

WISCONSIN.

INDUSTRIES IN GENERAL.

General character of the state.—Wisconsin, with a gross area of 56,066 square miles, of which 810 represent water surface, ranks twenty-fifth in size among the states and territories of continental United States. Its population in 1910 was 2,333,860, as compared with 2,069,042 in 1900 and 1,693,330 in 1890. It ranked thirteenth among the 49 states and territories as regards population both in 1910 and in 1900. The density of population of the state was 42.2 per square mile in 1910, the corresponding figure for 1900 being 37.4.

Of the entire population of the state, 43 per cent resided in cities and incorporated towns having a population of 2,500 inhabitants or over, as against 38.2 per cent in 1900.

Milwaukee, with a population of 373,857, is the only city in the state having a population of over 50,000, but 17 cities—Superior, Racine, Oshkosh, La Crosse, Sheboygan, Madison, Green Bay, Kenosha, Fond du Lac, Eau Claire, Appleton, Wausau, Beloit, Marinette, Janesville, Manitowoc, and Ashland—have a population of over 10,000 but less than 50,000. These 18 cities contain 32.3 per cent of the total population of the state, and were credited with 61.8 per cent of the total value of its manufactures in 1909. Only 10.8 per cent of the population of the state in 1909 resided in cities having between 2,500 and 10,000 inhabitants.

Lake Michigan, Lake Superior, and the Mississippi and Fox Rivers, together with the numerous railroads of the state, afford excellent transportation facilities and give communication with all parts of the United States and Canada.

Importance and growth of manufactures.—While Wisconsin is largely an agricultural state, the advance in the relative importance of its manufacturing industries, as measured by value of products, has been marked. In 1849 it ranked nineteenth among the states in this respect, while in 1909 it occupied eighth place. During 1849 the manufacturing industries of the state gave employment to an average of 6,089 wage earners, representing 2 per cent of the total population, as against an average of 182,583 wage earners, or 7.8 per cent of the total population in 1909. During this period the gross value of products per capita of the total population of the state increased from \$30 to \$253. The proportion which the manufactures of Wisconsin represented of the total value of the products of manufacturing industries in the United States was nine-tenths of 1 per cent in 1849, as against 2.9 per cent in 1909.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE.	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	9,721	8,558	7,841	13.6	9.1
Persons engaged in manufactures.....	213,426	173,572	(¹)	23.0	.....
Proprietors and firm members.....	8,556	7,961	(¹)	7.5	.....
Salaried employees.....	22,287	14,220	10,480	56.7	35.7
Wage earners (average number).....	182,583	151,391	137,525	20.6	10.1
Primary horsepower.....	554,179	440,234	364,380	25.9	20.8
Capital.....	\$605,657,000	\$412,647,000	\$286,061,000	46.8	44.3
Expenses.....	525,747,000	359,899,000	283,755,000	46.1	26.8
Services.....	119,642,000	86,970,000	66,189,000	37.6	31.4
Salaries.....	25,737,000	15,498,000	10,493,000	66.1	47.7
Wages.....	93,905,000	71,472,000	55,696,000	31.4	28.3
Materials.....	346,357,000	227,255,000	185,695,000	52.4	22.4
Miscellaneous.....	59,748,000	45,674,000	31,871,000	30.8	43.3
Value of products.....	590,306,000	411,140,000	326,753,000	43.6	25.8
Value added by manufacture (value of products less cost of materials).....	243,949,000	183,885,000	141,058,000	32.7	30.4

¹ Figures not available.

In 1909 the state of Wisconsin had 9,721 manufacturing establishments, which gave employment to an average of 213,426 persons during the year and paid out \$119,642,000 in salaries and wages. Of the persons employed, 182,583 were wage earners.

These establishments turned out products to the

value of \$590,306,000, to produce which materials costing \$346,357,000 were used. The value added by manufacture was thus \$243,949,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication due to the use of the product of one establishment in the industry as the material for another establishment.

Although a few industries predominate greatly in importance, it will be seen from Table II that there is, on the whole, considerable diversity in the manufacturing activities of the state. The most important industries listed in the preceding table, in which they are arranged in the order of the value of products, call for brief consideration.

Lumber and timber products.—This classification embraces logging operations, sawmills, planing mills, and establishments manufacturing wooden packing boxes. Although this industry has decreased in importance during the last decade in consequence of the depletion of the forests of the state, it is still the leading manufacturing industry of Wisconsin, giving employment in 1909 to an average of 34,093 wage earners, or 18.7 per cent of the total number of wage earners employed in the manufacturing industries of the state, and reporting products valued at \$57,969,000, or 9.8 per cent of the total value of the state's manufactures.

Foundry and machine-shop products.—This industry embraces, in addition to the foundries and machine shops, the establishments engaged in the manufacture of gas machines and gas and water meters; hardware; cast-iron and cast-steel pipe; plumbers' supplies; steam fittings and heating apparatus; and structural ironwork. The industry is really of greater importance in the state than is indicated by the statistics, as some machine shops manufactured distinctive products, and, as a result, were assigned to other classifications. In 1909 the industry gave employment to an average of 24,219 wage earners, or 13.3 per cent of the total for all manufacturing industries in Wisconsin, and reported products to the value of \$54,124,000, or 9.2 per cent of the state total.

Butter, cheese, and condensed milk.—This is a flourishing industry in Wisconsin, the value of its products increasing 79.5 per cent from 1904 to 1909 and 49.1 per cent from 1899 to 1904. Of the 2,630 establishments reported in 1909, 853 manufactured butter as their chief product, 1,771 cheese, and 6 condensed milk, as compared with 902 butter factories, 1,454 cheese factories, and 4 condensed-milk establishments in 1904.

Leather, tanned, curried, and finished.—Although the number of tanneries decreased from 42 in 1899 to 32 in 1909, the number of wage earners in the industry increased 43.4 per cent and the value of products 122.5 per cent. This industry has advanced from fifth place among the manufacturing industries of the state in value of products in 1899 to fourth place in 1909.

Malt and malt liquors.—The value of the products of the breweries of Wisconsin increased 12 per cent from 1904 to 1909, and that of the products of the malt establishments 9.8 per cent. Combined, the two classes of establishments gave employment to 5,407

wage earners in 1904 and 5,517 in 1909. In the latter year Wisconsin reported 8.6 per cent of the total value of malt liquors and 25.1 per cent of the total value of malt reported for the United States, ranking third among the states in the production of malt liquors and second in the output of malt.

Flour-mill and gristmill products.—This industry, which ranked sixth among the industries of the state in 1909 as measured by value of products, contributed 5.4 per cent of the value of all manufactured products of Wisconsin in that year. Owing to the comparatively simple processes involved in this industry and the extent to which these processes are carried on by machinery, the value added by manufacture is not commensurate with the gross value of products.

Slaughtering and meat packing.—This classification includes establishments engaged in wholesale slaughtering and meat packing and those engaged in the manufacture of sausage only. From 1904 to 1909 the number of establishments nearly doubled, while the value of products increased 64.3 per cent.

Paper and wood pulp.—In 1909 this industry was sixth in importance in the state when measured by the average number of wage earners employed. The value of the products of the mills in that year was \$25,962,000, an increase of 45.5 per cent over the value reported in 1904.

Furniture and refrigerators.—This industry gave employment to an average of 11,118 wage earners, representing 6.1 per cent of the total employed in all manufacturing industries in the state in 1909. Wisconsin reported 7.8 per cent of the total value of products for the industry for the United States as a whole.

Cars and general shop construction and repairs by steam-railroad companies.—This classification represents the work done in the car shops of steam-railroad companies, and is practically confined to repairs to the rolling stock and equipment. The statistics do not include minor repairs made in round-houses. In 1909 the industry gave employment to an average of 8,994 wage earners, ranking fourth in this respect among the manufacturing industries of the state. The value of work done in 1909 was reported as \$14,332,000.

Boots and shoes, including cut stock and findings.—This is one of the rapidly growing industries of the state. During the decade from 1899 to 1909 there was an increase of 84.6 per cent in the average number of wage earners employed and of 162.1 per cent in value of products.

Automobiles, including bodies and parts.—This industry has developed in Wisconsin almost entirely since 1899. In 1904 there were 6 establishments, with products valued at \$1,875,000, while in 1909 there were 30 establishments, giving employment to an average of 4,298 wage earners and reporting products valued at \$11,440,000.

In addition to the 51 industries presented separately in the preceding table for which products valued at more

than \$500,000 are reported, there are 24 other industries each of which had a value of products in 1909 in excess of this amount.¹ These are included under the head of "All other industries" in the table, in some cases because the operations of individual establishments would be disclosed if they were shown separately; in others, because the returns do not present properly the true condition of the industry, for the reason that it is more or less interwoven with one or more other industries; and in still others, because comparative statistics can not be presented for either 1904 or 1899 without disclosing the operations of individual establishments, or on account of changes in classification. The statistics for 1909, however, for the manufacture of blacking and cleansing and polishing preparations and of brass and bronze products, and for the shipbuilding industry, including boat building, are presented in Table II, page 1356.

The relative importance of the leading industries shown in the preceding table when measured by value added by manufacture differs considerably, on the whole, from their relative importance as measured by value of products, although the lumber and timber products and foundry and machine-shop industries hold first and second place, respectively, on either basis. The brewery industry, however, which ranks fifth in value of products, becomes third in rank according to value added by manufacture; the furniture and refrigerator industry becomes fourth instead of ninth; and printing and publishing seventh instead of twelfth. On the other hand, the butter, cheese, and condensed-milk industry, which is third in value of products, drops to tenth place in value added by manufacture; the flour-mill and gristmill industry becomes thirteenth instead of sixth; and slaughtering and meat packing sixteenth instead of seventh.

The preceding table gives also the percentages of increase for these leading industries in respect to value of products and value added by manufacture in all cases where comparative statistics can be presented. The largest relative increase in value of products from 1904 to 1909 reported for any of the industries shown separately in the table was that of 510.1 per cent for the automobile industry, which includes the manufacture of bodies and parts. This industry also shows an exceptionally large rate of increase in value added by manufacture, 492.2 per cent. The greatest rate of increase in value added by manufacture, however,

¹ These industries are:

Bags, other than paper.
Bags, paper.
Beet sugar.
Blacking and cleansing and polishing preparations.
Boots and shoes, rubber.
Brass and bronze products.
Butter, reworking.
Clothing, horse.
Coffee and spice, roasting and grinding.
Coke.
Enameling and japanning.
Explosives.

