279,655,350	\$144,195,163	\$122,174,129	\$13,286,058
Value of products.....	\$358,786,472	\$176,466,304	\$165,131,670	\$18,188,498

LEAD SMELTING AND REFINING.

Table 2 shows the totals for the establishments reported at the Twelfth Census as engaged in the smelting and refining of lead.

TABLE 2.—LEAD SMELTING AND REFINING: SUMMARY FOR THE UNITED STATES.

	United States.	Colorado.	Missouri.	Montana.	All other states and territories. ¹
Number of establishments.....	39	8	11	3	17
Capital.....	\$72,148,933	\$22,569,715	\$944,589	\$2,858,158	\$45,776,521
Land.....	\$3,704,552	\$1,057,264	\$107,000	\$63,334	\$2,476,954
Buildings.....	\$21,974,850	\$7,064,040	\$269,550	\$939,953	\$13,701,307
Machinery, tools, and implements.....	\$26,480,025	\$8,752,414	\$61,128	\$1,191,663	\$16,474,820
Cash and sundries.....	\$19,989,506	\$5,695,997	\$606,861	\$668,208	\$13,123,440
Salaried officials, clerks, etc., number.....	425	137	35	27	228
Salaries.....	\$764,913	\$288,119	\$47,360	\$73,818	\$345,616
Wage-earners, average number.....	8,319	3,316	474	563	3,966
Total wages.....	\$5,058,684	\$2,390,383	\$255,590	\$397,771	\$2,044,940
Miscellaneous expenses.....	\$1,166,210	\$154,001	\$41,565	\$47,620	\$923,018
Cost of materials used ²	\$144,195,163	\$83,996,975	\$3,317,553	\$4,895,771	\$102,044,859
Value of products ²	\$176,466,304	\$40,732,271	\$3,852,485	\$5,264,253	\$125,617,345

¹ Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

² The difference between the cost of materials and value of product, as shown in Table 1, and as shown in Table 2, is caused by the duplication in the latter table of the intermediate product between the ore and the refined metal, amounting to \$25,503,203 in the United States, \$9,204,735 in Colorado, and \$16,803,468 in all other states.

In addition to the 39 active establishments shown in Table 2, there were 3 idle establishments with a capital of \$629,871, 1 located in Missouri, 1 in Nevada, and 1 in Utah.

The primary object of the statistics for the industry, as compiled at the census of 1890 and published in the Report on Mineral Industries, was to show the total quantity of lead produced. They do not show the number of estab-

lishments or capital engaged in the industry or the total value of the products; and the statistics concerning employees, salaries, wages, and expenses were not compiled in conformity with the methods followed in compiling the statistics for manufactures, and therefore can not be used for purposes of comparison. Table 3 shows the totals for the lead smelting and refining works as reported at the census of 1890.

TABLE 3.—LEAD SMELTING AND REFINING: 1890.¹

Expenditures, total.....	\$11,457,367	Average days employed:	
Wages.....	\$4,228,634	Foremen.....	337
Salaries.....	\$519,716	Mechanics.....	322
Supplies and materials.....	\$5,154,632	Laborers.....	367
Rent, insurance, taxes, etc.....	\$1,489,715	Boys.....	336
Contractors.....	\$78,620	Products:	
Number of employees:		Refined lead (short tons).....	182,967
Office force.....	249	Fine copper in matte (pounds).....	4,195,929
Foremen.....	173	Stock:	
Mechanics.....	354	Base bullion (short tons), January 1, 1889.....	1,474
Laborers.....	5,595	Base bullion (short tons), January 1, 1890.....	4,730
Boys.....	9	Refined lead (short tons), January 1, 1889.....	12,053
Average daily wages:		Refined lead (short tons), January 1, 1890.....	9,230
Foremen.....	\$3.98		
Mechanics.....	\$2.98		
Laborers.....	\$2.15		
Boys.....	\$0.50		

¹ Mineral Industries in the United States, Eleventh Census, Lead and Zinc, page 172.

The industry has made great progress during the past decade, and the methods of manufacture and management have changed so materially that the quantity of the product is the most reliable indication of the extent of the increase. The lead product for 1889 amounted to 182,967 short tons of refined lead as compared with 293,965 short tons in 1899, an increase of 110,998 short tons, or 60.7 per cent.

On account of the different methods of treating the smelting industry prior to 1889, census figures which are comparable with those of 1899 are not available for these earlier years. Statistics of lead production, based on returns from the smelters of the country, have, however, been compiled by the Geological Survey since 1873, and a condensation of these statistics is presented in Table 4.

TABLE 4.—PRODUCTION OF REFINED LEAD IN THE UNITED STATES FROM 1873 TO 1899.

YEAR.	Total production.	Desilverized lead.	Soft lead.
	<i>Short tons.</i>	<i>Short tons.</i>	<i>Short tons.</i>
1873.....	42,540	20,159	22,381
1874.....	52,080		
1875.....	59,640	34,909	24,731
1876.....	64,070	37,649	26,421
1877.....	81,900	50,748	31,152
1878.....	91,000	64,290	26,770
1879.....	92,780	64,650	28,130
1880.....	97,825	70,135	27,690
1881.....	117,085	86,315	30,770
1882.....	132,890	108,875	29,015
1883.....	143,957	122,157	21,800
1884.....	139,897	119,965	19,932
1885.....	129,412	107,437	21,975
1886.....	135,629	114,829	20,800
1887.....	160,700	135,552	25,148
1888.....	180,555	151,465	29,090
1889.....	182,967	159,709	29,258
1890.....	161,754	130,408	31,346
1891.....	202,406	171,009	31,397
1892.....	213,262	181,594	31,678
1893.....	229,333	196,820	32,513
1894.....	219,090	181,404	37,686
1895.....	241,882	201,992	39,890
1896.....	264,994	221,457	43,537
1897.....	291,036	247,483	43,553
1898.....	310,621	267,842	42,779
1899.....	304,392	263,826	40,566

Table 5 shows the total production of lead in each state and territory for the year 1899 as reported by the 39 establishments included in this report.

TABLE 5.—PRODUCTION OF REFINED LEAD IN 1899, BY STATES AND TERRITORIES, IN SHORT TONS.

STATES AND TERRITORIES.	Total.	Soft lead.	Hard or antimonial lead.	All other lead (including Doré bars).
United States.....	293,965	45,237	8,393	240,335
California.....	8,945		596	8,349
Colorado.....	22,064		702	21,362
Idaho.....				
Illinois.....	85,897	71	941	84,885
Iowa.....	400	400		
Kansas.....	41,959	398	1,828	40,233
Missouri.....	41,976	41,976		
Montana.....				
Nebraska.....	59,381	2,119	2,624	54,638
New Jersey.....	80,856	113	2,202	78,541
New Mexico.....				
Texas.....				
Utah.....				
Virginia.....	160	160		
Washington.....	2,327			2,327

The total production, 293,965 short tons, for 1899, shown in Table 5, is 10,427 short tons less than the total shown

in Table 4. This difference is due principally to the fact that in the returns of the United States Geological Survey the product of by far the greatest smelting interest, the American Smelting and Refining Company, is that of the calendar year, while the statistics for the Census Office, for the majority of the constituent plants, cover the fiscal year of that consolidation. The fiscal year was accepted because it was the first which had elapsed since the organization of the American Smelting and Refining Company. Moreover, a considerable tonnage of soft lead, which in the reports of the Survey is usually included with desilverized lead, since it is thus marketed, was for the census report segregated by two lead smelting and desilverizing plants.

The production of lead for the year 1899 was the largest in the history of the industry with the exception of that of the previous year, 1898. A large expenditure is necessary to the establishment of a fully equipped plant for the smelting and refining of ores, and this, combined with the location and character of the raw materials, has resulted in confining the industry to a few large establishments. Of the 39 establishments reported, 15 are owned by one company, which thus controls a large percentage of the product.

As shown by Table 4, there has been an almost constant increase in the quantity of lead produced, and while statistics showing the increase in capital, employees, or wages are not available, Table 2 shows that the industry had an invested capital of \$72,148,933 in 1899, gave employment to 8,319 wage-earners, paid \$5,088,684 in wages, while its products were valued at \$175,466,304. The practice of using lead as the carrier for the precious metals, and thus extracting them more cheaply than by the older methods, largely increased the quantity of the precious metal products. The value of the gold and silver included in the \$175,466,304 shown as products in Table 2, amounted to \$130,205,375, or 74.2 per cent of the total. In this connection, it should be stated that the foregoing value is that of both smelted and refined gold and silver. The value of fine gold and silver included in the total value of products in Table 2 is \$94,153,824; the difference, \$36,051,551, is the value of gold and silver in base bullion of smelters in which refining and desilverizing is not a part of the process.

Table 6 presents the statistics for the establishments located east and west of the Mississippi, respectively.

TABLE 6.—LEAD SMELTING AND REFINING: ESTABLISHMENTS BY LOCATION EAST AND WEST OF THE MISSISSIPPI RIVER.

	United States.	East of the Mississippi.	West of the Mississippi.
Number of establishments	39	5	34
Capital	\$72,143,933	\$3,975,079	\$63,173,854
Salaries officials, clerks, etc., number	425	26	399
Salaries	\$754,913	\$69,502	\$685,411
Wage-earners, average number	8,319	715	7,604
Total wages	\$5,083,684	\$453,787	\$4,634,897
Miscellaneous expenses	\$1,165,210	\$87,660	\$1,073,550
Materials used, aggregate cost	\$109,703,366	\$32,963,166	\$136,740,200
Smelting, total cost	\$60,868,480	\$1,208,568	\$59,659,912
Domestic ore, tons	1,067,545	454	1,067,091
Cost	\$58,532,321	\$15,520	\$58,516,801
Foreign ore, tons	284,914	12,921	271,993
Cost	\$7,336,159	\$1,193,048	\$6,143,111
Refining, total cost	\$100,302,504	\$30,688,133	\$70,114,371
Domestic base bullion, tons	180,995	45,000	135,995
Cost	\$80,940,771	\$12,006,867	\$68,933,904
Foreign base bullion, tons	78,989	78,810	2,179
Cost	\$19,361,733	\$18,681,266	\$1,180,467
All other materials, including fuel, freight, mill supplies, etc., cost	\$3,032,382	\$1,066,465	\$6,965,817
Products, aggregate value	\$200,974,507	\$38,992,943	\$161,981,564
Smelting, total value	\$31,142,773	\$1,507,583	\$29,635,190
Non-argentiferous ores, total value	\$4,114,333	\$29,010	\$4,084,726
Soft lead, pounds	90,478,285	683,708	89,794,583
Value	\$3,801,242	\$29,010	\$3,771,632
Lead oxide, pounds	10,329,804		10,329,804
Value	\$299,201		\$299,201
Argentiferous ores, total value	\$77,028,437	\$1,477,973	\$75,550,464
Lead contents of base bullion, pounds	402,324,603	1,623,330	400,801,273
Value	\$15,546,661	\$67,024	\$15,479,637
Silver, fine ounces	52,641,752	2,043,033	50,598,719
Value	\$31,185,203	\$1,217,369	\$29,967,834
Gold, fine ounces	1,322,177	8,825	1,313,352
Value	\$26,528,171	\$178,580	\$26,349,591
Copper contents of matte, pounds	26,964,031	150,000	26,814,031
Value	\$9,768,402	\$25,000	\$9,743,402
Refining and desilverizing, total value	\$116,527,046	\$35,583,270	\$79,943,776
Hard or antimonial lead, pounds	16,785,097	6,286,000	10,499,097
Value	\$701,082	\$202,912	\$498,170
All other lead (including Doré bars), pounds	480,670,814	226,862,000	253,813,831
Value	\$20,672,140	\$9,668,061	\$11,004,179
Doré bars, contents of precious metals, total value	\$94,153,824	\$25,612,397	\$68,541,427
Silver, fine ounces	70,420,917	31,019,725	39,401,192
Value	\$42,143,703	\$18,908,707	\$23,234,996
Gold, fine ounces	2,514,883	325,141	2,189,695
Value	\$32,010,121	\$6,703,690	\$25,306,431
All other products, value	\$4,318,581	\$1,943,030	\$2,375,491

From Table 6 it appears that 34 of the 39 establishments are located west of the Mississippi. The total capitalization of these establishments was \$63,173,854, or 87.6 per cent of the total for the industry. They gave employment to 7,604 wage-earners, or 91.4 per cent of the total, and their yearly wages amounted to \$4,634,897, or 91.1 per cent of the total. Their products were valued at \$161,981,564, or 80.6 per cent of the total value of all products. The establishments located in the Western states were engaged largely in the smelting of ores, as indicated by the fact that the cost of the ores consumed by them was \$59,659,912, being 98 per cent of the total cost of all ores.

The object of the inquiry of the Twelfth Census regarding the smelting and refining of lead was to obtain from each establishment such information as would make it possible to present separately the statistics for both branches of the industry when carried on either in the same or in separate plants. Under these conditions it was necessary to ascertain the quantities and values of the materials and products of the smelters and refineries respectively. In 8 establishments both processes were carried on. Two of these establishments produced 4,463,312 pounds of soft lead, valued at \$176,574, from non-argentiferous ore. Besides this, there were 119,019,138 pounds of lead, valued at \$4,952,228; 19,570,396 ounces fine of silver, valued at \$11,483,315; 646,142 ounces fine of gold, valued at

\$13,120,675; and 6,496,137 pounds of copper contents of matte, valued at \$983,392, reported as the products of the smelting plants of these 8 establishments (or an aggregate product of \$30,589,610 from smelting argentiferous ores). Of these products, 90,412,486 pounds of lead, 16,784,853 ounces fine of silver, and 580,178 ounces fine of gold, the aggregate value of which amounted to \$25,508,203, were again charged as materials for the refinery, and ultimately appear in the finished products of the establishments.