Glue.
Hats, straw.
Instruments, professional and scientific.
Liquors, distilled.
Matches.
Mineral and soda waters.
Rubber goods, not elsewhere specified.
Shipbuilding, including boat building.
Soap.
Steam packing.
Windmills.
Wirework, including wire rope and cable.

reported for any of the industries shown in the table was that for the manufacture of pianos and organs and materials, 529.7 per cent. The rate of increase in gross value of products for this industry was also very high, amounting to 385.3 per cent. From 1899 to 1904 the manufacture of fancy articles, not elsewhere specified, showed the greatest rates of increase both in value of products and in value added by manufacture. Other industries which showed remarkable rates of increase both in value of products and in value added by manufacture during the more recent five-year period are the manufacture of artificial stone; dairy-men's, poulterers', and apiarists' supplies; coffins, burial cases, and undertakers' goods; boxes, fancy and paper; gas and electric fixtures and lamps and reflectors; and food preparations.

Of all the different industries for which separate figures are given only the lumber and timber products industry shows a decrease in value of products for both five-year periods. Five other industries, however, show decreases in value of products from 1904 to 1909, and one other a decrease from 1899 to 1904. Ten industries show decreases in value added by manufacture from 1904 to 1909 and three decreases from 1899 to 1904.

Persons engaged in manufacturing industries.—The following table shows, for 1909, the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	213,426	186,350	27,076
Proprietors and officials.....	14,622	14,294	328
Proprietors and firm members.....	8,556	8,327	229
Salaried officers of corporations.....	2,351	2,299	52
Superintendents and managers.....	3,715	3,668	47
Clerks.....	16,221	12,955	3,266
Wage earners (average number).....	182,583	159,101	23,482
16 years of age and over.....	178,316	156,734	21,582
Under 16 years of age.....	4,267	2,367	1,900

The average number of persons engaged in manufactures during 1909 was 213,426, of whom 182,583 were wage earners. Of the remainder, 14,622 were proprietors and officials and 16,221 were clerks. Corresponding figures for individual industries will be found in Table II, page 1356.

The following table shows, for 1909, the percentage of proprietors and officials, clerks, and wage earners, respectively, among the total number of persons

employed in manufactures. It covers all industries combined and 32 important industries individually.

shows, for some of the important industries separately, a similar distribution of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries	213,426	6.9	7.6	85.5
Agricultural implements.....	4,095	3.6	30.3	66.0
Automobiles, including bodies and parts.....	4,647	2.7	4.8	92.5
Boots and shoes, including cut stock and findings.....	5,962	2.4	6.5	91.1
Bread and other bakery products.....	2,719	27.5	8.1	64.4
Brick and tile.....	1,219	13.9	1.8	84.2
Butter, cheese, and condensed milk.....	5,181	40.8	3.7	55.5
Canning and preserving.....	2,044	8.9	4.2	86.9
Carriages and wagons and materials.....	4,044	10.4	4.6	85.0
Cars and general shop construction and repairs by steam-railroad companies.....	9,419	1.6	2.9	95.5
Clothing, men's, including shirts.....	4,841	3.4	8.8	87.3
Confectionery.....	2,262	3.5	17.8	78.7
Cooperage and wooden goods, not elsewhere specified.....	1,315	5.6	2.6	91.9
Copper, tin, and sheet-iron products.....	3,263	6.7	7.8	85.5
Electrical machinery, apparatus, and supplies.....	1,904	6.6	19.4	74.0
Flour-mill and gristmill products.....	1,931	25.1	13.6	61.3
Foundry and machine-shop products.....	28,075	4.2	9.5	86.3
Furniture and refrigerators.....	12,161	2.6	6.0	91.4
Gas, illuminating and heating.....	1,505	12.2	17.1	70.0
Gloves and mittens, leather.....	1,782	2.9	5.0	92.1
Hosiery and knit goods.....	4,669	2.7	5.4	91.9
Iron and steel, steel works and rolling mills.....	2,285	1.8	5.3	93.0
Leather goods.....	2,450	4.0	9.8	85.7
Leather, tanned, curried, and finished.....	7,977	1.3	4.1	94.6
Liquors, malt.....	6,076	6.4	10.3	83.3
Lumber and timber products.....	37,134	5.0	3.2	91.5
Marble and stone work.....	2,398	7.2	3.3	89.5
Paper and wood pulp.....	7,878	2.0	3.2	94.8
Printing and publishing.....	7,800	15.4	16.4	68.2
Slaughtering and meat packing.....	2,263	4.3	12.2	83.5
Stoves and furnaces, including gas and oil stoves.....	2,118	2.2	12.6	85.2
Tobacco manufactures.....	3,380	26.0	3.3	70.7
Woolen, worsted, and felt goods, and wool hats.....	1,178	5.9	5.3	88.8
All other industries.....	26,933	8.4	10.4	81.3

Of the total number of persons engaged in all manufacturing industries, 6.9 per cent were proprietors and officials, 7.6 per cent clerks, and 85.5 per cent wage earners. The highest percentage of proprietors and officials shown for any individual industry, 40.8, is for the establishments engaged in the manufacture of butter, cheese, and condensed milk. In this industry and also in the bakery, flour-mill and gristmill, and tobacco manufacturing industries, the majority of the establishments are small and the work is done to a large extent by the proprietors or their immediate representatives, so that the proportion of the persons engaged in these industries falling in the class of proprietors and officials is very much higher than for most other industries or for all industries combined.

On account of the large average number of wage earners in the steam-railroad repair shops, the steel works and rolling mills, the tanneries, the paper and pulp mills, and the establishments manufacturing stoves and furnaces, these industries show the smallest proportions of proprietors and officials.

The following table shows, for 1909, in percentages, for all industries combined the distribution of the average number of wage earners by age periods, and for those 16 years of age and over by sex, calculated in the manner described in the Introduction. It also

INDUSTRY.	Average number. ¹	WAGE EARNERS.		
		Per cent of total.		
		16 years of age and over.		Under 16 years of age.
		Male.	Female.	
All industries	182,583	85.8	11.8	2.3
Agricultural implements.....	2,704	95.9	1.6	1.5
Automobiles, including bodies and parts.....	4,298	99.1	0.3	0.6
Boots and shoes, including cut stock and findings.....	5,431	57.7	83.7	8.6
Bread and other bakery products.....	1,751	77.3	19.5	3.3
Brick and tile.....	1,027	97.8	0.1	2.1
Butter, cheese, and condensed milk.....	2,863	97.1	2.2	0.7
Canning and preserving.....	1,776	67.9	23.9	3.2
Carriages and wagons and materials.....	3,437	98.5	0.9	0.7
Cars and general shop construction and repairs by steam-railroad companies.....	8,994	99.9	0.1	.....
Clothing, men's, including shirts.....	4,252	22.5	73.3	4.5
Confectionery.....	1,780	25.2	54.8	19.9
Cooperage and wooden goods, not elsewhere specified.....	1,208	98.3	0.8	0.9
Copper, tin, and sheet-iron products.....	2,730	81.8	17.2	1.0
Electrical machinery, apparatus, and supplies.....	1,409	93.5	5.3	0.6
Flour-mill and gristmill products.....	1,184	99.5	0.4	0.1
Foundry and machine-shop products.....	24,219	98.3	0.8	0.9
Furniture and refrigerators.....	11,118	92.0	3.4	3.7
Gas, illuminating and heating.....	1,063	99.2	0.8	.....
Gloves and mittens, leather.....	1,642	31.3	62.9	5.8
Hosiery and knit goods.....	4,282	17.7	71.7	10.6
Iron and steel, steel works and rolling mills.....	2,124	99.7	.....	0.3
Leather goods.....	2,099	71.7	23.6	4.7
Leather, tanned, curried, and finished.....	7,548	95.7	3.9	0.4
Liquors, malt.....	5,061	93.8	6.2	.....
Lumber and timber products.....	34,093	98.0	0.9	1.1
Marble and stone work.....	2,593	100.0	.....	(²)
Paper and wood pulp.....	7,467	87.2	12.6	0.2
Printing and publishing.....	5,360	68.8	25.7	5.5
Slaughtering and meat packing.....	1,890	93.2	5.1	1.6
Stoves and furnaces, including gas and oil stoves.....	1,803	96.9	.....	3.1
Tobacco manufactures.....	2,381	73.1	26.3	0.5
Woolen, worsted, and felt goods, and wool hats.....	1,046	40.5	53.5	5.9
All other industries.....	21,890	76.3	20.1	3.6

¹ For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.
² Less than one-tenth of 1 per cent.

For all industries combined, 85.8 per cent of the average number of wage earners were males 16 years of age and over; 11.8 per cent, females 16 years of age and over; and 2.3 per cent, children under the age of 16. The proportions of women and of children were high in several important industries. In the manufacture of men's clothing, 73.3 per cent of the wage earners were women 16 years of age and over; in the confectionery industry, 54.8 per cent; in leather gloves and mittens, 62.9 per cent; in hosiery and knit goods, 71.7 per cent; and in the manufacture of woolen, worsted, and felt goods, and wool hats, 53.5 per cent. In the confectionery industry 19.9 per cent, and in the hosiery and knitting mills 10.6 per cent, of the wage earners were under 16 years of age.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown at the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The next table makes this comparison according to occupational status.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	213,426	100.0	173,572	100.0	23.0
Proprietors and firm members.....	8,556	4.0	7,961	4.6	7.5
Salaried employees.....	22,287	10.4	14,220	8.2	56.7
Wage earners (average number).....	182,583	85.5	151,391	87.2	20.6

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the number of salaried employees than in the other two classes.

The table in the next column shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

This table indicates that for all industries combined there has been a decrease during the 10 years in the employment of children under 16 years of age, although from 1904 to 1909 the total number of children employed increased slightly. There has been no great change in the proportions of male and female wage earners 16 years of age and over. In 1909 males 16 years of age and over formed 85.8 per cent of all wage

earners, as compared with 85.4 per cent in 1904 and 86 per cent in 1899.

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	182,583	100.0	151,391	100.0	137,525	100.0
16 years of age and over.....	178,316	97.7	147,244	97.3	131,972	96.0
Male.....	156,734	85.8	129,274	85.4	118,332	86.0
Female.....	21,582	11.8	17,970	11.9	13,640	9.9
Under 16 years of age.....	4,267	2.3	4,147	2.7	5,553	4.0

Wage earners employed, by months.—The following table gives the number of wage earners employed on the 15th day of each month during the year 1909 for all industries combined, for the canning and preserving and the lumber and timber products industries, and for all other industries combined; it gives also the percentage which the number reported for each month is of the greatest number reported for any month. In Table II, page 1356, are shown, for practically all of the important industries in the state, the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month. The wage earners for the lumber industry are divided in the table in such a manner as to show separately the number engaged in the mills and in the logging operations.