As practically the entire product of the smelters, with the exception of those smelting non-argentiferous ore, ultimately reaches the refinery as its raw material, the extent of duplication in the aggregate cost of materials and products for all establishments engaged in both branches of the industry is much greater than is indicated by these figures. It is, however, only when materials and products are twice included in the report for the same establishment that they are considered as duplicated in the statistics presented in this report. While it is necessary to include this duplication of quantities and values in statistics showing the totals for the different materials and products of the smelters and refiners respectively, they have been eliminated from Table 2, in which the original cost of materials and final value of products only are presented for the entire industry.

Of the 39 establishments reported, 30 were engaged in smelting only, 1 in refining and desilverizing, and 8

in both branches of the industry. Of the 38 smelters, 37 reported the consumption of domestic ore amounting to 1,667,545 short tons, valued at \$53,532,321, and 9 the consumption of 284,914 short tons of foreign ore, valued at \$7,336,159. The 9 refiners and desilverizers reported the consumption of 180,998 tons of base bullion from domestic smelters, valued at \$80,940,771, and 5 the consumption of 78,939 tons of foreign base bullion, valued at \$19,861,733.

Table 7 shows the quantities of domestic and foreign ores, and of base bullion, respectively, consumed by smelters and refineries in each of the states and territories in which the industry appeared in 1899.

TABLE 7.—QUANTITIES OF ORE SMELTED AND BASE BULLION REFINED AND DESILVERIZED.

STATES AND TERRITORIES.	SMELTERS.		REFINERS AND DESILVERIZERS.	
	Domestic ore.	Foreign ore.	Domestic base bullion.	Foreign base bullion.
United States	<i>Short tons.</i> 1,667,545	<i>Short tons.</i> 284,914	<i>Short tons.</i> 180,998	<i>Short tons.</i> 78,939
California	84,860	5,600	10,462	
Colorado	1,050,357	982	25,794	
Idaho	3,402			
Illinois	90		36,572	2,467
Iowa	400			
Kansas	19,278		46,767	660
Missouri	68,719			
Montana	145,304	3,750		
Nebraska	32,211	3,726	52,096	
New Jersey	149	12,921	8,428	74,313
New Mexico	15,122			
Texas	84,295	252,887		
Utah	171,034			
Virginia	225			
Washington	41,499	5,098	879	1,469

As shown by Table 7, 284,914 tons, or but 14.6 per cent of the total quantity of ores consumed in smelters, were imported, while of the 259,937 tons of base bullion credited to refineries and desilverizers, 78,939 tons, or 30.4 per cent, were imported, a difference to be accounted for by the fact that considerable quantities of foreign ore are smelted before being sent into the country, only the refining and desilverizing being done here, almost entirely in bond. Of the total quantity (284,914 tons) of foreign ores consumed in smelters, 252,887 tons, or 88.8 per cent, were consumed in Texas. A large part of this ore is imported from Mexico and smelted near the border. Of the 78,939 tons of foreign base bullion consumed in the refineries and desilverizers, 74,313 tons, or 94.1 per cent, were reported by the refineries of the state of New Jersey. How little of this

foreign lead remains in the United States is shown by Table 13, 148,300,164 pounds of foreign lead, valued at \$5,517,569, being desilverized and refined in bond and reexported.

Table 8 gives the quantities and value of the different classes of products and the number of establishments reporting each class.

TABLE 8.—QUANTITIES AND VALUE OF PRODUCTS AND NUMBER OF ESTABLISHMENTS REPORTING EACH CLASS.

CLASS.	Number of establishments reporting.	Unit of measure.	Quantities.	Values.
Smelting non-argentiferous ores:				
Soft lead	17	Pounds	80,473,286	\$3,801,242
Lead oxide	8	Pounds	10,329,301	299,201
Smelting argentiferous ores:				
Lead contents of base bullion	23	Pounds	402,324,305	15,546,651
Silver	23	Oz. fine	52,641,752	31,185,203
Gold	22	Oz. fine	1,322,177	26,528,171
Copper contents of matte	19	Pounds	26,964,331	3,768,402
Refining and desilverizing:				
Hard or antimonial lead	8	Pounds	16,785,697	701,092
All other lead (including Doré bars)	9	Pounds	480,670,834	20,672,140
Doré bars—contents of silver	9	Oz. fine	70,420,917	42,143,703
Doré bars—contents of gold	9	Oz. fine	2,514,836	52,010,121

The quantities and values shown in Table 8 are the totals for smelting and refining, respectively, and include the duplications that arise when both branches of the industry are carried on by the same establishment.

There were 15 establishments engaged in smelting non-argentiferous ores only, 21 in smelting argentiferous only, and 2 in smelting both varieties of ores. Table 8 shows that all the 17 establishments using non-argentiferous ores were engaged in the production of soft lead, the total quantity produced being 90,473,286 pounds valued at \$3,801,242. Three establishments produced 10,329,304 pounds of lead oxide valued at \$299,201.

Silver is the product of greatest value for the establishments smelting argentiferous ores; 23 establishments reported 52,641,752 ounces valued at \$31,185,203, while 22 establishments reported 1,322,177 ounces of gold valued at \$26,528,171. Gold is the product of chief value for the refineries, 9 establishments reporting 2,514,836 ounces valued at \$52,010,121 as compared with 70,420,917 ounces of silver valued at \$42,143,703. The total lead product of the refineries was valued at \$21,373,222, while the product of gold and silver was valued at \$94,153,824.

Table 9 shows the quantities of the different varieties of products for each of the states and territories in which the industry appeared in 1899.

TABLE 9.—QUANTITIES OF PRODUCTS, BY STATES.

STATES AND TERRITORIES.	SMELTING.						REFINING AND DESILVERIZING.			
	Non-argentiferous ores.		Argentiferous ores.				Hard or antimonial lead.	All other lead (including Doré bars).	Doré bars, contents of precious metals.	
	Soft lead.	Lead oxide.	Lead contents of base bullion.	Silver.	Gold.	Copper contents of matte.			Silver.	Gold.
	Pounds.	Pounds.	Pounds.	Oz. fine.	Oz. fine.	Pounds.	Pounds.	Pounds.	Oz. fine.	Oz. fine.
United States	90,473,286	10,329,804	402,324,605	52,841,752	1,322,177	26,984,031	16,785,007	480,670,834	70,420,917	2,514,836
California			10,960,000	2,339,000	98,640	569,000	1,192,666	16,697,384	6,995,000	1,119,940
Colorado			219,804,385	24,464,621	760,240	9,269,744	1,402,948	42,723,944	5,769,336	234,763
Idaho			1,315,178	109,248	174					
Illinois	141,025						1,882,000	69,770,000	9,214,029	137,048
Iowa	800,646									
Kansas	795,793		21,842,788	2,208,295	88,622	1,629,706	2,654,608	80,466,519	11,078,966	418,571
Missouri	88,952,833	10,329,804								
Montana			40,853,057	4,356,099	54,415	791,162				
Nebraska	4,237,812		7,463,762	3,997,860	175,459	3,421,248	5,248,875	109,275,639	14,352,804	402,127
New Jersey	226,000		1,523,330	2,043,033	8,825	150,000	4,404,000	157,082,000	22,405,696	188,093
New Mexico			3,718,281	128,823		8,588				
Texas			26,476,178	6,790,207	40,937	4,676,641				
Utah			51,053,518	4,982,919	42,112	6,014,360				
Virginia	819,678									
Washington			17,819,188	1,222,147	52,753	438,582		4,655,407	605,086	14,294

The most important fact indicated by this table is the geographical distribution of the two branches of the industry. This distribution in each case has but slight relation to the location of the mines producing the ores used, but the relation is least apparent in the case of the refineries and desilverizers. The location of lead smelters is largely decided by the abundance of "dry ores" of the precious metals—ores which are free from lead—and by the abundance of fuel. These "dry ores" can be reduced more economically in lead smelters than is possible by amalgamation or other processes used for the extraction of gold and silver. There are a few relatively unimportant smelting plants in Idaho, Montana, New Mexico, and California, built to reduce the lead ores locally mined. The great mass of lead ore, however, is hauled, often great distances, to meet the fuel and to encounter "dry ores" of gold and silver. The principal large plants are in Colorado, Utah, and Montana. An excellent illustration of this movement is afforded by the famous Coeur d'Alene district in Idaho, which yields approximately one-quarter of the lead mined in the United States. Not a pound of the ore of this district is smelted locally, the concentrates and ore being shipped for reduction to the smelters in Colorado, Montana, Utah, Nebraska, Illinois, and on Puget Sound. Thus the smelters of Colorado produced 219,804,385 pounds of lead, or 54.5 per cent of the lead produced from argentiferous ores in all the smelters of the country, 24,464,621 fine ounces of silver, and 760,240 fine

ounces of gold, or 46.5 per cent, and 57.5 per cent, respectively, of the gold and silver product of all smelters. This preeminence is partly due to the large production of lead ores in Colorado, amounting to nearly one-third of the country's production in 1899,¹ but partly also to the large production of "dry ores" of gold and silver, and the production of coking coal, which latter, as explained above, combine to attract to this state lead ores mined in other parts of the country. The smelting of non-argentiferous or soft lead ores is very largely carried on in the state of Missouri, which is also the center of the region where these ores are chiefly mined. Of the entire production of soft lead, 88,952,833 pounds, or 92.8 per cent, came from the smelters of Missouri. In this state was also manufactured the entire product of lead oxide herein reported.

The distribution of refineries and desilverizers is very different from that of the smelters. While the smelting of argentiferous ores is centered largely in Colorado, Utah, and Montana, the refining and desilverizing is carried on more largely in New Jersey, Nebraska, and Kansas.

In Table 10 the statistics for the 30 establishments engaged in smelting exclusively, and those for the 1 engaged in refining, combined with the 8 establishments engaged in both branches of the industry, are separately given.

¹ Annual Report United States Geological Survey, Part VI. Mineral Resources of the United States, 1899, Metallic Products, Production of Lead in 1899, page 229.

TABLE 10.—ESTABLISHMENTS CLASSIFIED ACCORDING TO CHARACTER OF WORK DONE.

	Total.	Smelting only.	Smelting and refining.
Number of establishments	89	80	9
Capital	\$72, 148, 988	\$21, 796, 609	\$50, 852, 824
Saluried officials, clerks, etc., number	425	225	200
Salaries	\$754, 913	\$427, 000	\$327, 913
Wage-earners, average number	8, 319	5, 685	2, 684
Total wages	\$5, 088, 684	\$3, 209, 779	\$1, 878, 905
Miscellaneous expenses	\$1, 166, 210	\$730, 773	\$435, 437
Materials used, aggregate cost	\$160, 703, 866	\$42, 875, 982	\$126, 827, 884
Smelting, total cost	\$60, 868, 480	\$38, 738, 064	\$22, 180, 416
Domestic ore:			
Tons	1, 667, 545	1, 237, 002	430, 543
Cost	\$53, 532, 321	\$34, 500, 790	\$19, 031, 531
Foreign ore:			
Tons	284, 914	259, 083	25, 851
Cost	\$7, 336, 159	\$1, 237, 274	\$3, 095, 885
Refining, total cost	\$100, 802, 504		\$100, 802, 504
Domestic base bullion:			
Tons	180, 998		180, 998
Cost	\$80, 940, 771		\$80, 940, 771
Foreign base bullion:			
Tons	78, 939		78, 939
Cost	\$19, 861, 733		\$19, 861, 733
All other materials	\$8, 082, 882	\$4, 137, 918	\$3, 894, 464
Products, aggregate value	\$200, 974, 607	\$50, 696, 417	\$150, 278, 090
Smelting, total value	\$31, 142, 773	\$50, 426, 539	\$30, 716, 184
Non-argentiferous ores, total value	\$4, 114, 336	\$3, 937, 762	\$176, 574
Soft lead:			
Pounds	90, 473, 286	86, 009, 974	4, 463, 312
Value	\$3, 801, 242	\$3, 624, 668	\$176, 574
Lead oxide:			
Pounds	10, 329, 804	10, 329, 804	
Value	\$299, 201	\$299, 201	
Argentiferous ores, total value	\$77, 028, 437	\$46, 488, 827	\$30, 539, 610
Lead contents of base bullion:			
Pounds	402, 324, 605	288, 305, 467	119, 019, 138
Value	\$15, 546, 861	\$10, 594, 433	\$4, 952, 228
Silver:			
Fine ounces	52, 041, 752	33, 071, 356	19, 570, 896
Value	\$31, 185, 203	\$19, 701, 838	\$11, 483, 315
Gold:			
Fine ounces	1, 322, 177	676, 035	646, 142
Value	\$26, 528, 171	\$13, 407, 496	\$13, 120, 675
Copper contents of matte:			
Pounds	26, 964, 031	20, 467, 804	6, 496, 137
Value	\$3, 768, 402	\$2, 785, 010	\$983, 392
Refining and desilverizing, total value	\$115, 527, 046		\$115, 527, 046
Hard or antimonial lead:			
Pounds	16, 785, 097		16, 785, 097
Value	\$701, 082		\$701, 082
All other lead, including Doré bars:			
Pounds	480, 670, 834		480, 670, 834
Value	\$20, 672, 140		\$20, 672, 140
Doré bars, contents of precious metals:			
Total value	\$94, 153, 824		\$94, 153, 824
Silver:			
Fine ounces	70, 420, 917		70, 420, 917
Value	\$42, 143, 703		\$42, 143, 703
Gold:			
Fine ounces	2, 514, 836		2, 514, 836
Value	\$52, 010, 121		\$52, 010, 121
All other products, value	\$4, 318, 581	\$283, 721	\$1, 034, 860

The materials and products shown in Table 10 include the value of the intermediate products made and consumed in the same establishments. Therefore the total cost of materials and value of products do not agree with the totals given in Table 2.