MONTH.	WAGE EARNERS.											
	All industries.		Canning and preserving.		Lumber and timber products.						All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Total.		In mills.		In logging operations.		Number.	Per cent of maximum.
					Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.		
January.....	174,937	90.9	292	4.5	36,756	96.0	19,631	99.6	17,125	100.0	137,889	88.4
February.....	178,091	92.5	313	4.8	38,284	100.0	21,769	77.2	16,515	96.4	139,494	89.4
March.....	179,007	93.0	332	5.8	36,638	95.6	23,778	84.4	12,810	74.8	142,037	91.0
April.....	173,561	90.1	612	8.3	31,194	81.5	26,061	92.5	5,133	30.0	141,755	90.9
May.....	176,625	91.7	804	13.8	31,955	83.5	27,016	95.8	4,939	28.8	143,766	92.1
June.....	180,691	93.9	1,230	19.5	33,902	88.0	28,186	100.0	5,716	33.4	145,509	93.3
July.....	184,290	95.7	6,560	100.0	32,613	85.2	27,190	96.5	5,423	31.7	145,117	93.0
August.....	185,556	96.4	5,455	83.2	31,859	83.2	20,163	92.8	5,696	33.3	148,242	95.0
September.....	185,582	96.4	2,536	38.7	32,004	83.6	24,978	88.6	7,026	41.0	151,052	96.8
October.....	183,604	98.0	1,363	20.8	33,243	86.8	23,733	84.2	9,510	55.5	154,033	98.7
November.....	191,447	99.4	631	14.2	34,620	91.2	22,140	78.5	12,780	74.6	155,596	99.7
December.....	192,527	100.0	683	10.5	35,815	93.6	20,043	71.1	15,772	92.1	156,024	100.0

Canning and preserving and the lumber and timber industries are the only seasonal industries of importance in Wisconsin. Most of the activity in the canning and preserving industry occurs in July, August, and September, the season when the fruits and vegetables canned reach the proper stage of maturity. The greatest number of wage earners employed in this industry in any one month was 6,560 in July, while the least number, 292, representing but 4.5 per cent of the maximum, was reported for January. In the lumber industry as a whole the number employed in April, the month of least employment, was only 18.5 per cent less than that in February, the month of

greatest employment. The number employed in the logging operations alone varied much more than this, however, the number in May being only 28.8 per cent of the number in January. Employment in the mills was more steady, the number of wage earners in January, the month of least activity, being 69.6 per cent of the number in June, the month of greatest activity. The small variation in the industry as a whole, when compared with the variations in the two branches, is due to the fact that the period of least employment in one branch of the industry is the period of greatest employment in the other branch.

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Prevailing hours of labor.—In the following table wage earners have been classified according to the hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed

during the year is used and the number employed in each establishment is classified as a total according to the hours prevailing in that establishment, even though a few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	182,563	12,057	4,420	20,756	40,010	93,072	5,366	4,732	2,170
Agricultural implements.....	2,704				1,906	798			
Artificial stone.....	377	9	6	35	19	308			
Automobiles, including bodies and parts.....	4,298	4		273	2,121	985		915	
Boots and shoes, including cut stock and findings.....	5,431	3	28	430	1,458	3,512			
Boxes, cigar.....	186	94		22	43	27			
Boxes, fancy and paper.....	824		17	411	76	320			
Bread and other bakery products.....	1,751	60	186	136	27	1,081	198	44	19
Brick and tile.....	1,027		20	18	38	911	40		
Brooms.....	101	6	19	2	18	66			
Brushes.....	142	2		83	45	12			
Butter, cheese, and condensed milk.....	2,863	251	22	68	192	766	1,103	94	367
Buttons.....	188	6		2		180			
Canning and preserving.....	1,776		47	13	125	1,051	217	251	72
Carriages and wagons and materials.....	3,487	8		119	1,241	2,009			
Cars and general shop construction and repairs by steam-railroad companies.....	8,994	124	977	7,120		208	409		96
Chemicals.....	76					76			
Clothing, men's, including shirts.....	4,252	884	89	1,706	1,251	322			
Clothing, women's.....	565	14	44	448		64			
Coffins, burial cases, and undertakers' goods.....	349			6		332	11		
Confectionery.....	1,780	5		350	409	1,016			
Cooperage and wooden goods, not elsewhere specified.....	1,208	219	6	75	137	771			
Copper, tin, and sheet-iron products.....	2,780	318		68	1,054	1,340			
Cutlery and tools, not elsewhere specified.....	118			8	58	52			
Dairymen's, poulterers' and apiarists' supplies.....	526		7	3	28	488			
Electrical machinery, apparatus, and supplies.....	1,409	7	41	351	939	71			
Fancy articles, not elsewhere specified.....	343	4		3	143	193			
Flour-mill and gristmill products.....	1,184	248	5	4	2	837	76	10	2
Food preparations.....	526	1	263	8	60	152	1	41	
Foundry and machine-shop products.....	24,219	44	295	511	14,549	8,816	4		
Fur goods.....	413	56	40	124	32	161			
Furniture and refrigerators.....	11,118	46	20	151	1,121	9,780			
Gas and electric fixtures and lamps and reflectors.....	552	5		171	8	368			
Gas, illuminating and heating.....	1,063	9		14	49	703	35		253
Gloves and mittens, leather.....	1,642	53	64	188	875	462			
Hosiery and knit goods.....	4,282	24	96	920	2,876	366			
Iron and steel, blast furnaces.....	758								758
Iron and steel, steel works and rolling mills.....	2,124	10		10	102	977		1,025	
Jewelry.....	78	3	14	57	4	4			
Leather goods.....	2,099	25	73	321	1,082	594	4		
Leather, tanned, curried, and finished.....	7,548			13	717	6,818			
Lime.....	776	1		9	15	626	120	1	4
Liquors, malt.....	5,061	3,423	2	614	36	913	64	4	5
Lumber and timber products.....	34,083	230	74	808	1,202	31,217	547	9	6
Malt.....	456			50	25	183	186	7	20
Marble and stone work.....	2,593	468	496	903	40	678	8		
Mattresses and spring beds.....	504	61			127	316			
Millinery and lace goods.....	307		41	21		245			
Mirrors.....	87			10	30	47			
Musical instruments, pianos and organs and materials.....	369	2	5		1	361			
Paint and varnish.....	194			33	151	10			
Paper and wood pulp.....	7,467	661				3,195	1,442	2,043	126
Paper goods, not elsewhere specified.....	329			25	120	173	11		
Patent medicines and compounds and druggists' preparations.....	269	106	64	56	3	40			
Photo-engraving.....	171	138	32			1			
Printing and publishing.....	5,360	2,219	744	1,613	333	415	22		14
Slaughtering and meat packing.....	1,890	135		734		1,021			
Stoves and furnaces, including gas and oil stoves.....	1,803		74		941	788			
Tobacco manufactures.....	2,391	1,863	21	173	31	288	15		
Woolen, worsted, and felt goods, and wool hats.....	1,046	2		3	376	665			
All other industries.....	12,306	206	488	1,467	3,778	4,708	893	288	428

More than five-sixths (84.3 per cent) of the wage earners employed in the manufacturing industries of Wisconsin work in establishments where the prevailing hours of labor range from 54 to 60 a week, inclusive, only 9 per cent of the total being employed in establishments where the prevailing hours are less than 54 a week, and only 6.7 per cent in establishments where they are more than 60 a week.

While in many of the larger industries employment is confined mainly to a week of between 54 and 60 hours, the 60-hour week so predominates in a number of the more important industries, including the lumber and timber products, that these are the prevailing hours for more than one-half of the total number of wage earners in all manufacturing industries of the state. For the large majority of the wage earners in

the breweries and the tobacco factories a week of 48 hours or less prevails, while the majority of those in printing and publishing establishments work less than 54 hours a week. For most of those employed in the butter, cheese, and condensed-milk factories and in the blast furnaces, on the other hand, the hours of labor are over 60 a week. The week of over 60 hours is also common in the steel works and rolling mills and in the paper and pulp mills.

Location of establishments.—The next table shows the extent to which the manufactures of Wisconsin are centralized in cities of 10,000 population or over and also the proportions in districts outside of these cities. (See Introduction.)

The population in 1900 was used as a basis in making a classification for 1904 as well as for 1899, but the classification for 1909 was made on the basis of the population in 1910.

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.								DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 to 100,000.		100,000 and over.		Number or amount.	Per cent of total.
			Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.		
Population.....	1910	2,333,860	752,948	32.3	160,061	6.9	219,030	9.4	373,857	16.0	1,580,912	67.7
	1900	2,069,042	599,845	29.0	197,158	9.5	117,372	5.7	285,315	13.8	1,409,197	71.0
Number of establishments.....	1909	9,721	3,330	34.3	688	7.1	878	9.0	1,764	18.1	6,391	65.7
	1904	8,558	2,950	34.5	919	10.7	504	5.9	1,527	17.8	5,608	65.6
	1899	7,841	2,700	34.4	811	10.3	470	6.0	1,419	18.1	5,141	65.6
Average number of wage earners.	1909	182,583	113,062	62.3	24,466	13.4	29,694	16.3	59,502	32.6	63,921	37.7
	1904	151,391	89,009	59.2	30,972	20.5	15,331	10.1	43,366	28.6	61,722	40.8
	1899	137,525	82,056	59.7	25,944	18.9	14,892	10.8	41,220	30.0	55,469	40.3
Value of products.....	1909	\$590,305,538	\$364,736,784	61.8	\$73,322,285	12.4	\$83,090,869	14.1	\$208,323,630	35.3	\$225,568,754	38.2
	1904	411,139,681	249,001,611	60.6	71,398,806	17.4	39,607,840	9.6	137,994,965	33.6	162,138,070	39.4
	1899	326,752,378	194,671,599	59.6	49,548,271	15.2	34,269,226	10.5	110,354,102	33.9	132,081,279	40.4
Value added by manufacture...	1909	243,948,955	158,263,857	64.9	30,451,355	12.5	40,110,295	16.4	87,702,207	36.0	85,685,098	35.1
	1904	183,884,589	117,727,841	64.0	32,176,680	17.5	18,639,629	10.1	66,801,532	36.4	60,156,748	36.0
	1899	141,057,485	88,677,429	62.9	23,127,403	16.4	14,389,564	10.2	51,160,402	36.3	62,380,056	37.1

In 1909, 61.8 per cent of the total value of manufactured products for the state was reported from cities having over 10,000 inhabitants, and 62.3 per cent of the average number of wage earners in manufacturing industries were employed in such cities. The figures indicate that, while very little relative change took place during the 10 years, the manufacturing industries of the cities in question grew somewhat more rapidly than those of the districts outside, although the percentage of manufacturing establishments located outside of such cities was slightly larger in 1909 than in 1899.

Although all of the cities having between 10,000 and 25,000 inhabitants in 1910, except Ashland and Marinette, show decided increases in value of products during the decade, the fact that the population of Green Bay, Madison, and Sheboygan, which were included in this group for 1899, increased to such an extent that for 1909 they fall in the group comprising the cities having between 25,000 and 100,000 inhabitants, has caused a decrease in the relative industrial importance of the former group, and an increase in that of the latter. The percentages of the average number of wage earners and value of products for the state reported from Milwaukee were somewhat larger in 1909 than in 1899, while the percentage of the value added by manufacture was slightly smaller.

Of the total value of products reported for the state in 1909, 12.4 per cent was reported from the 10 cities having between 10,000 and 25,000 inhabitants, 14.1 per cent from the 7 cities having between 25,000 and 100,000 inhabitants, and 35.3 per cent from Milwaukee.

The population in 1910 and 1900 of the 18 cities which had 10,000 inhabitants or over in 1910 is given in the following tabular statement:

CITY.	1910	1900	CITY.	1910	1900
Milwaukee.....	373,857	285,315	Fond du Lac....	18,797	15,110
Superior.....	40,384	31,091	Eau Claire.....	18,310	17,517
Racine.....	38,002	29,102	Appleton.....	16,773	15,085
Oshkosh.....	33,062	28,284	Wausau.....	16,500	12,354
La Crosse.....	30,417	28,895	Beloit.....	15,125	10,436
Sheboygan.....	26,398	22,962	Marinette.....	14,610	16,196
Madison.....	25,631	19,164	Janesville.....	13,894	13,185
Green Bay.....	25,236	18,684	Manitowoc.....	13,027	11,786
Kenosha.....	21,371	11,606	Ashland.....	11,594	13,074

The relative importance in manufactures of each of these 18 cities is shown in the following table, in which the value of products and average number of wage earners are shown separately for 1909, 1904, and 1899:

CITY.	AVERAGE NUMBER OF WAGE EARNERS.			VALUE OF PRODUCTS.		
	1909	1904	1899	1909	1904	1899
Milwaukee ¹	59,502	43,366	41,220	\$208,323,630	\$137,994,965	\$110,354,102
Racine.....	8,381	6,504	6,138	24,672,669	16,458,965	11,676,150
Kenosha.....	6,449	4,354	3,090	23,181,672	12,362,600	7,333,653
Oshkosh ¹	5,773	4,840	4,223	14,739,252	8,652,462	8,080,999
La Crosse.....	3,329	2,644	2,763	14,103,148	8,139,432	7,676,581
Sheboygan ¹	5,988	5,903	4,992	11,209,029	9,751,116	6,906,757
Fond du Lac.....	2,707	2,560	1,520	8,226,908	5,599,606	5,860,742
Appleton.....	2,125	2,436	1,753	6,734,405	6,672,457	3,861,284
Superior.....	1,847	1,343	1,765	6,574,457	6,356,981	6,835,496
Wausau.....	2,092	1,945	1,427	6,286,532	4,644,457	6,380,557
Green Bay.....	2,579	2,111	1,427	6,235,209	4,873,027	2,709,251
Manitowoc.....	1,525	1,321	975	5,938,887	4,427,816	1,935,442
Beloit.....	2,980	2,471	1,845	5,885,601	4,485,224	2,799,637
Eau Claire.....	2,524	1,966	1,753	5,854,733	3,601,558	3,876,386
Madison.....	1,792	1,476	1,305	5,474,105	3,291,143	2,689,019
Janesville.....	1,451	1,348	1,308	5,155,731	3,846,038	3,184,426
Marinette.....	1,491	1,645	2,485	3,303,378	3,693,399	4,411,256
Ashland.....	1,116	1,361	1,812	2,748,438	4,210,865	8,599,861

¹ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

Every city except Marinette and Ashland shows an increase in the value of products from 1904 to 1909, and all but Superior, Eau Claire, and Marinette an increase from 1899 to 1904. The greatest percentage of gain from 1904 to 1909, 87.5, was in Kenosha and the greatest from 1899 to 1904, 128.8, in Manitowoc.

Milwaukee, the largest and most important city in the state, shows an increase of 51 per cent in value of manufactured products and of 37.2 per cent in the average number of wage earners employed in manufacturing industries from 1904 to 1909. The city ranked eleventh among the cities of the United States in value of manufactured products in 1899, twelfth in 1904, and tenth in 1909. It reported 35.3 per cent of the total value of products of the state in 1909 and employed 32.6 per cent of the total number of wage earners. More than one-third of the total value of the foundry and machine-shop products of the state; about three-fifths of the value of products for the leather, brewery, and printing and publishing industries; nine-tenths of that for the fur-goods and the paint and varnish industries; and the entire output of the millinery and lace-goods industry were reported from Milwaukee. The value of the products for the steel works and rolling mills in the state was reported mostly from Milwaukee, but the statistics for the industry for the city can not be shown without disclosing individual operations. In 1909 Milwaukee held first place among the cities of the United States in the value of leather (tanned, curried, and finished), and third place in that of malt liquors brewed.

The paper and pulp mills were by far the most important manufacturing industry of Appleton, contributing 58.7 per cent of the value of all manufactured products of the city. Of the total value of manufactured products for Beloit, the foundries and machine shops contributed 80.4 per cent. The blast furnaces constituted the most important industry of Ashland, while in Eau Claire the lumber and timber products and the paper and wood-pulp industries predominated. The chief industry of Fond du Lac was the tanning, currying, and finishing of leather; in Green Bay the flour mills and gristmills and the paper and pulp mills are most important; and in Janesville the manufacture of agricultural implements is the leading industry. The principal industries in Kenosha were the tanning, currying, and finishing of leather and the manufacture of furniture and refrigerators and of automobiles, including bodies and parts; in La Crosse, flour mills and gristmills and breweries; in Madison, the foundry and machine-shop and the printing and publishing

industries and the manufacture of agricultural implements and of electrical machinery, apparatus, and supplies; in Manitowoc, the malt industry; in Marinette, the lumber and timber products industry; in Oshkosh, the lumber and timber products and the match industries; in Racine, the manufacture of agricultural implements, automobiles, including bodies and parts, and carriages and wagons and materials; in Sheboygan, the manufacture of furniture and refrigerators and the tanning, currying, and finishing of leather; in Superior, flour mills and gristmills; and in Wausau, the lumber and timber products and flour-mill and gristmill industries.

Character of ownership.—The table on the following page has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined, comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for several important industries individually. In order to avoid disclosing the operations of individual concerns it is necessary to omit several important industries from this table and the one following.

The most important distinction shown is that between corporate and all other forms of ownership. The establishments operated by corporations, though constituting only 24.9 per cent of the total number of establishments in 1909, reported 79.8 per cent of the total value of products. In 1904 such establishments constituted 23.1 per cent of the total number and reported 75.6 per cent of the total value of products. The establishments operated by individuals and firms show decreases in their proportions of the total for every item covered by the table, while those under "Other" forms of ownership, which are principally those operated by cooperative associations, have grown in relative importance. In both years corporations controlled about four-fifths of the manufacturing activities of the state, as measured either by average number of wage earners, value of products, or value added by manufacture. Although in only 7 out of the 15 industries shown separately in this table were a majority of the establishments under corporate ownership, the butter, cheese, and condensed-milk industry was the only one in which such establishments did not do the greater part of the business. This latter industry is peculiar in its organization, most of the establishments being operated by individuals or by cooperative associations.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
Hosiery and knit goods, 1909—Continued.					Lumber and timber products—Continued.				
Per cent of total.....	100.0	100.0	100.0	100.0	Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	29.5	0.7	0.5	0.5	Less than \$5,000.....	40.1	2.1	1.0	2.0
\$5,000 and less than \$20,000.....	16.4	2.0	1.4	1.3	\$5,000 and less than \$20,000.....	28.5	5.8	5.1	5.6
\$20,000 and less than \$100,000.....	21.3	10.9	8.0	8.2	\$20,000 and less than \$100,000.....	18.6	17.5	14.8	15.1
\$100,000 and less than \$1,000,000 ¹	32.8	86.4	90.2	90.0	\$100,000 and less than \$1,000,000.....	12.0	60.5	59.8	59.7
Average per establishment.....		70	\$128,580	\$04,866	\$1,000,000 and over.....	0.8	14.1	18.8	17.7
					Average per establishment.....		33	\$56,833	\$31,747
Leather, tanned, curried, and finished, 1909.					Printing and publishing, 1909.				
\$5,000 and less than \$20,000.....	32	7,548	\$44,667,676	\$9,839,091	Less than \$5,000.....	833	5,360	\$11,860,644	\$8,474,588
\$100,000 and less than \$1,000,000.....	8	60	171,551	46,192	\$5,000 and less than \$20,000.....	493	705	1,212,110	934,731
\$1,000,000 and over.....	13	824	5,577,590	1,123,010	\$20,000 and less than \$100,000.....	233	1,231	2,116,030	1,584,241
	11	6,664	38,918,535	8,664,889	\$20,000 and less than \$100,000.....	82	1,014	3,553,981	2,563,239
Per cent of total.....	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	25	1,810	4,978,523	3,892,377
\$5,000 and less than \$20,000.....	25.0	0.8	0.4	0.5	Per cent of total.....	100.0	100.0	100.0	100.0
\$100,000 and less than \$1,000,000.....	40.6	10.9	12.5	11.5	Less than \$5,000.....	59.2	13.2	10.2	11.0
\$1,000,000 and over.....	34.4	88.3	87.1	88.1	\$5,000 and less than \$20,000.....	28.0	23.0	17.8	18.7
Average per establishment.....		236	\$1,395,865	\$307,472	\$20,000 and less than \$100,000.....	9.8	30.1	30.0	30.2
					\$100,000 and less than \$1,000,000.....	3.0	33.8	42.0	40.0
					Average per establishment.....		6	\$14,238	\$10,174
Liquors, malt, 1909.					Slaughtering and meat packing, 1909.				
Less than \$5,000.....	136	5,061	\$32,125,919	\$24,228,235	Less than \$5,000.....	48	1,890	\$27,216,864	\$3,813,429
\$5,000 and less than \$20,000.....	5	4	16,273	10,338	\$5,000 and less than \$20,000.....	11	11	32,508	9,366
\$20,000 and less than \$100,000.....	37	119	430,469	299,072	\$20,000 and less than \$100,000.....	10	22	131,086	32,378
\$100,000 and less than \$1,000,000.....	53	525	2,547,394	1,824,832	\$100,000 and less than \$1,000,000.....	11	43	597,963	115,264
\$1,000,000 and over.....	31	1,167	7,928,183	5,812,795	\$1,000,000 and over.....	12	336	3,204,495	653,015
	5	3,246	21,203,000	16,281,198	Average per establishment.....	4	1,478	23,250,812	3,003,409
Per cent of total.....	100.0	100.0	100.0	100.0	Per cent of total.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	3.7	0.1	(*)	(*)	Less than \$5,000.....	22.9	0.6	0.1	0.2
\$5,000 and less than \$20,000.....	27.2	2.4	1.3	1.2	\$5,000 and less than \$20,000.....	20.8	1.2	0.5	0.8
\$20,000 and less than \$100,000.....	42.6	10.4	7.9	7.5	\$20,000 and less than \$100,000.....	22.9	2.3	2.2	3.0
\$100,000 and less than \$1,000,000.....	22.8	23.1	24.7	24.9	\$100,000 and less than \$1,000,000.....	25.0	17.8	11.8	17.1
\$1,000,000 and over.....	3.7	64.1	66.0	67.2	\$1,000,000 and over.....	8.3	78.2	85.4	78.8
Average per establishment.....		37	\$236,220	\$173,149	Average per establishment.....		39	\$567,018	\$79,446
Lumber and timber products, 1909.					Lumber and timber products, 1909.				
Less than \$5,000.....	1,020	34,093	\$57,969,170	\$32,381,700	Less than \$5,000.....	409	718	901,849	630,325
\$5,000 and less than \$20,000.....	201	1,979	2,972,757	1,807,104	\$5,000 and less than \$20,000.....	190	5,971	8,562,021	4,881,382
\$20,000 and less than \$100,000.....	190	20,632	34,056,747	19,340,702	\$100,000 and less than \$1,000,000.....	122	4,793	10,876,796	5,716,097
\$100,000 and less than \$1,000,000.....	122	20,632	34,056,747	19,340,702	\$1,000,000 and over.....	8			
\$1,000,000 and over.....	8	4,793	10,876,796	5,716,097					