In the census of 1890 certain groups of smelters were segregated in order to furnish some data bearing upon the characteristics of smelting in different districts. Conspicuous among these were the Colorado smelters, all of which purchase lead ores in the open market and smelt them with "dry ores." The smelters of the state were divided into two groups, those of the Leadville district and those of the Valley, the latter including the two great smelting centers, Pueblo and Denver. At that time only one of the works possessed a desilverizing plant also and was excluded on that account. In the census year 1899 there were 2 smelting concerns which were engaged in desilverizing also, and therefore could not be included.

Consequently, identical plants do not figure in the comparison given in Table 11, and during the decade which has elapsed some changes have occurred in the relative importance of the works. But on one or two points numerical expression is given to the progress made in the ten years.

TABLE 11.—STATISTICS OF COLORADO SMELTERS.

[Exclusive of works with desilverizing plants.]

	1889	1899
Total expenses	\$4, 014, 415	\$3, 526, 701
Wages	\$1, 570, 820	\$1, 714, 836
Salaries	\$191, 607	\$182, 412
Supplies and materials, not including ore	\$1, 717, 351	\$1, 540, 381
Taxes, rent, insurance, and all other expenditures	\$508, 639	\$89, 072
Paid contractors	\$30, 998	
Ore treated, short tons	589, 014	711, 371
Product of lead, short tons	1 66, 706	2 73, 363

1 Base bullion.

2 Lead contents of base bullion.

It is obvious that the subdivision of general expenses was different at the two periods, so that no deductions can be drawn from the data other than those of wages and salaries. The figures show a reduction in labor cost from \$2.67 per short ton of ore smelted in the year 1889 to \$2.41 per short ton in the year 1899. The cost of salaries per ton of ore smelted is also lower. However, it should not be inferred that the rates of wages and salaries have decreased in the industry.

In the report for the year 1889 attention was called to the small quantity of lead in the furnace mixture, that being a notable achievement of American metallurgical practice. It was not possible then to determine exactly the yield of lead from the ores treated, because the returns gave only the crude base bullion product, inclusive of silver contents. It was estimated that the average yield of lead from the mixtures was between 11 and 11.5 per cent. The reports of the smelters in the year 1899 show the actual lead contents of the base bullion produced in smelting, so that it is possible to state that the yield of lead from the ores treated averaged 10.3 per cent for the whole group of Colorado smelters included in Table 11. The statistics do not reflect the progress that has been made in the direction of the reduction of losses of the base and precious metals in smelting by making cleaner slags and by more effective recovery of flue dust.

The conditions surrounding the smelting of the non-argentiferous ores mined in Missouri, Kansas, Iowa, and Wisconsin are entirely different. Since only a very small number of smelters of this group are located in other states, the statistics of the works in Missouri may be selected as typical. All of them smelt high-grade lead concentrates with no admixture whatever of ores drawn from other sources. All the important producers whose returns entered into the statistics of 1889 are included in the list for the year 1899.

TABLE 12.—STATISTICS OF MISSOURI SMELTERS.

	1889	1899
Total expenses.....	\$580,210	\$530,698
Wages.....	\$206,541	\$255,590
Salaries.....	\$19,680	\$47,860
Paid contractors.....	\$3,182	\$25,382
Supplies and materials, not including ore.....	\$184,175	\$160,796
Rent, taxes, insurance, and all other expenditures.....	\$166,692	\$41,565
Quantity of ore treated, short tons.....	49,816	68,719
Lead produced, short tons.....	29,238	41,976
Oxide produced, short tons.....	1,250	5,165

¹ Includes the data for Illinois, Kansas, Missouri, and Wisconsin.

The labor cost per ton of ore treated, as indicated by the foregoing table, has declined from \$4.15 in 1889 to \$3.72 in 1899.

The detailed statistics for the smelting and refining industry, as reported at the census of 1900, are shown in Table 13. This table presents separate totals for each state in which there were 3 or more establishments, and groups the statistics for other states so as not to disclose the operations of individual establishments. The establishments are classified according to the character of the ownership, which shows that 5 were owned by individuals, 1 by a partnership, and 33 by corporations. The employees are segregated so as to show for salaried officials and wage-earners separately the number and salaries or wages of men, women, and children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals are shown for the different materials and products of smelting and refining, respectively. Considerable quantities of ore are smelted or refined on contract. The amounts received for contract work, aggregating \$1,598,038, are given in the table, and the ores thus treated are included in the quantities and values of the materials and products. The number of engines, water wheels, etc., and their horsepower, are presented and the 39 establishments are grouped according to the number of employees in each.

TABLE 13.—LEAD SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899.

	United States.	Colorado.	Missouri.	Montana.	All other states and territories. ¹
Number of establishments.....	39	8	11	3	17
Character of organization:					
Individual.....	5		1		4
Firm and limited partnership.....	1		1		
Incorporated company.....	33	8	9	3	13
Established during the decade.....	10	1	5		4
Established during the census year.....					
Capital:					
Total value.....	\$72,148,993	\$22,569,715	\$944,539	\$2,858,158	\$45,776,521
Land.....	\$3,704,552	\$1,057,264	\$107,000	\$63,334	\$2,478,954
Buildings.....	\$21,974,850	\$7,064,040	\$269,550	\$339,953	\$13,701,307
Machinery, tools, and implements.....	\$26,480,025	\$8,752,414	\$61,128	\$1,191,663	\$16,474,820
Cash and sundries.....	\$19,989,506	\$5,695,997	\$506,861	\$663,208	\$13,123,440
Proprietors and firm members.....	7		3		4
Salaried officials, clerks, etc.:					
Total number.....	425	137	35	27	226
Total salaries.....	\$754,913	\$288,119	\$47,360	\$78,818	\$345,616
Officers of corporations—					
Number.....	20		8	4	8
Salaries.....	\$66,905		\$15,200	\$17,700	\$34,005
General superintendents, managers, clerks, and salesmen—					
Total number.....	405	137	27	23	218
Total salaries.....	\$688,008	\$288,119	\$32,160	\$56,118	\$311,611
Men—					
Number.....	402	137	26	22	217
Salaries.....	\$685,428	\$288,119	\$31,560	\$54,858	\$310,891
Women—					
Number.....	3		1	1	1
Salaries.....	\$2,580		\$600	\$1,260	\$720

¹ Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

TABLE 13.—LEAD SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899—Continued.

	United States.	Colorado.	Missouri.	Montana.	All other states and territories. ¹
Wage-earners, including pieceworkers, and total wages:					
Greatest number employed at any one time during the year	10,148	4,247	598	717	4,581
Least number employed at any one time during the year	6,778	2,539	398	464	3,377
Average number	8,319	3,316	474	563	3,966
Wages	\$5,088,684	\$2,390,383	\$255,500	\$397,771	\$2,044,940
Men, 16 years and over—					
Average number	8,312	3,316	473	563	3,960
Wages	\$5,086,704	\$2,390,383	\$255,362	\$397,771	\$2,043,188
Children, under 16 years—					
Average number	7		1		6
Wages	\$1,980		\$223		\$1,752
Average number of wage-earners, including pieceworkers, employed during each month:					
Men, 16 years and over—					
January	8,806	3,655	399	604	4,148
February	8,186	3,444	384	584	3,774
March	8,383	3,235	487	568	4,098
April	8,565	3,505	487	525	4,048
May	8,015	3,240	427	543	3,808
June	7,880	2,470	466	515	3,879
July	7,139	2,240	526	488	3,885
August	8,068	3,277	496	458	3,842
September	8,608	3,630	508	545	3,980
October	8,779	3,690	514	601	3,974
November	8,946	3,670	487	617	4,172
December	8,915	3,784	498	715	3,968
Children, under 16 years—					
January	7		1		6
February	7		1		6
March	7		1		6
April	7		1		6
May	7		1		6
June	7		1		6
July	7		1		6
August	7		1		6
September	7		1		6
October	7		1		6
November	7		1		6
December	7		1		6
Miscellaneous expenses:					
Total	\$1,166,210	\$154,001	\$41,565	\$47,626	\$923,018
Rent of works	\$2,626				\$2,626
Taxes, not including internal revenue	\$86,390	\$32,269	\$5,601	\$8,596	\$39,924
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	\$1,077,194	\$121,732	\$35,964	\$39,030	\$380,463
Materials used:²					
Aggregate cost	\$169,703,366	\$43,201,710	\$3,317,558	\$4,895,771	\$118,348,327
Smelters—					
Total cost	\$65,789,219	\$33,166,211	\$3,285,190	\$4,308,806	\$25,029,012
Ores—					
Domestic—					
Tons	1,667,545	1,050,957	68,719	145,864	402,505
Cost	\$53,532,321	\$30,862,018	\$3,124,394	\$3,676,436	\$15,569,473
Foreign—					
Tons	284,914	932		8,750	280,232
Cost	\$7,336,159	\$313,385		\$184,099	\$6,838,675
Fuel	\$3,191,286	\$1,392,316	\$104,607	\$356,980	\$1,337,988
Rent of power and heat	\$26,446			\$18,958	\$12,488
Mill supplies	\$504,530	\$344,059	\$16,010	\$28,345	\$116,116
All other materials	\$1,198,527	\$254,433	\$40,179	\$49,588	\$354,327
Refiners and desilverizers:					
Total cost	\$102,096,628	\$9,939,214			\$92,157,414
Base bullion—					
Domestic—					
Tons	180,998	25,794			155,204
Cost	\$80,940,771	\$9,879,781			\$71,060,990
Foreign—					
Tons	78,939				78,939
Cost	\$19,861,733				\$19,861,733
Fuel	\$250,519	\$18,435			\$232,084
Mill supplies	\$104,670	\$9,133			\$95,537
All other materials	\$928,935	\$31,315			\$907,120
Freight	\$1,817,519	\$96,285	\$32,368	\$526,965	\$1,161,901
Products:²					
Aggregate value	\$200,974,507	\$49,987,006	\$3,852,435	\$5,264,253	\$141,920,813
Smelting—					
Total value	\$31,430,717	\$39,772,746	\$3,852,435	\$5,264,253	\$32,541,283
Non-argentiferous ores—					
Total value	\$4,114,336		\$3,852,435		\$261,901
Soft lead—					
Pounds	90,478,286		33,952,833		6,520,453
Value	\$3,801,242		\$3,539,341		\$261,901
Lead oxide—					
Pounds	10,329,804		10,829,804		
Value	\$299,201		\$299,201		
All other products of non-argentiferous ores—					
Value	\$13,893		\$13,893		
Contract work on non-argentiferous ores	\$25,332		\$25,332		
Argentiferous ores—					
Total value	\$77,316,381	\$39,772,746		\$5,264,253	\$32,279,382
Lead contents of base bullion—					
Pounds	402,324,605	219,304,385		40,853,057	142,167,163
Value	\$15,546,661	\$3,613,296		\$1,332,515	\$5,550,850
Silver—					
Ounces fine	52,641,752	24,464,621		4,356,099	23,821,032
Value	\$31,135,203	\$14,680,839		\$2,550,556	\$13,953,758
Gold—					
Ounces fine	1,322,177	760,240		54,415	507,522
Value	\$26,523,171	\$15,194,872		\$1,088,992	\$10,244,307
Copper contents of matte—					
Pounds	26,964,031	9,269,744		791,162	16,003,125
Value	\$3,765,402	\$1,276,350		\$76,881	\$2,414,671
All other products of argentiferous ores—					
Value	\$287,944	\$3,839		\$103,300	\$116,796
Contract work on argentiferous ores—					
Amount received	\$118,407				\$118,407

¹ Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

² The difference between the cost of materials, and also for value of products for Colorado, all other states, and the United States total as shown above, and as shown in Table 1, is caused by the duplication in the above table, under the heads of "refining and desilverizing base bullion," and "smelting argentiferous ores," to the amount of \$9,204,735 for Colorado, \$16,303,463 for all other states, and \$25,508,203 for the United States, which amounts represent the intermediate product between the ore and the refined metal.

TABLE 13.—LEAD SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899—Continued.