¹ Includes the group "\$1,000,000 and over."² Includes the group "\$20,000 and less than \$100,000."³ Less than one-tenth of 1 per cent.

This table shows that of the 9,721 establishments in 1909 only 86, or nine-tenths of 1 per cent, had a value of products exceeding \$1,000,000. These establishments, however, employed an average of 52,740 wage earners, or 28.9 per cent of the total number in all establishments, and reported 38.6 per cent of the total value of products and 37.2 per cent of the total value added by manufacture.

On the other hand, the very small establishments—that is, those having a value of products of less than \$5,000—while constituting 31.6 per cent of the total number of establishments, reported only 1.3 per cent of the total value of products. Nearly four-fifths of the manufacturing of the state, measured by value of products, was reported by establishments having a product valued at not less than \$100,000.

It will be seen from the above table that during the five years from 1904 to 1909 there was a considerable increase in the relative importance, as measured by value of products, of the largest establishments—those reporting products of not less than \$1,000,000 in value—and a decrease in that of the remaining classes.

The fact that between 1904 and 1909 the average value of products per establishment increased from \$48,042 to \$60,725, and the average value added by manufacture from \$21,487 to \$25,095, can not be

taken as in itself indicating a tendency toward concentration. The increased values shown may be, and probably are, due in part to the increase that has taken place in the prices of commodities. The average number of wage earners per establishment increased from 18 to 19.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows, for 1909, such a classification for all industries combined and for 32 important industries individually, and gives not only the number of establishments falling into each group, but also the average number of wage earners employed.

Of the 9,721 establishments reported for all industries, 13.8 per cent employed no wage earners; 59.8 per cent employed from 1 to 5; 13.7 per cent, from 6 to 20; and 5.5 per cent, from 21 to 50. The most numerous single group consists of the 5,818 establishments employing from 1 to 5 wage earners each, and the next of the 1,343 establishments employing no wage earners. There were 149 establishments that employed over 250 wage earners; of these, 49 employed over 500 each and 12 over 1,000 each.

MANUFACTURES—WISCONSIN.

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Of the total number of wage earners, 64.5 per cent were in establishments employing over 100 wage earners. The single group having the largest number of wage earners was that comprising the establish-

ments employing from 101 to 250 wage earners. These establishments reported the employment of 36,767 wage earners, or 20.1 per cent of the total number.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	9,721	1,343	5,818	1,327	538	314	232	100	37	12
Agricultural implements.....	45	5	17	10	4	2	4	2	1	.....
Automobiles, including bodies and parts.....	30	.....	12	9	2	1	2	.....	3	1
Boots and shoes, including cut stock and findings.....	68	.....	13	11	14	13	13	3	1	.....
Bread and other bakery products.....	667	139	480	41	3	2	2	.....	.....	.....
Brick and tile.....	108	1	59	39	6	2	1	.....	.....	.....
Butter, cheese, and condensed milk.....	2,630	447	2,144	34	3	2	.....	.....	.....	.....
Canning and preserving.....	83	4	16	36	18	7	2	.....	.....	.....
Carriages and wagons and materials.....	286	65	163	38	11	1	5	2	1	.....
Cars and general shop construction and repairs by steam-railroad companies.....	22	.....	3	1	1	5	6	3	2	1
Clothing, men's, including shirts.....	94	2	15	43	15	11	4	3	1	.....
Confectionery.....	38	4	11	5	10	4	1	3	.....	.....
Cooperage and wooden goods, not elsewhere specified.....	48	6	19	11	8	1	2	1	.....	.....
Copper, tin, and sheet-iron products.....	165	2	66	26	4	2	5	.....	2	.....
Electrical machinery, apparatus, and supplies.....	30	.....	13	7	5	2	1	2	.....	.....
Flour-mill and gristmill products.....	322	54	237	23	3	5	.....	.....	.....	.....
Foundry and machine-shop products.....	444	30	165	112	67	41	13	12	6	3
Furniture and refrigerators.....	114	2	15	22	23	20	16	8	2	1
Gas, illuminating and heating.....	49	.....	27	13	5	3	.....	.....	1	.....
Gloves and mittens, leather.....	23	.....	5	5	3	4	4	2	.....	.....
Hosiery and knit goods.....	61	5	15	13	8	7	9	3	1	.....
Iron and steel, steel works and rolling mills.....	14	.....	1	3	4	3	1	.....	1	.....
Leather goods.....	48	3	16	13	4	3	7	2	.....	.....
Leather, tanned, curried, and finished.....	32	.....	5	4	5	5	4	4	3	2
Liquors, malt.....	136	2	56	53	14	4	3	1	2	1
Lumber and timber products.....	1,020	20	537	210	104	59	57	27	4	2
Marble and stone work.....	136	10	76	29	10	2	8	1	.....	.....
Paper and wood pulp.....	37	.....	.....	3	9	18	20	7	.....	.....
Printing and publishing.....	833	144	500	136	33	14	6	.....	.....	.....
Slaughtering and meat packing.....	48	2	30	4	6	3	1	.....	2	.....
Stoves and furnaces, including gas and oil stoves.....	12	.....	1	.....	2	5	2	1	1	.....
Tobacco manufactures.....	775	248	415	99	11	.....	2	.....	.....	.....
Woolen, worsted, and felt goods, and wool hats.....	33	2	13	4	3	10	1	.....	.....	.....
All other industries.....	1,310	146	673	270	125	63	27	13	3	.....
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	182,583	.....	10,201	14,806	17,422	22,337	36,767	33,765	24,553	22,732
Agricultural implements.....	2,704	.....	42	135	127	179	684	597	940	.....
Automobiles, including bodies and parts.....	4,298	.....	30	114	92	84	400	.....	2,549	1,029
Boots and shoes, including cut stock and findings.....	5,431	.....	25	136	435	917	2,007	990	921	.....
Bread and other bakery products.....	1,751	.....	336	397	99	106	313	.....	.....	.....
Brick and tile.....	1,027	.....	146	442	173	143	123	.....	.....	.....
Butter, cheese, and condensed milk.....	2,863	.....	2,359	285	104	115	.....	.....	.....	.....
Canning and preserving.....	1,770	.....	41	434	583	441	227	.....	.....	.....
Carriages and wagons and materials.....	3,437	.....	341	411	355	68	823	856	578	.....
Cars and general shop construction and repairs by steam-railroad companies.....	8,994	.....	11	9	23	418	890	978	1,199	5,466
Clothing, men's, including shirts.....	4,252	.....	40	559	493	757	648	872	883	.....
Confectionery.....	1,780	.....	18	46	327	285	142	962	.....	.....
Cooperage and wooden goods, not elsewhere specified.....	1,208	.....	36	105	240	74	254	499	.....	.....
Copper, tin, and sheet-iron products.....	2,780	.....	181	288	121	109	563	.....	1,518	.....
Electrical machinery, apparatus, and supplies.....	1,409	.....	41	79	189	124	222	754	.....	.....
Flour-mill and gristmill products.....	1,184	.....	442	253	117	372	.....	.....	.....	.....
Foundry and machine-shop products.....	24,219	.....	395	1,338	1,834	2,900	3,081	4,085	3,778	6,808
Furniture and refrigerators.....	11,118	.....	37	320	953	1,459	2,280	2,892	1,318	1,859
Gas, illuminating and heating.....	1,063	.....	48	159	141	191	.....	.....	524	.....
Gloves and mittens, leather.....	1,642	.....	17	56	97	263	562	647	.....	.....
Hosiery and knit goods.....	4,282	.....	34	161	307	513	1,379	1,072	816	.....
Iron and steel, steel works and rolling mills.....	2,124	.....	5	38	111	236	140	.....	668	1,026
Leather goods.....	2,099	.....	51	153	134	195	1,025	536	.....	.....
Leather, tanned, curried, and finished.....	7,548	.....	16	50	157	393	724	1,496	1,907	2,805
Liquors, malt.....	5,061	.....	188	621	493	284	458	334	1,199	1,484
Lumber and timber products.....	34,093	.....	1,184	2,353	3,278	4,209	9,446	9,107	2,261	2,255
Marble and stone work.....	2,593	.....	148	327	353	129	1,263	373	.....	.....
Paper and wood pulp.....	7,467	.....	.....	39	316	1,293	3,380	2,434	.....	.....
Printing and publishing.....	5,360	.....	1,139	1,379	1,116	1,038	658	.....	.....	.....
Slaughtering and meat packing.....	1,890	.....	67	37	197	187	110	.....	1,292	.....
Stoves and furnaces, including gas and oil stoves.....	1,803	.....	2	.....	68	318	350	348	717	.....
Tobacco manufactures.....	2,391	.....	859	980	328	.....	274	.....	.....	.....
Woolen, worsted, and felt goods, and wool hats.....	1,046	.....	24	42	110	720	150	.....	.....	.....
All other industries.....	21,890	.....	1,398	3,055	3,951	3,812	4,156	3,933	1,585	.....