	United States.	Colorado.	Missouri.	Montana.	All other states and territories. ¹
Products—Continued.					
Refining and desilverizing—					
Total value.....	\$119,543,790	\$10,164,260			\$109,379,530
Hard or antimonial lead—					
Pounds.....	16,785,097	1,402,948			15,382,149
Value.....	\$701,082	\$59,156			\$641,926
All other lead (including Doré bars)—					
Pounds.....	480,670,884	42,723,944			487,946,890
Value.....	\$20,672,140	\$1,822,735			\$18,849,405
Doré bars, contents of precious metals—					
Silver—					
Ounces fine.....	70,420,917	5,769,336			64,651,581
Value.....	\$42,143,703	\$3,429,993			\$38,713,710
Gold—					
Ounces fine.....	2,514,836	234,763			2,280,073
Value.....	\$52,010,121	\$4,852,376			\$47,157,745
All other products of refining and desilverizing—					
Value.....	\$4,016,744				\$4,016,744
Contract work on refining and desilverizing—					
Amount received.....	\$1,454,249				\$1,454,249
Foreign lead smelted or refined in bond and reexported—					
Pounds.....	148,300,164				148,300,164
Value.....	\$5,517,569				\$5,517,569
Power:					
Number of establishments reporting.....	96	7	9	3	17
Owned—					
Total horsepower.....	16,952	7,590	830	1,205	7,237
Engines—					
Steam:					
Number.....	171	60	21	4	36
Horsepower.....	13,948	6,747	830	500	5,871
Gas or gasoline—					
Number.....	5	2			3
Horsepower.....	169	89			70
Water wheels—					
Number.....	14	5		1	8
Horsepower.....	373	92		40	241
Electric motors—					
Number.....	12	4			8
Horsepower.....	610	235			375
Other power—					
Horsepower.....	452	427			25
Rented horsepower.....	1,410			755	655
Establishments classified by number of persons employed, not including proprietors and firm members:					
Total number of establishments.....	39	8	11	3	17
Under 5.....	3		2		1
5 to 20.....	4		1		3
21 to 50.....	6		4	1	1
51 to 100.....	4		2		2
101 to 250.....	8	2	2	1	3
251 to 500.....	6	2			4
501 to 1,000.....	5	2		1	2
Over 1,000.....	3	2			1

¹ Includes establishments distributed as follows: California, 1; Idaho, 1; Illinois, 2; Iowa, 1; Kansas, 2; Nebraska, 1; New Jersey, 2; New Mexico, 1; Texas, 1; Utah, 2; Virginia, 1; Washington, 2.

COPPER SMELTING AND REFINING.

The production of copper in the United States during the year 1899 was the largest in the history of the industry. The rapid increase in production dates from 1879, when the annual product amounted to 23,000 long tons. It increased to 101,239 long tons in 1889 and 269,016 long

tons in 1899. The magnitude of the industry in 1899 is indicated by the statistics given in Table 14, which shows the totals for the United States and for each state and territory in which there were three or more establishments during that year.

TABLE 14.—COPPER SMELTING AND REFINING: SUMMARY FOR THE UNITED STATES.

	United States.	Arizona.	California.	Colorado.	Michigan.	Montana.	New Jersey.	All other states and territories. ¹
Number of establishments.....	47	9	8	8	8	7	7	15
Capital:								
Total.....	\$53,068,395	\$7,265,659	\$1,114,882	\$2,308,809	\$1,523,407	\$26,824,298	\$6,943,886	\$7,082,954
Land.....	\$2,091,415	\$122,266	\$11,500	\$99,998	\$35,000	\$309,846	\$854,154	\$659,151
Buildings.....	\$15,670,959	\$965,024	\$278,734	\$623,885	\$1,096,107	\$9,195,526	\$1,568,545	\$1,943,138
Machinery, tools, and implements.....	\$5,771,389	\$515,937	\$131,845	\$429,238	\$196,367	\$2,349,499	\$970,991	\$1,177,672
Cash and sundries.....	\$29,529,632	\$5,662,432	\$692,803	\$1,155,188	\$195,993	\$14,969,927	\$3,550,196	\$3,303,093
Salaried officials, clerks, etc., number.....	488	80	21	80	17	107	74	159
Salaries.....	\$954,905	\$140,621	\$25,857	\$59,765	\$25,500	\$233,711	\$138,728	\$331,223
Wage-earners, average number.....	11,324	1,648	381	410	462	4,290	1,707	2,426
Total wages.....	\$3,529,021	\$1,276,739	\$342,491	\$315,058	\$364,647	\$3,791,933	\$915,112	\$1,522,091
Miscellaneous expenses.....	\$1,522,325	\$266,548	\$90,026	\$11,547	\$33,685	\$556,852	\$290,423	\$273,244
Cost of materials used.....	\$122,174,129	\$6,370,884	\$1,379,423	\$3,335,113	\$16,754,220	\$20,556,336	\$32,545,179	\$41,182,974
Value of products.....	\$165,131,670	\$17,286,517	\$4,508,259	\$8,393,034	\$17,340,041	\$36,337,063	\$38,365,131	\$47,351,625

¹ Includes establishments distributed as follows: Connecticut, 2; Illinois, 1; Maryland, 1; Nevada, 1; New Mexico, 1; New York, 2; Ohio, 1; South Dakota, 1; Tennessee, 1; Utah, 2; Virginia, 1; Washington, 1.

In addition to the 47 active establishments shown in the foregoing table, there were 9 idle establishments with a capital of \$371,320; 4 located in Arizona, 1 in California, 1 in Illinois, and 3 in Nevada. The statistics given in Table 14 include all establishments engaged in the smelting or refining of copper, but, as in the case of lead smelting or refining, the product of the precious metals in some of these establishments exceeds in value the copper product. In connection with the smelting of copper, 25 establishments smelted 8,866,472 fine ounces of silver and 23 smelted 300,914 fine ounces of gold. Of the refineries, 11 reported a product of 13,229,911 fine ounces of silver and 10 a product of 224,352 fine ounces of gold. The total value of the gold and silver reported by the 47 establishments was \$23,257,961, being 14.1 per cent of \$165,131,670, the aggregate value of all products. The aggregate value of products is the sum of the products of the smelters and refineries, respectively. The two branches of the industry are conducted almost entirely by independent plants, but the products of the smelters, which, as shown in Table 24, were valued at \$54,275,173, are largely sold to the refineries as material, and are therefore largely duplicated in the \$107,635,247 given in the same table as the value of the products of the refineries. Under these conditions, the products of the refineries may be accepted as the finished products of the industry; particularly is this the case since the Michigan ore, not being smelted, first appears in this report as a product of the refining plant.

Large quantities of ore are smelted, and large quantities of metal are refined on contract. It appears from Table 26 that the smelters and refineries received \$293,961 and \$3,452,855, respectively, for this class of work. While in such cases the ore or metal is not purchased nor the finished product owned by the establishments doing the

work, nevertheless it is necessary to report the quantities and cost of both in order to ascertain the total quantities and cost of ore and base metal treated and of finished products manufactured in the United States. Therefore all establishments were required to report the total quantities and cost of all materials that passed through the respective plants and the total quantities and values of all their products, irrespective of the ownership. Establishments doing contract work were also required to report the amount received for such work and these amounts are shown as separate items under products in Table 13.

While the industry has made rapid progress during the past twenty years, the statistics concerning capital, employees, wages, and products shown in the reports on mineral industries at the censuses of 1880 and 1890 are so meager that they can not be used for comparison with those for 1900.

Table 15 shows the totals for the industry as reported at the census of 1890.

TABLE 15.—STATISTICS OF COPPER SMELTING AND REFINING: 1890.

Capital, total.....	\$4,037,593
Land.....	634,000
Buildings and fixtures.....	1,758,856
Tools, implements, etc.....	600,214
Cash, etc.....	1,044,523
Expenditures, total.....	1,885,261
Wages.....	800,484
Salaries.....	71,720
Paid contractors.....	19,591
Supplies and materials.....	737,098
Rent, interest, insurance, taxes, etc.....	256,368

In the absence of other trustworthy data, the quantity of copper produced must be accepted as indicating the extent of the increase in the industry. Table 16, taken from the report of the Geological Survey on "The Production of Copper in 1899," shows the quantity of copper produced in each year from 1845 to 1899, inclusive.

TABLE 16.—PRODUCTION OF COPPER IN THE UNITED STATES FROM 1845 TO 1899.

YEAR.	Total production, United States.	Lake Superior.	Percentage of Lake Superior of total product.	YEAR.	Total production, United States.	Lake Superior.	Percentage of Lake Superior of total product.
	<i>Long tons.</i>	<i>Long tons.</i>			<i>Long tons.</i>	<i>Long tons.</i>	
1845	100	12	12.0	1863	8,500	5,797	68.2
1846	150	26	17.3	1864	8,000	5,576	69.7
1847	300	213	71.0	1865	8,500	6,410	75.4
1848	500	461	92.2	1866	8,900	6,138	69.0
1849	700	672	96.0	1867	10,000	7,824	78.2
1850	650	572	88.0	1868	11,600	9,346	80.6
1851	900	779	86.6	1869	12,500	11,886	95.1
1852	1,100	792	72.0	1870	12,600	10,992	87.2
1853	2,000	1,297	64.9	1871	13,000	11,942	91.9
1854	2,250	1,819	80.8	1872	12,500	10,961	87.7
1855	3,000	2,593	86.4	1873	15,500	13,433	86.7
1856	4,000	3,666	91.7	1874	17,500	15,327	87.6
1857	4,800	4,255	88.6	1875	18,000	16,039	89.4
1858	5,500	4,083	74.3	1876	19,000	17,085	89.9
1859	6,300	5,985	94.9	1877	21,000	17,422	83.0
1860	7,200	5,888	81.8	1878	21,500	17,719	82.4
1861	7,500	6,713	89.5	1879	23,000	19,129	83.2
1862	9,000	6,065	67.4	1880	27,000	22,204	82.2

TABLE 16.—PRODUCTION OF COPPER IN THE UNITED STATES FROM 1845 TO 1899—Continued.

YEAR.	Total production, United States.	Lake Superior.	Percentage of Lake Superior of total product.	Montana.	Percentage of Montana of total product.	Arizona.	Percentage of Arizona of total product.	YEAR.	Total production, United States.	Lake Superior.	Percentage of Lake Superior of total product.	Montana.	Percentage of Montana of total product.	Arizona.	Percentage of Arizona of total product.
	<i>Long tons.</i>	<i>Long tons.</i>		<i>Long tons.</i>		<i>Long tons.</i>			<i>Long tons.</i>	<i>Long tons.</i>		<i>Long tons.</i>		<i>Long tons.</i>	
1881	32,000	24,363	76.1					1891	126,339	50,992	40.2	50,023	39.5	17,800	14.0
1882	40,467	25,489	62.9					1892	154,018	54,999	35.7	72,860	47.3	17,160	11.1
1883	51,574	26,653	51.6	11,011	21.3	10,658	20.7	1893	147,033	50,270	34.2	69,290	47.1	19,200	13.1
1884	64,708	30,961	47.8	19,256	29.8	11,985	18.4	1894	158,120	51,081	32.3	81,729	51.6	19,873	12.6
1885	74,052	32,209	43.5	30,267	40.9	10,137	13.7	1895	169,917	57,737	34.0	84,900	50.0	21,408	12.6
1886	70,430	36,124	51.3	25,362	36.0	6,990	9.9	1896	205,384	64,073	31.2	99,071	48.2	32,560	15.8
1887	81,017	33,941	41.9	35,133	43.4	7,910	9.7	1897	220,571	64,358	29.4	102,807	46.6	36,398	16.5
1888	101,054	38,604	38.2	43,704	43.2	14,195	14.0	1898	235,050	66,291	28.2	92,341	39.2	49,624	21.1
1889	101,239	39,364	38.7	43,849	43.3	13,654	13.5	1899	253,870	65,803	25.9	100,503	39.6	59,399	23.4
1890	115,966	45,273	38.9	50,437	43.5	15,534	13.4								

As shown in Table 16, the production of copper in the United States during the year 1899, reported to the United States Geological Survey, amounted to 253,870 long tons; this included the copper contents of blue vitriol, and also the copper reported as a by-product of lead smelters. The refined copper product shown in this report as "ingots, wire, bars, etc.," amounts to 602,595,113 pounds, or 269,016 long tons. (See Table 17.) There were also 27,298,926 pounds of blue vitriol reported, and, allowing one-fourth as representing the copper contents, gives 6,824,732 pounds, or 3,047 long tons of copper, making an aggregate product of 272,063 long tons. This, however, includes the copper extracted from imported ores and mattes, while the report of the United States Geological Survey deals only with copper of domestic origin. Practically all of the copper matte reported by the lead smelting works appears as raw material in the returns of the copper refineries.

Prior to 1879 the larger part of the copper product was

obtained from the Lake Superior region, but since that date the percentage obtained from that district has been steadily decreasing, although its production has increased more than threefold. The discovery of the rich deposits in Arizona, Montana, and other localities has caused a wider distribution of the industry.

While the location of the establishments engaged in copper smelting is controlled very largely by the source of the ore, still, in many cases the ore is transported to meet other materials or more favorable conditions for smelting. The products of the smelters are again transported to refineries, which are situated in localities more convenient for securing the materials used in the processes and are in closer touch with the market for the finished products. These conditions have caused a wide distribution of the establishments and have tended to specialize and localize the two branches of the industry.

Table 17 presents separately the statistics for establishments located east and west of the Mississippi River.

TABLE 17.—COPPER SMELTING AND REFINING: ESTABLISHMENTS BY LOCATION EAST AND WEST OF THE MISSISSIPPI RIVER.

	United States.	East of the Mississippi.	West of the Mississippi.
Number of establishments	47	19	28
Capital	\$53,063,395	\$13,680,503	\$39,382,892
Salaries	488	226	262
Wage-earners, average number	\$954,905	\$416,981	\$537,924
Total wages	11,324	4,083	7,241
Miscellaneous expenses	\$3,529,021	\$2,323,370	\$6,205,651
Materials used:	\$1,522,325	\$551,223	\$971,097
Total cost	\$122,174,129	\$56,840,595	\$65,333,534
Ores:			
Tons	4,089,315	189,514	3,899,801
Cost	\$25,190,522	\$733,622	\$24,456,900
Matte purchased:			
Tons	48,182	43,954	4,228
Cost	\$10,518,431	\$9,767,037	\$746,394
Blister or anodes purchased:			
Tons	284,020	284,020	—
Cost	\$72,401,654	\$72,401,654	—
All other materials	\$14,068,522	\$3,938,282	\$10,130,240
Products:			
Aggregate value	\$165,181,670	\$97,532,016	\$67,299,654
Smelting:			
Total value	\$54,275,178	\$1,140,240	\$53,135,038
Fine copper contents of blister or anodes:			
Pounds	197,056,734	2,930,000	194,126,734
Value	\$25,858,917	\$440,000	\$25,418,917
Fine copper contents of matte:			
Pounds	187,622,709	3,640,418	183,982,291
Value	\$17,511,180	\$453,462	\$17,057,718
Silver:			
Fine ounces	8,866,472	305,487	8,560,985
Value	\$5,020,050	\$172,038	\$4,848,017
Gold:			
Fine ounces	300,914	3,486	297,428
Value	\$5,890,076	\$69,645	\$5,820,431
Refining:			
Total value	\$107,635,247	\$93,470,626	\$14,164,621
Ingots, wire, bars, etc.:			
Pounds	602,595,113	507,190,645	95,404,468
Value	\$94,061,667	\$81,871,103	\$12,190,564
Blue vitriol:			
Pounds	27,298,926	26,017,613	1,281,313
Value	\$1,225,745	\$1,178,205	\$47,537
Silver:			
Fine ounces	13,229,911	10,203,023	3,026,888
Value	\$7,790,985	\$5,076,707	\$1,714,278
Gold:			
Fine ounces	224,852	213,740	10,612
Value	\$4,556,850	\$4,344,693	\$212,242
All other products, value	\$3,221,250	\$3,221,250	—

Table 17 shows that 28 of the 47 establishments engaged in the industry are located west of the Mississippi and that their product was valued at \$67,299,654, or 40.8 per cent of the total. All the establishments west of the Mississippi were engaged in smelting, 25 of them in smelting exclusively, and 3 in both smelting and refining, their proximity to the source of the ore resulting in the development of this branch of the industry. Their smelting product amounted to \$53,135,038, or 97.9 per cent of the \$54,275,178 reported as the product of all smelters. The fine copper contents of the blister and matte reported by the establishments in the Western states amounted to 328,109,025 pounds, or 98 per cent of the total.

While the smelting industry is largely confined to the establishments located in the Western states, the refining is peculiar to the establishments in the Eastern states. Of the 19 establishments east of the Mississippi, 16 were refineries and their product amounted to \$93,470,626, or 86.8 per cent of the \$107,635,247 reported as the product of all refining. There were 7 refineries located in the state of New Jersey, their refined product, not including by-products, amounting to \$35,149,583, or 32.7 per cent of the total product of refineries. Montana was the only western state in which ingots, wire, bars, and finished refined products were made, the product of the state amounting

to 95,404,468 pounds. The remaining 507,190,645 pounds of refined copper were manufactured in the Eastern states.

Michigan appears in the tables with only a part of the product of the Lake Superior district, since a considerable part of the native copper or "mineral" produced is shipped East for refining. The statistics of the stamp mills and concentrating plants of Lake Superior are not included in this investigation. It is a fact, however, that the native copper produced by the Lake Superior mines goes almost entirely to a number of refineries which treat no other copper material. Segregating these, we have the following statistics:

Refining Lake Superior Mineral.

Expenditures:	
Wages	\$475,501
Superintendence	49,703
Fuel	103,813
Supplies and materials, not including cost of "mineral"	195,361
Rent, interest, insurance, etc.	49,368
Total	\$983,779
"Mineral" treated, short tons	121,243
Refined copper product, pounds	157,940,824

The foregoing statistics show the average expenditure per pound of refined copper to be .591 of a cent.

In recent years the increasing utilization by concentration of the finer slimes of the stamp mills has led to the

production of lower grades of "mineral." This is reflected in the statistics, which show that the mineral treated by the refineries averaged 65.1 per cent of copper.

Table 18 shows the quantities and cost of the ore, matte, and blister or anodes used as material and the number of establishments reporting each.

TABLE 18.—QUANTITIES AND COST OF MATERIALS USED AND NUMBER OF ESTABLISHMENTS REPORTING EACH CLASS.

CLASS.	Number of establishments reporting.	Tons.	Cost.
Total cost			\$122, 174, 129
Ores	33	4, 039, 315	25, 190, 522
Matte (purchased)	11	48, 182	10, 513, 431
Blister or anodes (purchased)	13	284, 020	72, 401, 654
All other materials, including fuel, mill supplies, etc			14, 068, 522

As previously explained, the quantities and cost shown in Table 18 include the materials worked on contract, for which class of work \$3,746,816 was received.

Of the 47 establishments engaged in the industry 33 reported the consumption of 4,039,315 long tons of ores, valued at \$25,190,522; 11 reported that they purchased 48,182 long tons of matte, valued at \$10,513,431; and 13, the purchase of 284,020 long tons of blister or anodes, valued at \$72,401,654. In cases where matte and blister or anodes were manufactured as an intermediate product and consumed in the same establishment, its quantity or value was not ascertained. The matte and blister or anodes shown in Table 18 represent the quantities and value of these classes of materials purchased by the establishments consuming them, or which were refined on contract.

In the preceding tables, states in which there were less than 3 establishments have been grouped so as to avoid disclosing the operations of individual establishments. Table 19 shows the quantities of materials used in each of the states and territories irrespective of the number of establishments.

TABLE 19.—MATERIALS USED, BY STATES.

STATES AND TERRITORIES.	Ores.	Matte purchased.	Blister or anodes purchased.
United States	Tons. 4, 039, 315	Tons. 48, 182	Tons. 284, 020
Arizona	752, 642	1, 413	
California	223, 251	20	
Colorado	159, 729		
Connecticut		821	14, 746
Illinois		2, 400	
Maryland		82	75, 165
Michigan			88, 852
Montana	2, 442, 636	2, 795	
Nevada	19, 071		
New Jersey	3, 766	29, 778	72, 867
New Mexico	23, 048		
New York	45, 000	10, 920	37, 891
Ohio			
South Dakota	124, 132		
Tennessee	85, 723		
Utah	65, 292		
Virginia	5, 025		
Washington	90, 000		

The large consumption of ore in the Western states is, of course, due to the proximity of the mines; the quantity used in these states amounted to 3,899,801 long tons, or 96.5 per cent of the total. The greater part of the ores used in the Eastern states is imported. The smelters in the state of Montana reported 2,442,636 long tons of ores, or 60.5 per cent of the total of all ores treated. The smelters in Arizona rank second in the quantity of ore consumed, reporting 752,642 long tons. California, with 223,251 long tons, ranks third; Colorado, with 159,729, fourth; and South Dakota, with 124,132 long tons, fifth, a considerable part of the ore of the latter state having been drawn from Montana. The refineries located in New Jersey, Michigan, Maryland, and New York are, in the order named, the largest consumers of matte and blister.

There were 26 establishments which reported ore and 13 which reported matte and blister or anodes as the only component materials used during the census year. The remaining 8 establishments used both classes of materials.

Table 20 shows the statistics for the 47 establishments arranged in these 3 groups.

TABLE 20.—ESTABLISHMENTS CLASSIFIED ACCORDING TO MATERIALS USED.

	All establish- ments.	Using ores only.	Using matte and blister or anodes only.	All other establishments.
Number of establishments.....	47	26	18	8
Capital.....	\$58,068,895	\$35,973,221	\$9,232,105	\$7,858,069
Salaries.....	488	239	124	125
Wage-earners, average number.....	\$654,905	\$494,695	\$211,081	\$249,179
Total wages.....	11,324	6,399	2,844	2,581
Miscellaneous expenses.....	\$3,529,021	\$5,586,784	\$1,393,006	\$1,549,231
Materials used:	\$1,522,325	\$988,139	\$192,272	\$391,914
Total cost.....	\$122,174,129	\$32,028,770	\$74,103,544	\$16,041,815
Ores:				
Tons.....	4,089,315	3,699,879		339,436
Cost.....	\$25,190,522	\$22,858,610		\$2,331,912
Matte and blister or anodes:				
Tons.....	332,202		282,850	49,352
Cost.....	\$82,915,085		\$72,300,691	\$10,614,494
All other materials.....	\$14,068,522	\$9,170,160	\$1,802,953	\$3,095,409
Products:				
Aggregate value.....	\$165,131,670	\$58,892,793	\$32,438,564	\$23,800,313
Smelting:				
Total value.....	\$54,275,173	\$44,775,709		\$9,499,464
Fine copper contents of blister or anodes:				
Pounds.....	197,056,784	145,436,875		51,619,859
Value.....	\$25,853,917	\$18,774,901		\$7,079,016
Fine copper contents of matte:				
Pounds.....	137,022,709	126,178,705		11,444,004
Value.....	\$17,511,130	\$15,906,544		\$1,604,586
Silver:				
Fine ounces.....	8,866,472	7,906,717		959,755
Value.....	\$5,020,050	\$4,456,251		\$563,799
Gold:				
Fine ounces.....	800,914	281,981		18,933
Value.....	\$5,890,076	\$5,638,013		\$252,063
Refining:				
Total value.....	\$107,685,247	\$14,117,084	\$30,830,954	\$12,327,209
Ingots, wire, bars, etc.:				
Pounds.....	602,595,113	95,404,468	442,307,615	64,883,030
Value.....	\$94,061,667	\$12,190,564	\$71,652,923	\$10,218,175
Blue vitriol:				
Pounds.....	27,298,926		18,017,613	14,231,313
Value.....	\$1,225,745		\$578,208	\$647,537
Silver:				
Fine ounces.....	13,229,911	3,026,883	9,555,948	647,075
Value.....	\$7,790,985	\$1,714,278	\$5,688,470	\$388,237
Gold:				
Fine ounces.....	224,362	10,612	145,066	68,674
Value.....	\$4,556,850	\$212,242	\$2,971,348	\$1,378,260
All other products, value.....	\$3,221,250		\$1,547,610	\$1,673,640

Of the 26 establishments shown in Table 20 which used ore only as the component material, 24 were engaged exclusively in smelting and 2 in smelting and refining. The 26 establishments consumed 3,699,879 long tons of ores, and their products consisted of 42,591 long tons of refined copper, 121,257 long tons copper contents of matte and blister or anodes, 10,933,605 fine ounces of silver, and 292,593 fine ounces of gold.

The 13 establishments using only matte and blister or anodes as their raw materials were engaged in refining exclusively. They consumed 282,850 long tons of material and their product amounted to 203,270 long tons of refined copper and blue vitriol.

While, for the reasons given in the general discussion of the statistics of manufactures, the difference between the sum of the expenditures for salaries, wages, miscellaneous expenses, and materials and the value of the products can not be accepted as showing the profit or loss in the business, the totals given in Table 20 may be used to ascertain the proportions which the different items of expenditure are of the total expenses in the establishments using respectively ore only, or matte and blister only, or both classes of material. Table 21 shows each item of cost and the percentage which it forms of the total cost for each of the classes of establishments.

TABLE 21.—SALARIES, WAGES, MISCELLANEOUS EXPENSES, AND MATERIALS FOR ESTABLISHMENTS CLASSIFIED ACCORDING TO MATERIALS USED.

	ALL ESTABLISHMENTS.		USING ORES ONLY.		USING MATTE AND BLISTER OR ANODES ONLY.		ALL OTHER ESTABLISHMENTS.	
	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.
Total.....	\$133,180,380	100.0	\$39,048,388	100.0	\$75,899,853	100.0	\$18,232,139	100.0
Salaries.....	954,905	0.7	494,695	1.3	211,081	0.3	249,179	1.4
Wages.....	8,529,021	6.4	5,586,784	14.3	1,393,006	1.8	1,549,231	8.5
Miscellaneous expenses.....	1,522,325	1.2	988,139	2.4	192,272	0.3	391,914	2.1
Materials.....	122,174,129	91.7	32,028,770	82.0	74,103,544	97.6	16,041,815	88.0

As previously explained, the aggregate value of products, \$165,131,670, consists of the products of both smelters and refineries. Table 22 separates these two classes of products,

showing the quantities and values of each, and also the number of establishments manufacturing each.

TABLE 22.—QUANTITIES AND VALUE OF PRODUCTS.

CLASS.	Number of establishments reporting.	PRODUCTS.		
		Unit of measure.	Quantities.	Value.
Aggregate value				\$165,131,670
Smelting:				
Total value				54,275,173
Fine copper contents of blister or anodes	15	Pound	197,056,734	25,853,917
Fine copper contents of matte	21	Pound	137,622,709	17,511,130
Silver	25	Oz. fine	8,866,472	5,020,050
Gold	23	Oz. fine	300,914	5,890,076
Refining:				
Total value				107,685,247
Ingots, wire, bars, etc.	18	Pound	602,595,113	94,061,667
Blue vitriol	7	Pound	27,298,926	1,225,745
Silver	11	Oz. fine	13,229,911	7,790,985
Gold	10	Oz. fine	224,352	4,556,850
All other products				3,221,250

The fine copper contents of blister and matte shown in Table 22 is the quantity manufactured for sale, and does not include the quantity manufactured as an intermediate

product. Of the 47 establishments, 15 manufactured blister or anodes and 21 matte for sale. By reference to Table 18, it appears that 13 establishments purchased blister or anodes and 11 purchased matte as material. No comparisons, however, can be made between the quantities of these ingredients manufactured for sale and the quantities purchased, because the purchases may be the products of preceding years, and while the total weight is reported for the quantities purchased as material, the copper contents only are given for the quantities sold as product. Silver was a product of 25 and gold of 23 smelters. Of the refiners, it appears that only 18 manufactured a finished copper product, 7 made blue vitriol, 11 refined silver, and 11 refined gold.

Table 23 shows the quantities of each product for both branches of the industry in each state and territory, irrespective of the number of establishments engaged in its manufacture.