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
All industries	100.0	5.6	8.1	9.5	12.2	20.1	18.5	13.4	12.5	
Agricultural implements.....	100.0	1.6	5.0	4.7	6.6	25.3	22.1	34.8		
Automobiles, including bodies and parts.....	100.0	0.7	2.7	2.1	2.0	9.3		60.3	23.9	
Boots and shoes, including cut stock and findings.....	100.0	0.5	2.5	3.0	16.9	37.0	18.2	17.0		
Bread and other bakery products.....	100.0	47.7	22.7	5.7	6.1	17.9				
Brick and tile.....	100.0	14.2	43.0	16.3	13.9	12.0				
Butter, cheese, and condensed milk.....	100.0	82.4	10.0	3.6	4.0					
Canning and preserving.....	100.0	2.3	27.3	32.8	24.8	12.8				
Carriages and wagons and materials.....	100.0	9.9	12.0	10.3	2.0	24.1	24.9	16.8		
Cars and general shop construction and repairs by steam-railroad companies.....	100.0	0.1	0.1	0.3	4.0	9.9	10.9	13.3	60.8	
Clothing, men's, including shirts.....	100.0	0.9	13.1	11.6	17.8	15.2	20.5	20.8		
Confectionery.....	100.0	1.0	2.6	18.4	16.0	8.0	54.0			
Cooperage and wooden goods, not elsewhere specified.....	100.0	3.0	8.7	19.9	6.1	21.0	41.3			
Copper, tin, and sheet-iron products.....	100.0	6.5	10.4	4.4	3.9	20.3		54.6		
Electrical machinery, apparatus, and supplies.....	100.0	2.9	5.6	13.4	8.8	15.8	53.5			
Flour-mill and gristmill products.....	100.0	37.3	21.4	9.9	31.4					
Foundry and machine-shop products.....	100.0	1.6	5.5	7.6	12.0	12.7	16.9	15.0	28.1	
Furniture and refrigerators.....	100.0	0.3	2.9	8.6	13.1	20.5	26.0	11.9	16.7	
Gas, illuminating and heating.....	100.0	4.5	15.0	13.3	13.0			49.3		
Gloves and mittens, leather.....	100.0	1.0	3.4	5.9	16.0	34.2	39.4			
Hosiery and knit goods.....	100.0	0.8	3.8	7.2	12.0	32.2	25.0	19.1		
Iron and steel, steel works and rolling mills.....	100.0	0.2	1.8	5.2	11.1	6.6		26.7	48.3	
Leather goods.....	100.0	2.4	7.5	6.4	9.3	48.8	25.5			
Leather, tanned, curried, and finished.....	100.0	0.2	0.7	2.1	5.2	9.6	19.8	25.3	37.2	
Liquors, malt.....	100.0	3.7	12.3	9.7	5.6	9.0	6.6	23.7	29.3	
Lumber and timber products.....	100.0	3.5	6.9	9.6	12.3	27.7	26.7	6.6	6.6	
Marble and stone work.....	100.0	5.7	12.6	13.6	5.0	48.7	14.4			
Paper and wood pulp.....	100.0		0.5	4.2	17.4	45.3	32.6			
Printing and publishing.....	100.0	21.2	25.7	20.8	19.4	12.8				
Slaughtering and meat packing.....	100.0	3.5	2.0	10.4	9.9	5.8		68.4		
Stoves and furnaces, including gas and oil stoves.....	100.0	0.1		3.8	17.6	19.4	19.3	39.8		
Tobacco manufactures.....	100.0	35.9	38.9	19.7		11.5				
Woolen, worsted, and felt goods, and wool hats.....	100.0	2.3	4.0	10.5	68.3	14.3				
All other industries.....	100.0	6.4	14.0	13.0	17.4	19.0	13.0	7.2		

Expenses.—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses which make up the total. The next table shows, in percentages, for 1909, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II, page 1356.

This table shows that for all industries combined 65.9 per cent of the total expenses were incurred for materials, 22.8 per cent for services—that is, salaries and wages—and 11.4 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries. The expense for services was greatest in the brick and tile industry, in which it represented 57.8 per cent of the total expenses, and in the marble and stone work industry, in which it formed 56.6 per cent of the total. In such industries as the manufacture of butter, cheese, and condensed milk, the flour-mill and gristmill industry, and slaughtering and meat packing, where the processes of manufacture are comparatively simple, the cost of materials forms by far the most important element of expense. The proportion of miscellaneous expenses is greatest

in the brewery industry because of the inclusion under this head of internal-revenue taxes.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries	4.9	17.9	65.9	11.4
Agricultural implements.....	14.7	15.7	41.1	28.5
Automobiles, including bodies and parts.....	4.6	28.6	56.0	10.7
Boots and shoes, including cut stock and findings.....	5.1	17.9	70.0	6.9
Bread and other bakery products.....	3.2	16.5	71.8	8.6
Brick and tile.....	6.1	51.7	28.6	13.6
Butter, cheese, and condensed milk.....	0.4	3.7	94.0	1.9
Canning and preserving.....	5.2	14.9	69.1	10.9
Carriages and wagons and materials.....	4.7	23.7	63.4	8.3
Cars and general shop construction and repairs by steam-railroad companies.....	2.8	36.5	60.5	0.2
Clothing, men's, including shirts.....	7.1	16.9	62.9	13.0
Confectionery.....	10.8	12.5	65.0	11.7
Cooperage and wooden goods, not elsewhere specified.....	4.7	29.6	53.7	11.9
Copper, tin, and sheet-iron products.....	6.6	18.0	70.6	4.7
Electrical machinery, apparatus, and supplies.....	10.4	25.3	44.8	13.4
Flour-mill and gristmill products.....	1.3	2.4	91.6	4.8
Foundry and machine-shop products.....	9.3	31.5	48.6	10.7
Furniture and refrigerators.....	7.5	30.1	51.5	10.9
Gas, illuminating and heating.....	10.8	22.1	52.5	14.6
Gloves and mittens, leather.....	5.7	22.5	64.5	7.2
Hosiery and knit goods.....	7.6	23.6	58.0	10.8
Iron and steel, steel works and rolling mills.....	2.3	14.2	79.8	3.6
Leather goods.....	9.0	19.1	62.3	9.6
Leather, tanned, curried, and finished.....	1.7	9.5	83.0	5.9
Liquors, malt.....	5.6	12.2	51.6	50.7
Lumber and timber products.....	4.6	31.4	50.1	13.9
Marble and stone work.....	5.6	51.1	34.1	9.3
Paper and wood pulp.....	3.2	17.1	73.4	6.3
Printing and publishing.....	15.3	29.5	34.3	20.9
Slaughtering and meat packing.....	1.5	4.0	90.8	3.9
Stoves and furnaces, including gas and oil stoves.....	9.3	30.4	47.5	12.8
Tobacco manufactures.....	3.6	21.6	48.9	25.8
Woolen, worsted, and felt goods, and wool hats.....	6.3	19.0	68.8	5.8
All other industries.....	5.6	14.6	65.8	14.0

Engines and power.—The following table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 ¹	1909	1904	1899 ¹	1909	1904	1899
Primary power, total	11,561	6,894	6,417	554,179	440,234	364,380	100.0	100.0	100.0
Owned.....	7,660	6,894	6,417	527,431	429,810	360,542	95.2	97.6	98.9
Steam.....	4,974	4,626	4,579	377,037	303,874	262,642	65.0	69.0	72.1
Gas.....	1,578	1,037	529	19,531	11,356	4,358	3.5	2.6	1.2
Water wheels.....	1,073	1,180	1,309	129,550	112,528	93,122	23.4	25.6	25.6
Water motors.....	35	51	(²)	181	139	(²)	(²)	(²)	(²)
Other.....				1,132	1,916	420	0.2	0.4	0.1
Rented.....	3,901	(²)	(²)	26,748	10,424	3,838	4.8	2.4	1.1
Electric.....	3,901	(²)	(²)	25,459	8,558	2,426	4.6	1.9	0.7
Other.....				1,289	1,866	1,412	0.2	0.4	0.4
Electric motors	11,402	2,969	551	114,725	48,878	13,137	100.0	100.0	100.0
Run by current generated by establishment.....	7,501	2,969	551	89,266	40,320	10,711	77.8	82.5	81.5
Run by rented power.....	3,901	(²)	(²)	25,459	8,558	2,426	22.2	17.5	18.5

¹ Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.
² Not reported.
³ Less than one-tenth of 1 per cent.

All forms of primary power except "Other" rented power increased during the decade as a whole, although "Other" owned power decreased between 1904 and 1909. The greatest increase, 114,395 horsepower, or 43.6 per cent, was in that generated by steam engines; such power formed only 68 per cent of the total primary power in 1909, however, as compared with 69 in 1904 and 72.1 in 1899. Water power, developed by water wheels, stands second in importance, and shows an increase of 36,428 horsepower, or 39.1 per cent, although it represented a somewhat smaller proportion of the total in 1909 than in 1899. The more general use of gas engines is shown by their increase in number from 529 in 1899 to 1,578 in 1909, and in horsepower from 4,358 to 19,531. The figures also show that the practice of renting electric

power is becoming more common, 4.6 per cent of the total power being of this character in 1909, as against 1.9 per cent in 1904 and seven-tenths of 1 per cent in 1899. The use of electric motors for the purpose of applying power by means of current generated within the establishments is also growing rapidly, the horsepower of such motors having increased from 10,711 in 1899 to 40,320 in 1904 and to 89,266 in 1909.

Fuel.—Closely related to the question of kind of power employed is that of the fuel consumed in generating this power, or otherwise used as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909 for all industries and for certain selected industries.