TABLE 23.—PRODUCTS BY STATES.

STATES AND TERRITORIES.	SMELTING.				REFINING.			
	Fine copper contents of blister or anodes.	Fine copper contents of matte.	Silver.	Gold.	Ingots, wire, bars, etc.	Blue vitriol.	Silver.	Gold.
	Pounds.	Pounds.	Oz. fine.	Oz. fine.	Pounds.	Pounds.	Oz. fine.	Oz. fine.
United States	197,056,734	137,622,709	8,866,472	300,914	602,595,113	27,298,926	13,229,911	224,352
Arizona	75,127,116	52,832,952	711,873	18,074		1,281,313		
California	84,000	25,868,637	427,315	23,328				
Connecticut					29,950,425			
Colorado		21,212,797	728,384	71,396				
Illinois					4,517,647			
Maryland					188,619,824	11,190,341	2,308,582	11,788
Michigan					102,001,189			
Montana	112,775,861	24,492,199	6,082,031	45,781	95,404,468		3,026,883	10,612
Nevada		536,075	30,985	249				
New Jersey	2,930,000		301,800	3,453	170,326,925	1,818,272	7,594,285	150,949
New Mexico		3,869,082	125,482	6,252				
New York					60,774,635	13,000,000	300,150	51,003
Ohio								
South Dakota		2,175,549	317,263	84,723				
Tennessee		3,408,618						
Utah	6,139,757		88,202	7,625				
Virginia		231,800	3,637	33				
Washington		3,000,000	100,000	40,000				

As shown by Table 23, a refined copper product of ingots, wire, bars, etc., was manufactured in 7 states, the largest product, 170,326,925 pounds, being reported for the state of New Jersey. The 4 eastern states, Connecticut, Maryland, New Jersey, and New York, produced 400,671,809 pounds, or 66.5 per cent of the total, while the 3 western states, Illinois, Michigan, and Montana, produced 201,923,304 pounds, or 33.5 per cent of the total. The table shows that 26,017,613 pounds, or 95.3 per cent of the total product, of blue vitriol were manufactured in the 3 eastern states, Maryland, New Jersey, and New York, the remaining 1,281,313 pounds being reported for Arizona.

Table 23 also shows the large quantities of partially finished product, blister or anodes, and matte manufactured in the Western states. This class of product is shown for 12 states and territories, 9 of them being west of the Mississippi River. Of the total, 334,679,443 pounds, reported as the fine copper contents of blister or anodes and matte, 328,109,025 pounds, or 98 per cent, were made in the Western states and 6,570,418 pounds, or 2 per cent, in the Eastern states.

Table 24 presents separately the statistics for the 27 establishments engaged exclusively in smelting, the 15 engaged in refining, and the 5 in both processes.

TABLE 24.—ESTABLISHMENTS CLASSIFIED ACCORDING TO PROCESS EMPLOYED.

	All establish- ments.	Smelting only.	Refining only.	Smelting and refining.
Number of establishments.....	47	27	15	5
Capital.....	\$53,063,395	\$19,375,065	\$12,166,962	\$21,521,368
Salaries, clerks, etc., number.....	488	221	180	87
Salaries.....	\$951,905	\$485,784	\$335,526	\$188,595
Wage-earners, average number.....	11,324	4,203	3,213	3,908
Total wages.....	\$8,529,021	\$3,576,429	\$1,895,705	\$3,056,887
Miscellaneous expenses.....	\$1,522,325	\$621,573	\$388,243	\$512,509
Materials used:				
Total cost:	\$122,174,129	\$18,558,180	\$30,268,050	\$23,347,940
Ores:				
Tons.....	4,039,315	1,593,291	48,363	2,097,721
Cost.....	\$25,190,522	\$12,346,785	\$477,004	\$12,372,738
Matte and blister or anodes:				
Tons.....	382,202	2,302	312,215	17,085
Cost.....	\$82,915,085	\$621,393	\$77,713,691	\$4,580,001
All other materials.....	\$14,068,522	\$5,595,552	\$2,077,364	\$6,395,206
Products:				
Aggregate value.....	\$165,131,670	\$38,173,276	\$90,168,236	\$36,790,158
Smelting:				
Total value.....	\$54,275,178	\$38,173,276		\$16,101,897
Fine copper contents of blister or anodes:				
Pounds.....	197,056,734	88,263,325		108,793,409
Value.....	\$25,893,917	\$11,623,280		\$14,230,637
Fine copper contents of matte:				
Pounds.....	137,622,709	137,859,799		262,910
Value.....	\$17,511,130	\$17,472,588		\$38,542
Silver:				
Fine ounces.....	8,866,472	5,995,892		2,870,580
Value.....	\$5,020,050	\$3,463,235		\$1,556,815
Gold:				
Fine ounces.....	300,914	287,116		13,798
Value.....	\$5,890,076	\$5,614,173		\$276,903
Refining:				
Total value.....	\$107,635,247		\$88,620,626	\$19,014,621
Ingots, wire, bars, etc.:				
Pounds.....	602,555,113		475,930,645	126,661,468
Value.....	\$91,061,667		\$77,021,103	\$17,040,564
Blue vitriol:				
Pounds.....	27,298,926		26,017,613	1,281,313
Value.....	\$1,225,745		\$1,178,208	\$47,537
Silver:				
Fine ounces.....	13,220,911		10,203,023	3,026,888
Value.....	\$7,790,985		\$6,076,707	\$1,714,278
Gold:				
Fine ounces.....	224,352		213,740	10,612
Value.....	\$4,656,850		\$4,344,608	\$212,242
All other products, value.....	\$3,221,250		\$1,547,610	\$1,673,640

It appears from Table 24 that of the total capital, \$53,063,395, invested in copper smelting and refining, \$19,375,065, or 36.5 per cent, was invested in plants devoted exclusively to smelting; \$12,166,962, or 22.9 per cent, in plants devoted to refining; and \$21,521,368, or 40.6 per cent, in those engaged in both branches of the industry. The average investment per establishment for the three classes, in the order named, is as follows: \$717,595, \$811,131, and \$4,304,274. The average value of products per establishment is as follows: \$1,413,825, \$6,011,216, and \$7,358,032; the largest plants, therefore, are those in which both branches of the industry are carried on.

As previously explained, the items of expense shown in

the census reports do not cover all the expenses of the establishments reported, no cognizance being taken of the cost of selling the product, of mercantile losses incurred, or of depreciation in plant; nevertheless, the items reported bear a certain relation to each other and to the total for the United States, according to the branch of the industry in which the establishment is engaged. For instance, in establishments engaged in smelting exclusively, the proportional expenditure for labor will be larger, and for materials less, than in establishments engaged exclusively in refining. Table 25 shows the items of expense and the percentage which each is of the total for the establishments included in each of the 3 groups given in Table 24.

TABLE 25.—SALARIES, WAGES, MISCELLANEOUS EXPENSES, AND MATERIALS FOR ESTABLISHMENTS CLASSIFIED ACCORDING TO PROCESS EMPLOYED.

	ALL ESTABLISHMENTS.		SMELTING.		REFINING.		SMELTING AND REFINING.	
	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.	Amount.	Per cent of total.
Total.....	\$133,180,380	100.0	\$23,191,916	100.0	\$82,857,593	100.0	\$27,100,931	100.0
Salaries.....	954,905	0.7	485,784	1.9	335,526	0.4	188,595	0.7
Wages.....	8,529,021	6.4	3,576,429	15.4	1,895,705	2.3	3,056,887	11.3
Miscellaneous expenses.....	1,522,325	1.2	621,573	2.7	388,243	0.5	512,509	1.8
Materials.....	122,174,129	91.7	18,558,130	80.0	80,268,050	96.8	23,347,940	86.2

The detailed statistics for the industry as reported at the census of 1900 are shown in Table 26. This table presents separate totals for each state in which there were 3 or more establishments, and groups the statistics for other

states so as not to disclose the operations of individual establishments. The establishments are also classified according to ownership, which shows that 1 was owned by an individual, 3 by firms or partnerships, and 43 by cor-

porations. The employees are classified so as to show for salaried officials and wage-earners separately the number, salaries, and wages of men, women, and children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals are shown for the different materials and products of smelting and refining, respectively, and also the amounts received

for contract work on the different classes of products, but, as previously explained, the quantities and values of the ores smelted or refined on contract are included in the quantities and values of the materials and products. The number of engines, water wheels, etc., and their horsepower are presented, and the 47 establishments are grouped according to the number of employees in each.

TABLE 26.—COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899.

	United States.	Arizona.	California.	Colorado.	Michigan.	Montana.	New Jersey.	All other states and territories. ¹
Number of establishments	47	9	3	3	8	7	7	15
Character of organization:								
Individual	1							1
Firm and limited partnership	3	1	1				1	
Incorporated company	43	8	2	3	8	7	6	14
Established during the decade	23	5	2	2	1	1	3	9
Established during the census year	4							4
Capital:								
Total	\$58,063,895	\$7,285,659	\$1,114,832	\$2,308,809	\$1,523,407	\$26,824,298	\$6,943,886	\$7,082,954
Land	\$2,091,415	\$122,266	\$11,500	\$99,993	\$85,000	\$309,846	\$84,154	\$659,151
Buildings	\$15,670,959	\$965,024	\$278,734	\$628,885	\$1,086,107	\$9,195,523	\$1,608,545	\$1,948,198
Machinery, tools, and implements	\$5,771,389	\$515,937	\$181,815	\$423,233	\$190,307	\$2,849,499	\$970,991	\$1,177,572
Cash and sundries	\$20,529,682	\$6,662,432	\$692,803	\$1,155,183	\$195,993	\$14,969,927	\$8,550,196	\$3,303,098
Proprietors and firm members	4				1		2	1
Salaried officials, clerks, etc.:								
Total number	488	80	21	30	17	107	74	159
Total salaries	\$954,905	\$140,621	\$25,357	\$59,765	\$25,500	\$233,711	\$138,728	\$331,228
Officers of corporations:								
Number	64	19	3	3		7	10	22
Salaries	\$308,975	\$38,238	\$1,490	\$7,700		\$69,500	\$60,880	\$131,122
General superintendents, managers, clerks, and salesmen:								
Total number	424	61	18	27	17	100	64	137
Total salaries	\$645,930	\$102,388	\$23,867	\$52,065	\$25,500	\$164,211	\$77,848	\$200,101
Men:								
Number	410	61	18	27	17	95	61	131
Salaries	\$632,118	\$102,388	\$23,867	\$52,065	\$25,500	\$159,531	\$76,868	\$192,949
Women:								
Number	14					5	3	6
Salaries	\$13,812					\$4,680	\$1,980	\$7,152
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	13,624	1,988	447	486	514	5,303	2,103	2,783
Least number employed at any one time during the year	9,527	1,404	335	320	410	3,662	1,275	2,181
Average number	11,324	1,648	381	410	462	4,290	1,707	2,426
Wages	\$8,529,021	\$1,276,739	\$342,491	\$315,958	\$364,647	\$3,791,983	\$915,112	\$1,522,091
Men, 16 years and over:								
Average number	11,272	1,648	381	410	462	4,258	1,705	2,408
Wages	\$8,509,895	\$1,276,739	\$342,491	\$315,958	\$364,647	\$3,777,328	\$914,812	\$1,517,920
Women, 16 years and over:								
Average number	4					4		
Wages	\$2,500					\$2,500		
Children, under 16 years:								
Average number	48					29	2	18
Wages	\$16,626					\$12,155	\$300	\$4,171
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over:								
January	10,735	1,632	370	422	469	4,148	1,338	2,356
February	10,591	1,637	429	411	445	4,004	1,349	2,316
March	10,794	1,669	377	434	446	4,049	1,477	2,342
April	10,444	1,612	379	371	450	3,814	1,592	2,256
May	11,492	1,748	344	344	420	4,520	1,631	2,476
June	11,530	1,743	341	241	430	4,635	1,716	2,424
July	11,292	1,699	341	440	452	4,143	1,773	2,354
August	11,470	1,619	352	441	465	4,340	1,371	2,382
September	11,559	1,607	398	482	479	4,301	1,860	2,432
October	11,096	1,631	409	455	505	4,223	1,908	2,563
November	11,753	1,561	446	457	493	4,410	1,926	2,460
December	12,005	1,618	384	456	482	4,511	2,013	2,511
Women, 16 years and over:								
January	4					4		
February	4					4		
March	4					4		
April	4					4		
May	4					4		
June	4					4		
July	4					4		
August	4					4		
September	4					4		
October	5					5		
November	4					4		
December	4					4		
Children, under 16 years:								
January	50					28		22
February	47					26		21
March	51					29		22
April	42					22		20
May	50					29		21
June	47					28		19
July	52					32	3	17
August	48					28	3	17
September	48					28	3	17
October	45					25	3	17
November	44					26	3	9
December	42					32	3	13

¹ Includes establishments distributed as follows: Connecticut, 2; Illinois, 1; Maryland, 1; Nevada, 1; New Mexico, 1; New York, 2; Ohio, 1; South Dakota, 1; Tennessee, 1; Utah, 2; Virginia, 1; Washington, 1.

TABLE 26.—COPPER SMELTING AND REFINING, BY STATES AND TERRITORIES: 1899—Continued.