INDUSTRY.	An-thra-cite coal (tons).	Bitumi-nous coal (tons).	Coke (tons).	Wood (cords).	Oil, includ-ing gaso-line (bar-rels).	Gas (1,000 feet).
All industries	92,459	3,037,767	459,412	350,405	230,361	299,400
Agricultural implements.....	841	19,896	5,482	73	9,201	898
Automobiles, including bodies and parts.....	1,039	21,600	199	11	1,344	6,929
Boots and shoes, including cut stock and findings.....	934	10,127	10	77	440	3,533
Bread and other bakery products.....	1,890	2,429	4,407	15,370	137	37,693
Brick and tile.....	324	100,653	2,184	31,278	324	288
Butter, cheese, and condensed milk.....	1,085	71,557	149	67,455	1,014	.....
Canning and preserving.....	355	13,444	.....	537	586	330
Carriages and wagons and materials.....	2,284	24,012	2,379	793	1,554	1,371
Cars and general shop construction and repairs by steam-railroad companies.....	3,556	113,175	369	542	3,365	.....
Clothing, men's, including shirts.....	654	3,164	10	96	58	8,791
Confectionery.....	1,661	5,740	1,763	87	.....	5,492
Cooperage and wooden goods, not elsewhere specified.....	46	2,315	157	525	31	236
Copper, tin, and sheet-iron products.....	115	14,435	1,692	28	8,687	20,087
Electrical machinery, apparatus, and supplies.....	345	14,467	729	14	6,282	3,974
Flour-mill and gristmill products.....	3,057	46,354	7	14,389	1,947	1,224
Foundry and machine-shop products.....	9,544	267,670	60,431	4,942	50,865	68,312
Furniture and refrigerators.....	1,281	65,187	3,237	7,456	987	2,905
Gas, illuminating and heating.....	496	189,477	20,963	64	30,856	17,190
Gloves and mittens, leather.....	241	1,342	15	6	1	8,329
Hosiery and knit goods.....	1,321	14,879	4	30	262	362
Iron and steel, blast furnaces.....	110	8,902	328,786	125	14,000	129
Iron and steel, steel works and rolling mills.....	158	117,043	3,171	112	48,942	.....
Leather goods.....	148	5,461	20	534	54	3,515
Leather, tanned, curried, and finished.....	2,745	136,489	10	695	.....	845
Lime.....	.....	22,483	.....	116,053	200	.....
Liquors, malt.....	7,615	177,878	238	12,934	176	1,844
Lumber and timber products.....	883	45,568	70	8,636	1,372	1,720
Marble and stone work.....	157	18,747	31	127	347	2,230
Paper and wood pulp.....	.....	432,234	.....	37,678	4,756	.....
Printing and publishing.....	1,607	7,838	431	3,035	1,042	18,071
Slaughtering and meat packing.....	751	45,681	.....	674	60	636
Stoves and furnaces, including gas and oil stoves.....	607	7,061	5,178	201	906	425
Tobacco manufactures.....	1,000	1,439	300	909	12	252
Woolen, worsted, and felt goods, and wool hats.....	16	13,838	.....	452	56	.....
All other industries.....	45,591	988,470	10,990	24,461	27,837	81,789

NOTE.—In addition, there were 47,901 tons of other varieties of fuel reported.

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom sawmills and gristmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products and other information for securing which no provision is made on the general schedule. Data of this character for 10 important industries in Wisconsin are here presented.

Lumber and timber products.—The following is a statement of the production of rough lumber, lath, and shingles in 1909 and 1899:

PRODUCT.	QUANTITY.	
	1909	1899
Rough lumber.....M feet b. m..	2,025,038	3,389,166
Lath.....thousands..	299,845	418,011
Shingles.....thousands..	392,863	994,427

In 1899 Wisconsin ranked first as a lumber-producing state, but by 1909 its forests had become so far depleted as to cause the state to drop to eighth place. The decrease in the cut of rough lumber during the decade amounted to 1,364,128 M feet board measure, or 40.2 per cent, while the production of lath decreased 118,166,000, or 28.3 per cent, and that of shingles 601,564,000, or 60.5 per cent.

Of the total cut for 1909, 1,399,398 M feet board measure were sawed from softwoods of which 709,347 M feet were hemlock and 612,327 M feet white pine. The chief varieties of hardwoods, ranking in importance in the order named, were birch, basswood, maple, oak, and elm. Considerable quantities of spruce, cedar, tamarack, beech, and ash were also cut.

Butter, cheese, and condensed milk.—The next table shows the quantity and value of the various products of the butter, cheese, and condensed-milk factories in 1909, 1904, and 1899.

Wisconsin ranks first among the states in the value of the products of the butter, cheese, and condensed-milk industry, having displaced New York from first place since 1904. The industry is third among the manufacturing industries of the state in value of products.

Of the three branches into which this industry is divided, the butter factories reported 56.2 per cent of the total value of products in 1909, 62.2 per cent in 1904, and 62.3 per cent in 1899; the cheese factories, 39.4 per cent in 1909, 35.1 per cent in 1904, and 36.5 per cent in 1899; and the condensed-milk factories, 4.1 per cent in 1909, 2.7 per cent in 1904, and 1.1 per cent in 1899. In 1909 Wisconsin ranked first among the states in the value of butter and of cheese produced, and fifth in that of condensed milk.

The quantity of butter produced increased 16.5 per cent from 1904 to 1909 and 44.2 per cent from 1899 to

1904. Of the total value of the butter produced in 1909 that of butter packed solid represented 73.9 per cent and that of the product put up in prints and rolls 26.1 per cent.

The output of cheese increased 35.3 per cent from 1904 to 1909, and 40.7 per cent from 1899 to 1904. Of the total output in 1909, 99.3 per cent was full-cream cheese.

PRODUCT.	1909	1904	1899
Total value.....	\$53,843,249	\$29,994,791	\$20,120,147
Butter:			
Packed solid—			
Pounds.....	77,137,253	69,166,599	55,826,290
Value.....	\$21,833,972	\$14,145,383	\$10,714,115
Prints or rolls—			
Pounds.....	26,747,431	19,989,376	5,987,212
Value.....	\$7,713,163	\$4,287,819	\$1,207,799
Cream sold:			
Pounds.....	4,490,508	731,721	2,010,568
Value.....	\$545,723	\$61,623	\$123,578
All other butter-factory products ¹	\$190,633	\$162,380	\$490,036
Cheese:			
Full-cream—			
Pounds.....	147,071,501		
Value.....	\$21,070,010		
Part-cream—			
Pounds.....	229,892	109,423,856	77,448,680
Value.....	\$19,405	\$10,488,833	\$7,281,181
Other kinds ² —			
Pounds.....	764,255		
Value.....	\$52,225		
All other cheese-factory products ³	\$30,982	\$45,494	\$72,213
Condensed milk:			
Sweetened—			
Pounds.....	10,661,772	10,389,856	3,466,516
Value.....	\$1,240,398	\$735,504	\$231,225
Unsweetened—			
Pounds.....	13,912,114	1,124,366	
Value.....	\$977,841	\$62,735	
All other condensed-milk factory products.....	\$15,899		
All other products.....	\$102,998	\$5,000	

¹ Includes skimmed milk sold and casein.² Includes skimmed-milk cheese.³ Includes whey.

The production of condensed milk increased 165.5 per cent from 1904 to 1909, and 232.2 per cent from 1899 to 1904. In 1899 there was no unsweetened condensed milk reported. In 1904, 9.8 per cent, and in 1909, 45.5 per cent, of the condensed milk was unsweetened.

Flour-mill and gristmill products.—The next table shows the quantity and value of the principal products of the merchant mills in 1909, 1904, and 1899.

Wheat flour was the principal product of the industry throughout the period covered by the table, contributing 56.6 per cent of the total value of products for the industry in 1909, 62.1 per cent in 1904, and 63.6 per cent in 1899. While the total value of products increased 11.7 per cent during the five years 1904 to 1909, owing chiefly to the general increase in the prices of such commodities, there were actual decreases in the output of white flour, corn meal and corn flour, buck-wheat flour, and offal.

In 1909 the mills of the state were equipped with 3,158 pairs of rolls and 248 runs of stone, as compared with 4,072 pairs of rolls and 361 runs of stone in 1904. In 1909 four mills manufactured barrels.

PRODUCT.	1909	1904	1899
Total value.....	\$31,667,434	\$28,352,237	\$23,700,874
Wheat flour:			
White—			
Barrels.....	3,467,316	3,726,363	
Value.....	\$17,764,495	\$17,531,813	
Graham—			
Barrels.....	32,649	18,010	4,638,698
Value.....	\$144,594	\$79,198	\$15,082,162
Corn meal and corn flour:			
Barrels.....	85,532	95,801	232,972
Value.....	\$287,740	\$246,651	\$403,005
Rye flour:			
Barrels.....	549,359	547,097	611,295
Value.....	\$2,194,220	\$1,990,327	\$1,672,630
Buckwheat flour:			
Pounds.....	9,330,781	15,980,819	13,205,256
Value.....	\$300,929	\$416,517	\$309,024
Barley meal:			
Pounds.....	5,817,400	3,439,960	5,901,000
Value.....	\$91,494	\$38,110	\$73,373
Feed:			
Tons.....	269,793	243,810	333,391
Value.....	\$7,033,082	\$4,916,055	\$4,849,278
Offal:			
Tons.....	132,991	185,342	94,365
Value.....	\$3,053,366	\$3,033,568	\$1,037,622
All other products.....	\$797,514	\$100,000	\$273,780

Slaughtering and meat packing.—The following table shows the quantity and value of the principal products reported at the censuses of 1909, 1904, and 1899:

PRODUCT.	1909	1904 ¹	1899 ¹
Total value.....	\$27,216,864	\$16,568,919	\$14,141,931
Beef, fresh:			
Pounds.....	35,859,863	28,643,346	24,282,329
Value.....	\$2,605,870	\$1,712,783	\$1,622,676
Veal, fresh:			
Pounds.....	9,615,384	2,594,829	1,806,512
Value.....	\$1,110,373	\$201,725	\$157,079
Mutton, fresh:			
Pounds.....	2,060,498	2,389,517	1,564,703
Value.....	\$194,705	\$172,180	\$129,923
Pork, fresh:			
Pounds.....	48,264,738	35,997,546	24,797,944
Value.....	\$4,802,343	\$2,447,493	\$1,463,007
Pork, salted or cured:			
Pounds.....	106,390,708	100,474,432	108,781,273
Value.....	\$11,699,374	\$8,345,852	\$7,241,055
Sausage, fresh or cured.....	\$2,476,466	\$1,448,005	\$1,095,130
All other fresh meat:			
Pounds.....	1,440,143	350,000	200,983
Value.....	\$108,902	\$26,500	\$18,467
Lard:			
Pounds.....	19,173,185	16,859,549	21,950,975
Value.....	\$2,120,334	\$1,193,044	\$1,225,846
Tallow, oleo stock, and stearin:			
Pounds.....	1,530,506	(²)	(²)
Value.....	\$125,075	(²)	(²)
Fertilizers and fertilizer materials:			
Tons.....	5,703	3,192	3,237
Value.....	\$161,984	\$73,795	\$48,324
Hides:			
Number.....	90,268	60,459	68,472
Pounds.....	4,613,282	3,556,922	2,892,705
Value.....	\$590,057	\$323,231	\$299,905
Pelts:			
Number.....	47,917	55,846	(²)
Value.....	\$53,386	\$57,553	(²)
All other products.....	\$1,182,995	\$566,768	\$840,519

¹ Excluding statistics for two establishments, to avoid disclosure of individual operations.
² Figures not available.