	United States.	Arizona.	California.	Colorado.	Michigan.	Montana.	New Jersey.	All other States and territories. ¹
Miscellaneous expenses:								
Total	\$1,522,825	\$266,548	\$90,026	\$11,547	\$33,685	\$556,852	\$290,423	\$278,244
Rent of works	\$32,900					\$25,000	\$1,500	\$6,400
Taxes, not including internal revenue	\$215,242	\$30,036	\$4,229	\$6,878	\$6,705	\$128,005	\$10,030	\$29,309
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	\$1,228,603	\$236,512	\$85,797	\$8,991	\$26,980	\$388,945	\$248,848	\$237,585
Contract work	\$45,680			\$678		\$14,902		
Materials used:								
Total cost	\$122,174,129	\$6,870,884	\$1,879,423	\$3,385,113	\$16,754,220	\$20,556,336	\$32,545,179	\$41,182,974
Ores:								
Tons	4,039,815	752,642	223,251	159,729		2,442,636	3,766	457,201
Cost	\$25,190,522	\$3,426,054	\$778,452	\$3,070,825		\$14,458,393	\$127,004	\$3,329,789
Matte purchased:								
Tons	48,182	1,413	20			2,795	29,778	14,176
Cost	\$10,613,431	\$180,935	\$3,825			\$611,834	\$6,706,875	\$3,050,162
Blister "mineral" or anodes purchased:								
Tons	284,020				83,852		72,867	127,301
Cost	\$72,401,054				\$16,501,529		\$22,796,489	\$38,103,636
Fuel	\$5,615,465	\$2,109,832	\$551,499	\$223,621	\$127,480	\$1,342,396	\$400,396	\$709,741
Rent of power and heat	\$18,961		\$360			\$18,076		\$525
Mill supplies	\$947,279	\$294,196	\$9,942	\$25,185	\$5,270	\$334,047	\$62,783	\$215,903
All other materials	\$1,766,604	\$238,509	\$32,500	\$65,529	\$119,941	\$1,390,041	\$2,391,132	\$528,952
Freight	\$2,720,213	\$171,958	\$3,045			\$2,401,544		\$144,266
Products:								
Aggregate value	\$165,131,670	\$17,286,517	\$4,508,259	\$3,898,084	\$17,340,041	\$36,387,063	\$38,365,131	\$47,351,625
Smelting:								
Total value	\$54,275,173	\$17,238,980	\$4,508,259	\$3,893,034		\$22,269,979	\$679,000	\$5,685,921
Fine copper contents of blister or anodes:								
Pounds	197,056,794	75,127,116	84,000			112,775,861	2,930,000	6,189,757
Value	\$25,853,917	\$9,663,907	\$12,474			\$14,817,260	\$140,000	\$920,276
Fine copper contents of matte:								
Pounds	137,622,709	52,832,952	25,863,637	21,212,797		24,492,109		13,221,124
Value	\$17,511,130	\$5,801,515	\$3,834,490	\$1,993,791		\$3,254,766		\$1,626,568
Silver:								
Ounces fine	8,866,472	711,373	427,315	723,834		6,032,031	301,800	665,619
Value	\$5,020,050	\$411,016	\$227,035	\$428,493		\$3,412,340	\$170,000	\$371,166
Gold:								
Ounces fine	800,914	18,074	23,323	71,396		45,781	3,453	138,882
Value	\$5,890,076	\$302,542	\$434,250	\$1,470,750		\$785,613	\$69,000	\$2,707,911
Received for contract work	\$293,361		\$280			\$232,404		\$11,217
Refining:								
Total value	\$110,856,497	\$47,537			\$17,340,041	\$14,117,084	\$37,686,131	\$41,665,704
Ingots, wire, bars, etc.:								
Pounds	602,595,113				102,001,189	95,404,468	170,320,925	234,862,581
Value	\$94,001,667				\$17,340,011	\$12,190,564	\$27,432,692	\$37,098,410
Blue vitriol:								
Pounds	27,298,926	1,281,313					1,818,272	24,199,341
Value	\$1,226,745	\$47,937					\$91,413	\$1,036,795
Silver:								
Ounces fine	13,229,911					8,026,883	7,504,285	2,608,788
Value	\$7,790,985					\$1,714,273	\$1,536,730	\$1,539,977
Gold:								
Ounces fine	224,352					10,612	150,949	62,701
Value	\$4,556,850					\$212,242	\$3,038,788	\$1,255,820
All other products	\$3,221,250						\$2,536,548	\$634,702
Received for contract work	\$3,452,855				\$346,287		\$1,035,654	\$2,070,914
Power:								
Number of establishments reporting	47	9	3	3	3	7	7	15
Total horsepower, owned	66,242	6,211	1,620	1,065	930	34,350	8,952	18,214
Engines:								
Steam:								
Number	396	58	12	15	15	177	31	88
Horsepower	48,126	5,285	1,182	825	870	20,200	8,320	11,444
Gas or gasoline:								
Number	8	6	1					1
Horsepower	337	326	3					8
Water wheels:								
Number	29	2	4	1	4	15		3
Horsepower	9,467	120	335	120	60	8,750		32
Electric motors:								
Number	212	23		3		68	53	55
Horsepower	4,612	430		120		1,700	632	1,680
Other power, horsepower	3,700					3,700		
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	47	9	3	3	3	7	7	15
5 to 20	1							1
21 to 50	8	2	2				1	3
51 to 100	7	3		1	1			2
101 to 250	15	1		1	2	1	4	7
251 to 500	8	3	1	1		3		
501 to 1,000	6	1				1	2	2
Over 1,000	2					2		

¹ Includes establishments distributed as follows: Connecticut, 2; Illinois, 1; Maryland, 1; Nevada, 1; New Mexico, 1; New York, 2; Ohio, 1; South Dakota, 1; Tennessee, 1; Utah, 2; Virginia, 1; Washington, 1.

ZINC SMELTING.

The zinc smelting industry has grown very rapidly in recent years, an almost constant annual increase having been maintained from the earliest development of the industry. During the census year ending May 31, 1880, the production of spelter was 23,230 short tons. The census statistics for 1890, which cover the calendar year

1889, revealed an increase to 58,860 short tons. During the last decade the output has again more than doubled, reaching a total of 131,546 short tons during the calendar year 1899, this including the production of sheet zinc.

Table 27 is a summary by states of the statistics reported under the general heads of the inquiry.

TABLE 27.—ZINC SMELTING: SUMMARY FOR THE UNITED STATES.

	United States.	Illinois.	Indiana.	Kansas.	Missouri.	Pennsylvania.	All other states. ¹
Number of establishments	31	5	3	11	5	3	4
Capital	\$14,141,810	\$3,186,319	\$14,885	\$5,218,529	\$804,023	\$1,871,626	\$2,916,472
Land	\$2,248,876	\$138,100	\$7,250	\$1,684,026	\$25,500	\$59,000	\$330,000
Buildings	\$5,470,690	\$637,434	\$108,454	\$2,206,732	\$288,000	\$1,150,000	\$1,080,000
Machinery, tools, and implements	\$1,035,764	\$1,095,041	\$21,000	\$105,461	\$77,800	\$190,000	\$146,250
Cash and sundries	\$1,491,690	\$1,315,744	\$7,441	\$922,337	\$413,229	\$172,626	\$1,330,213
Salaried officials, clerks, etc., number	208	80	8	40	17	9	54
Salaries	\$440,200	\$222,022	\$7,650	\$60,800	\$36,880	\$18,609	\$30,179
Wage-earners, average number	4,869	1,651	119	1,487	500	448	761
Total wages	\$2,355,921	\$758,912	\$58,138	\$705,893	\$268,196	\$171,513	\$300,362
Miscellaneous expenses	\$399,472	\$109,407	\$5,588	\$81,169	\$36,903	\$1,865	\$161,585
Cost of materials used	\$13,286,058	\$1,416,815	\$387,399	\$1,678,946	\$1,651,327	\$306,192	\$1,258,819
Value of products	\$18,188,498	\$5,882,746	\$415,643	\$5,790,144	\$2,011,724	\$1,521,307	\$2,536,934

¹ Includes establishments distributed as follows: New Jersey, 2; Virginia, 1; Wisconsin, 1.

The products of the metallurgy of zinc in the United States have become so varied and are so interlaced that it is impossible to present separately the statistics relating to spelter, to the rolling of sheet zinc, and to the manufacture of zinc white from the ore. In Table 27 the total value of the products is given. In addition to the 31 active establishments shown in the foregoing table, there were 2 idle establishments with a capital of \$59,500; 1 located in Kansas and 1 in Virginia.

Table 28 presents separately the statistics of establishments east and west of the Mississippi River.

TABLE 28.—ZINC SMELTING ESTABLISHMENTS, BY LOCATION, EAST AND WEST OF THE MISSISSIPPI RIVER.

	Total.	East of the Mississippi.	West of the Mississippi.
Number of establishments	31	15	16
Capital	\$14,141,810	\$8,119,252	\$6,022,558
Salaried officials, clerks, etc., number	208	151	57
Salaries	\$440,200	\$342,520	\$97,680
Wage-earners, average number	4,869	2,832	1,987
Total wages	\$2,355,921	\$1,381,922	\$978,999
Miscellaneous expenses	\$399,472	\$281,400	\$118,072
Materials used:			
Total cost	\$13,286,058	\$6,955,725	\$6,330,333
Ore:			
Short tons	463,609	289,618	173,991
Cost	\$10,995,546	\$5,174,545	\$5,821,298
Dross:			
Short tons	12,578	12,578	—
Cost	\$644,645	\$644,645	—
All other materials	\$1,646,867	\$1,136,532	\$510,335
Products:			
Total value	\$18,188,498	\$10,386,630	\$7,801,868
Spelter:			
Pounds	227,646,314	\$2,401,099	145,245,215
Value	\$12,948,036	\$4,546,108	\$7,801,868
Zinc oxide:			
Pounds	75,114,904	75,114,904	—
Value	\$2,718,700	\$2,718,700	—
Sheet zinc:			
Pounds	35,445,374	35,445,374	—
Value	\$2,495,830	\$2,495,830	—
Sulphuric acid:			
Pounds	117,655,214	117,655,214	—
Value	\$424,670	\$424,670	—
All other products, value	\$201,712	\$201,712	—

Table 28 shows that while the greater tonnage of spelter is made west of the Mississippi River, the total value of all products is greater in the territory east of the Mississippi.

Table 29 shows the statistics of zinc smelting by groups of states, Illinois, Indiana, Kansas, Missouri, and Wisconsin comprising one group, and New Jersey, Pennsylvania, and Virginia the other.

TABLE 29.—ZINC SMELTING ESTABLISHMENTS ARRANGED ACCORDING TO LOCATION.

	Total.	Illinois, Indiana, Kansas, Missouri, and Wisconsin.	New Jersey, Pennsylvania, and Virginia.
Number of establishments	31	25	6
Capital	\$14,141,810	\$9,948,712	\$4,193,098
Salaried officials, clerks, etc., number	208	159	48
Salaries	\$440,200	\$351,532	\$88,668
Wage-earners, average number	4,869	3,789	1,080
Total wages	\$2,355,921	\$1,649,663	\$706,258
Miscellaneous expenses	\$399,472	\$242,147	\$157,325
Materials used:			
Total cost	\$13,286,058	\$11,436,748	\$1,799,815
Ore:			
Short tons	463,609	350,150	103,459
Cost	\$10,995,546	\$10,106,027	\$889,819
Dross:			
Short tons	12,578	2,427	10,151
Cost	\$644,645	\$124,340	\$520,305
All other materials	\$1,646,867	\$1,256,376	\$389,191
Products:			
Total value	\$18,188,498	\$14,636,168	\$3,552,330
Spelter:			
Pounds	227,646,314	210,035,575	17,610,739
Value	\$12,948,036	\$11,151,891	\$1,796,145
Zinc oxide:			
Pounds	75,114,904	14,879,750	60,235,154
Value	\$2,718,700	\$505,911	\$2,212,789
Sheet zinc:			
Pounds	35,445,374	35,445,374	—
Value	\$2,495,830	\$2,495,830	—
Sulphuric acid:			
Pounds	117,655,214	117,655,214	—
Value	\$424,670	\$424,670	—
All other products, value	\$201,712	\$58,316	\$143,396

The zinc industry of the United States is naturally divided into two main groups, represented in Table 29.

The first includes the works of Illinois, Indiana, Kansas, Missouri, and Wisconsin, and is dependent almost exclusively upon the ores mined in the Mississippi Valley, all the works purchasing their ores in the open market. The second group includes the works of Pennsylvania, New Jersey, and Virginia, which control nearly the whole of their own ore supply. While the western works make only what is known as common spelter, the eastern plants produce a special grade which commands a higher price at home and abroad. The first group reports the actual price paid for ore in the open market, while the latter can not do more than place upon the raw material consumed an arbitrary estimate of its cost at the smelter.

Table 30 is a comparative statement for the United States of statistics reported for 1889¹ and 1899, with the percentages of increase of 1899 over 1889.

TABLE 30.—ZINC SMELTING: COMPARATIVE SUMMARY FOR THE UNITED STATES, 1889 AND 1899, WITH PER CENT OF INCREASE.

	1899	1889	Per cent of increase.
Number of establishments	81	21	47.6
Capital, total value	\$14,141,810	\$4,469,386	216.4
Land	\$2,243,876	\$618,000	266.0
Buildings	\$3,470,590	\$2,019,915	170.8
Machinery, tools, and implements	\$1,985,754	\$975,856	98.4
Cash and sundries	\$4,491,590	\$860,615	421.9
Salaried officials, clerks, etc., number	4,208	95	118.9
Salaries	\$140,200	\$140,280	213.8
Wage-earners, average number	4,869	2,690	81.0
Total wages	\$2,855,921	\$1,424,981	65.3
Miscellaneous expenses	\$399,472	\$228,232	76.6
Materials used:			
Total cost	\$13,286,058	\$4,807,710	176.3
Ore:			
Short tons	463,609	196,809	136.2
Cost	\$10,995,846	\$4,154,404	164.7
All other materials, cost	\$2,290,212	\$653,306	250.6
Products:			
Spelter, short tons	1181,546	158,860	123.5
Zinc oxide, short tons	37,557	16,970	121.3

¹ Includes sheet zinc manufactured at smelter.

The statistics for 1889 in Table 30 are taken from the Eleventh Census report on Mines and Mining, the data in the report for manufactures being too incomplete for purposes of comparison.

The methods of inquiry employed at the two census periods differed in several particulars, and the foregoing table presents as accurate a comparison of the items common to both censuses as it is possible to make from the results obtained.

It is a noteworthy fact that the capital invested has increased largely during the decade which has elapsed. This is principally due to the development of collateral industries like the rolling of sheet zinc, which increased from 9,889 short tons in 1889 to 17,723 short tons in 1899, and to the introduction since 1889 of the manufacture of sulphuric acid and acid phosphate, two products which are the result of utilizing sulphurous acid made in roasting blende.

¹ Report on Mineral Industries, Eleventh Census, page 174.

In 1899 there were produced 58,828 tons of sulphuric acid and 7,512 tons of acid phosphate.

The capital account of zinc smelting works has also been increased materially by the adoption of improved appliances, notably by the automatic calcining furnaces which have been successfully introduced in recent years.

Geographically, the industry has shifted considerably. Kansas, which stood second in 1889, with a product of 13,658 net tons of spelter, has risen to first rank, with a production of 54,516 short tons in 1899. Illinois, with a joint production of spelter and of sheet zinc of 23,860 short tons in 1889, has fallen to second place in 1899, with 45,759 short tons of spelter and sheet zinc. Indiana, which was not a spelter producing state in 1889, has become the seat of several plants as the result of the manufacturing advantages following the discovery of natural gas.

An interesting and significant movement has taken place in recent years in the districts close to the famous Joplin-Galena ore fields. Before the discovery of the Kansas natural gas belt the ores were worked at plants located either in the immediate vicinity of the ore mines, or in the Kansas coal field, or close to coal in the Chicago district, or finally at the principal primary market for the metal, St. Louis. A very rapid change followed the successful drilling for natural gas at Iola, Cherryvale, and adjacent points in Kansas, large works being located in this district to take advantage of the cheap and metallurgically advantageous fuel. Of course, being modern, they embody the experience of men long identified with the industry, and familiar with local conditions. The disadvantages under which the older works labor have been further emphasized by forced intermittent work. Therefore, the mere change of fuel does not account for the entire difference in results shown. The following statistics, compiled from a number of the individual reports, give numerical expression to these facts:

Zinc Works Using Natural Gas.

	Spelter produced, short tons.	Wages per short ton.	Fuel per short ton.
Kansas belt	40,125	\$12.03	\$1.38
Indiana belt	4,359	13.34	2.99

Zinc Works Using Coal.

	Spelter produced, short tons.	Wages per short ton.	Fuel per short ton.
Kansas and southwestern Missouri	24,219	\$15.53	\$4.19
St. Louis district	14,151	14.06	5.68

It is impossible to present in this statement the figures for the Chicago district, including LaSalle and Peru, Ill., because the majority of the plants manufacture a number of other products.

It will be observed that for the Kansas works using gas the fuel cost of spelter is very low; that in the Indiana

belt it is higher; that the local fuel of the Kansas-Missouri plants using coal permits of somewhat cheaper work than that of the local coals of the St. Louis district. The latter, of course, pay for a relatively long haul on the ore, but as an offset against this is their location at the most important market for spelter and greater proximity to the consumer.

The higher labor cost of the Kansas and Missouri coal plants as compared with that of the works in the Kansas natural gas belt is readily explained by the fact that all the latter plants are modern, while many of the former are old and some of them antiquated.

A striking fact in connection with the condition of the zinc smelting industry is the enormous rise in prices of ore which took place, for a brief period, in the year 1899, which thus represents exceptional conditions. The price for zinc ore of standard quality in the bins at the mine reached \$55 per short ton in May, and the average price for the year was \$38.50 against \$28.44 in 1898 and \$22.28 in 1897. The returns from the smelters in Kansas, Missouri, Illinois, Wisconsin, and Indiana show that the cost to them of the 300,150 tons of zinc ore smelted in 1899 was \$33.67 per ton, which, however, includes the freight to distant plants. In the census year 1889, in the same districts, 128,716 tons of ore treated averaged \$26.59 per ton. This, in both cases, includes the silicate, ores which sell on a different basis than the blende, relatively far the most important quantity smelted. The rapid fluctuations in the price of ores and the high average range of value have made the year 1899 an abnormal one.

Table 31 shows the quantities of the several products manufactured by states and for the United States.

TABLE 31.—PRODUCTS BY STATES.

STATES.	Spelter.	Zinc oxide.	Sheet zinc.	Sulphuric acid.
United States	Pounds. 227,646,814	Pounds. 75,114,904	Pounds. 85,445,374	Pounds. 117,655,214
Illinois	56,071,801		35,445,374	117,655,214
Indiana	8,718,562			
Kansas	109,031,632			
Missouri	36,213,583			
New Jersey		40,946,186		
Pennsylvania	9,562,852	19,288,968		
Virginia	8,047,884			
Wisconsin		14,879,750		

The total production of zinc metal in the United States, obtained by adding the output of spelter, shown in Table 31, to that of sheet zinc, is 263,091,688 pounds, or 131,546 tons.

The detailed statistics for the industry as reported are shown in Table 32. This table presents separate totals for each state in which there were 3 or more establishments, and groups the statistics for other states so as not to disclose the operations of individual establishments. The establishments are classified according to the character of the ownership, which shows that 3 were owned by individuals, 2 by partnerships, and 26 by corporations. The employees are segregated so as to show for salaried officers and wage-earners separately the number and salaries or wages of men, women, and children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals of the different materials and products are shown. The number of engines and electric motors in use and their horsepower are presented, and the 31 establishments are grouped according to the number of employees in each.

TABLE 32.—ZINC SMELTING, BY STATES.

	United States.	Illinois.	Indiana.	Kansas.	Missouri.	Pennsylvania.	All other states. ¹
Number of establishments	31	5	3	11	5	3	4
Character of organization:							
Individual	3		1	1	1		
Firm and limited partnership	2			2			
Incorporated company	26	5	2	8	4	3	4
Established during the decade	19	2	2	10	3	2	
Established during the census year	3			2		1	
Capital:							
Total	\$14,141,810	\$3,186,819	\$144,835	\$5,218,529	\$804,029	\$1,871,626	\$2,916,472
Land	\$2,243,876	\$138,100	\$7,250	\$1,684,026	\$25,500	\$59,000	\$330,000
Buildings	\$5,470,590	\$637,484	\$108,454	\$2,206,702	\$288,000	\$1,150,000	\$1,080,000
Machinery, tools, and implements	\$1,935,754	\$1,095,041	\$21,690	\$405,464	\$77,300	\$190,000	\$146,259
Cash and sundries	\$4,491,590	\$1,315,744	\$7,441	\$922,337	\$413,229	\$472,626	\$1,360,213
Proprietors and firm members	4		1	2			
Salaried officials, clerks, etc.:							
Total number	208	80	8	40	17	9	54
Total salaries	\$440,200	\$222,022	\$7,650	\$60,800	\$36,880	\$13,669	\$99,179
Officers of corporations:							
Number	41	11	4	3	3		20
Salaries	\$193,275	\$92,775	\$4,800	\$18,400	\$20,800		\$56,500
General superintendents, managers, clerks, and salesmen:							
Total number	167	69	4	37	14	9	34
Total salaries	\$246,925	\$120,247	\$2,850	\$12,400	\$16,080	\$13,669	\$42,679
Men:							
Number	168	68	8	37	14	9	32
Salaries	\$245,521	\$128,623	\$2,550	\$12,400	\$16,080	\$13,669	\$42,199
Women:							
Number	4	1	1				2
Salaries	\$1,404	\$624	\$300				\$480
Wage-earners, including pieceworkers, and total wages:							
Greatest number employed at any one time during the year	5,944	1,641	190	1,958	537	751	867
Least number employed at any one time during the year	4,473	1,476	140	1,186	433	593	645
Average number	4,869	1,551	119	1,437	500	448	764
Wages	\$2,356,921	\$758,912	\$58,138	\$705,803	\$268,196	\$174,510	\$390,362
Men, 16 years and over:							
Average number	4,843	1,593	119	1,485	500	448	753
Wages	\$2,348,338	\$754,698	\$58,138	\$704,903	\$268,196	\$174,510	\$387,993
Women, 16 years and over:							
Average number	8			2			6
Wages	\$3,369			\$900			\$2,469
Children, under 16 years:							
Average number	18	18					
Wages	\$4,214	\$4,214					

¹ Includes establishments distributed as follows: New Jersey, 2; Virginia, 1; Wisconsin, 1.

TABLE 32.—ZINC SMELTING, BY STATES—Continued.

	United States.	Illinois.	Indiana.	Kansas.	Missouri.	Pennsylvania.	All other states. ¹
Average number of wage-earners, including pieceworkers, employed during each month:							
Men, 16 years and over:							
January	4,559	1,491	92	1,426	517	383	650
February	4,764	1,510	102	1,532	532	373	710
March	5,035	1,533	107	1,732	530	385	748
April	5,012	1,535	109	1,726	524	382	736
May	5,138	1,546	104	1,762	535	392	739
June	5,120	1,540	190	1,740	501	407	742
July	5,022	1,561	182	1,626	489	432	732
August	4,829	1,580	152	1,380	477	446	764
September	4,728	1,565	145	1,331	474	417	796
October	4,548	1,542	87	1,221	467	404	827
November	4,674	1,488	33	1,147	470	711	825
December	4,687	1,500	31	1,202	487	642	825
Women, 16 years and over:							
January	7			2			5
February	7			2			5
March	7			2			5
April	7			2			5
May	7			2			5
June	8			2			6
July	9			2			7
August	8			2			6
September	9			2			7
October	9			2			7
November	9			2			7
December	9			2			7
Children, under 16 years:							
January	9	9					
February	10	10					
March	11	11					
April	15	15					
May	16	16					
June	13	13					
July	18	18					
August	21	21					
September	25	25					
October	27	27					
November	25	25					
December	26	26					
Miscellaneous expenses:							
Total	\$399,472	\$109,407	\$5,538	\$81,169	\$36,903	\$4,869	\$161,536
Rent of works	\$10,200			\$7,800	\$2,400		
Taxes, not including internal revenue	\$44,481	\$12,038	\$394	\$11,023	\$2,383	\$1,936	\$16,213
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	\$344,791	\$97,374	\$5,194	\$62,346	\$31,620	\$2,934	\$145,323
Materials used:							
Total cost	\$13,286,058	\$4,416,815	\$387,399	\$4,678,946	\$1,651,387	\$396,192	\$1,255,819
Ore:							
Short tons	463,609	92,400	10,359	191,407	42,584	45,627	141,232
Cost	\$10,995,846	\$3,660,958	\$326,691	\$4,317,628	\$1,503,670	\$262,792	\$915,112
Dross:							
Short tons	12,578	2,427				9,569	582
Cost	\$644,645	\$124,340				\$506,242	\$14,663
Fuel	\$751,899	\$261,661	\$3,058	\$129,173	\$93,534	\$66,561	\$192,822
Rent of power and heat	\$75,000			\$75,000			
Mill supplies	\$33,845	\$24,977	\$1,145	\$10,452	\$2,412	\$14,962	\$29,867
All other materials	\$436,378	\$205,538	\$9,836	\$41,103	\$33,871	\$45,605	\$103,425
Freight	\$238,505	\$130,346	\$44,669	\$105,590	\$17,900		
Products:							
Total value	\$18,188,498	\$5,882,746	\$445,643	\$5,790,144	\$2,011,724	\$1,521,807	\$2,536,934
Spelter:							
Pounds	227,646,314	56,071,801	8,718,582	109,031,632	36,213,583	9,562,852	3,047,884
Value	\$12,848,036	\$2,904,330	\$145,643	\$3,790,144	\$2,011,724	\$660,598	\$535,547
Zinc oxide:							
Pounds	75,114,904					19,288,968	55,325,936
Value	\$2,718,700					\$779,672	\$1,939,028
Sheet zinc:							
Pounds	35,445,374	35,445,374					
Value	\$2,495,380	\$2,495,380					
Sulphuric acid:							
Pounds	117,655,214	117,655,214					
Value	\$124,670	\$124,670					
Value of all other products	\$201,712	\$58,316				\$31,037	\$62,369
Power:							
Number of establishments reporting	31	5	3	11	5	3	4
Total horsepower	12,546	3,294	230	2,330	675	3,921	2,096
Owned:							
Engines:							
Steam:							
Number	127	34	3	41	9	26	14
Horsepower	11,095	3,089	220	2,265	560	2,970	1,991
Gas or gasoline:							
Number	4		1	2			1
Horsepower	50		10	85			5
Electric motors:							
Number	60	11		3	5	36	5
Horsepower	1,401	205		30	115	951	100
Establishments classified by number of persons employed, not including proprietors and firm members:							
Total number of establishments	31	5	3	11	5	3	4
21 to 50	1	1					
51 to 100	13	1	3	5	3	1	
101 to 250	11	1		5	2		3
251 to 500	3					2	1
501 to 1,000	3	2		1			

¹ Includes establishments distributed as follows: New Jersey, 2; Virginia, 1; Wisconsin, 1.