Variation in the quantity of production best indicates the activity of this industry. During the decade the production of fresh beef in Wisconsin increased 47.7 per cent, that of fresh pork 94.6 per cent, that of fresh veal 432.3 per cent, that of fresh mutton 31.7 per cent, and number of hides 31.8 per cent, while that of salted or cured pork decreased 2.2 per cent, and that of lard 12.7 per cent. There were 73,049 beeves, 129,207 calves, 48,518 sheep, and 1,078,361 hogs slaughtered

by the establishments in this industry in the state in 1909, as compared with 59,659 beeves, 34,507 calves, 58,374 sheep, and 938,418 hogs slaughtered in 1904.

Leather, tanned, curried, and finished.—The following table shows the quantity and value of the principal materials and products reported for this industry at the censuses of 1909, 1904, and 1899:

MATERIAL OR PRODUCT.	1909	1904	1899
Materials used, total cost.....	\$34,828,585	\$19,870,887	\$16,040,304
Hides, all kinds:			
Number.....	2,471,848	2,457,195	2,108,986
Cost.....	\$16,373,708	\$11,027,774	\$9,394,950
Skins:			
Calf and kip—			
Number.....	6,986,673	3,633,271	2,819,011
Cost.....	\$12,379,808	\$4,816,826	\$3,545,663
All other—			
Number.....	1,186,702	149,808	247,619
Cost.....	\$1,321,192	\$119,029	\$400,596
Fuel and rent of power.....	\$386,034	\$253,840	\$112,393
All other materials.....	\$4,367,845	\$3,653,418	\$2,580,702
Products, total value.....	\$44,667,676	\$25,845,123	\$20,074,373
Leather:			
Sole.....	\$4,414,972	\$4,231,785	\$4,500,714
Hemlock—			
Sides.....	558,474	1,038,181	1,628,888
Value.....	\$2,885,899	\$3,974,016	\$4,491,748
Union and chrome—			
Sides.....	280,897	53,350	2,100
Value.....	\$1,529,073	\$257,769	\$8,966
Upper, other than calf or kip skins... Grain, satin, pebble, patent, and enameled leather—	\$10,777,605	\$5,681,841	\$3,826,188
Sides.....	3,001,814	1,927,329	1,308,648
Value.....	\$9,765,814	\$4,763,787	\$3,303,777
Finished splits—			
Number.....	2,097,549	1,406,380	979,688
Value.....	\$1,011,791	\$918,054	\$522,361
Calf and kip skins—			
Number.....	7,016,966	3,564,723	2,797,925
Value.....	\$17,306,021	\$6,940,331	\$4,862,420
Harness—			
Sides.....	1,331,925	1,504,944	961,966
Value.....	\$7,987,575	\$6,097,651	\$4,194,372
Glove.....	\$1,368,618	\$870,321	\$342,672
All other.....	\$1,848,224	\$1,470,550	\$1,793,761
All other products.....	\$727,112	\$537,010	\$533,170
Amount received for work on materials for others.....	\$247,549	\$15,625	\$21,126

¹ Includes colt, goat, and sheep skins.

The increase in the cost of all materials from 1899 to 1904 was 23.9 per cent, and from 1904 to 1909, 75.3 per cent. The number of hides used increased 17.3 per cent during the decade, while the number of skins used increased 166.4 per cent.

Every product enumerated in the table, except hemlock sole leather, shows a large increase in value during the 10 years. The decrease in the output of hemlock sole leather was accompanied by a marked increase in that of union and chrome sole leather, an increase not great enough, however, to compensate for the decrease in the hemlock product. The percentage of decrease in the total output of sole leather amounted to 23.1 from 1904 to 1909, and 33.1 from 1899 to 1904. The output of grain, satin, pebble, patent, and enameled leather more than doubled between 1899 and 1909, and its value nearly trebled, while both the number and the value of finished splits of upper leather about doubled during the same time. Calf and kip skins, which contributed nearly 40 per cent of the total value of products in 1909, show the greatest absolute gain in value of any of the products during the last five years, and

also, with the exception of union and chrome sole leather, the greatest relative gain. There was a decrease of 11.5 per cent between 1904 and 1909 in the number of sides of harness leather produced, but an increase of 31 per cent in their value.

Boots and shoes.—The number of pairs of the different kinds of boots and shoes made in 1909, 1904, and 1899 are shown in the following table:

KIND.	NUMBER OF PAIRS.		
	1909	1904	1899
Boots and shoes.....	6,777,363	3,951,542	3,230,682
Men's.....	4,055,496	2,064,125	1,428,720
Boys' and youths'.....	652,109	548,867	330,007
Women's.....	1,442,341	737,557	1,226,134
Misses' and children's.....	627,417	600,983	245,821
Slippers.....	204,872	269,942	202,597
Men's, boys', and youths'.....	39,018	41,288	17,732
Women's, misses', and children's.....	165,854	228,654	184,865
Infants' shoes and slippers.....	145,319	(¹)	(¹)
All other.....	169,075	186,984	68,948

¹ Not reported separately.

The increase in the total output of boots and shoes from 1904 to 1909 was 2,825,821 pairs, or 71.5 per cent, and from 1899 to 1904, 720,860 pairs, or 22.3 per cent. An increased production is shown for each class of boots and shoes for the decade as a whole, that in men's being the greatest. Women's boots and shoes show a decrease of 488,567 pairs from 1899 to 1904, which, however, was more than offset by the increase from 1904 to 1909. Of the total output of boots and shoes in 1909, 59.8 per cent were men's, 9.6 per cent boys' and youths', 21.3 per cent women's, and 9.3 per cent misses' and children's.

The following table shows the number of pairs of the different kinds of boots and shoes made in 1909, classified according to method of manufacture:

KIND.	NUMBER OF PAIRS, BY METHOD OF MANUFACTURE.				
	Total.	Machine or hand welt.	McKay.	Wire-screw, or metal fastened.	All other methods.
Boots and shoes.....	6,777,363	1,752,838	1,963,483	2,488,531	572,511
Men's.....	4,055,496	1,353,302	433,809	2,175,069	93,756
Boys' and youths'.....	652,109	79,093	249,697	297,759	25,560
Women's.....	1,442,341	320,383	750,238	15,708	355,917
Misses' and children's.....	627,417	(¹)	530,139	(¹)	97,278
Slippers.....	204,872	45,721	107,834	(¹)	51,317
Men's, boys', youths'.....	39,018	4,658	22,184	(¹)	12,176
Women's, misses', children's.....	165,854	41,063	35,650	(¹)	39,141
Infants' shoes and slippers.....	145,319	4,000	(¹)	(¹)	141,319
All other.....	169,075	5,674	(¹)	109,201	54,200

¹ Included under "All other methods," to avoid disclosing the operations of individual establishments.

The wire screw or metal fastening was the method most employed in the manufacture of men's and of boys' and youths' boots and shoes, and the McKay process the most common in the manufacture of the remaining classes shown separately in the table. Of the total output of boots and shoes, those made by the machine or hand welt process formed 25.9 per cent, those made by the McKay process 29 per cent, those made with wire screws or metal fastenings 36.7 per cent, and those made by all other methods 8.4 per cent.

Paper and wood pulp.—The following table shows for this industry the quantity and cost of the materials used, the quantity and value of the products reported, and the number and capacity of the principal machines used for the census years 1909, 1904, and 1899:

MATERIAL, PRODUCT, AND EQUIPMENT.	1909	1904	1899
Materials used, total cost.....	\$16,682,565	\$10,692,290	\$6,712,749
Pulp wood.....	\$4,325,839	\$2,502,892	\$1,136,051
Wood pulp, purchased:			
Tons.....	157,416	107,479	73,231
Cost.....	\$5,511,750	\$3,385,155	\$2,240,561
Ground—			
Tons.....	64,959	43,514	36,089
Cost.....	\$1,457,025	\$376,180	\$708,130
Soda fiber—			
Tons.....	7,573	5,154	4,390
Cost.....	\$338,621	\$218,608	\$204,021
Sulphite fiber—			
Tons.....	84,834	58,511	32,252
Cost.....	\$3,716,104	\$2,290,367	\$1,328,710
Rags, including cotton and flax waste and sweepings:			
Tons.....	19,741	24,615	29,049
Cost.....	\$595,554	\$692,331	\$717,400
Old and waste paper:			
Tons.....	29,607	8,412	7,725
Cost.....	\$591,019	\$169,026	\$165,777
All other paper stock.....	\$136,496	\$314,253	\$139,162
All other materials, including fuel.....	\$5,531,907	\$3,628,033	\$2,313,489
Products, total value.....	\$25,982,099	\$17,844,174	\$10,895,576
News paper:			
Tons.....	169,151	121,749	90,075
Value.....	\$7,201,706	\$5,137,635	\$3,253,391
Book, cover, plate, and coated paper:			
Tons.....	58,705	52,283	25,599
Value.....	\$3,881,708	\$2,839,787	\$1,644,663
Writing paper:			
Tons.....	27,379	17,393	113,001
Value.....	\$3,271,402	\$2,060,243	\$1,459,199
Wrapping paper:			
Tons.....	98,083	94,454	46,889
Value.....	\$5,083,757	\$4,200,088	\$2,048,805
Tissues:			
Tons.....	10,835	5,959	2,960
Value.....	\$938,516	\$571,378	\$250,331
Other paper products:			
Tons.....	24,506	4,796	7,217
Value.....	\$914,835	\$205,656	\$351,072
Wood pulp made for sale or for consumption in mills other than where produced:			
Tons.....	111,683	89,277	63,657
Value.....	\$3,711,517	\$2,754,203	\$1,855,953
All other products.....	\$908,658	\$19,214	\$2,162
Wood pulp produced (including that used in mills where manufactured), total tons.....	321,213	241,537	137,098
Ground.....	166,822	124,746	77,305
Soda fiber.....		3,744	
Sulphite fiber.....	154,391	113,047	59,793
Equipment:			
Paper machines:			
Total number.....	90	93	75
Capacity, yearly, tons.....	481,703	345,879	222,046
Fourdriner—			
Number.....	91	88	68
Capacity per 24 hours, tons.....	1,315	1,112	(²)
Cylinder—			
Number.....	8	5	7
Capacity per 24 hours, tons.....	108	36	(²)
Pulp:			
Grinders—			
Number.....	233	197	174
Capacity, yearly, tons.....	270,561	193,720	(²)
Digesters—			
Number.....	53	50	43
Capacity, yearly, tons.....	167,121	141,325	(²)

¹ Includes 3,659 tons of "Other fine paper," valued at \$464,678.

² Not reported.

³ Not reported separately.

The total cost of all materials increased 56.1 per cent from 1904 to 1909, and 59.3 per cent from 1899 to 1904. Of the wood pulp purchased in 1909, 41.3 per cent was ground, 4.8 per cent soda fiber, and 53.9 per cent sulphite fiber. There was a slight decrease in the quantity of rags purchased and an increase in the consumption of old and waste paper.

The total value of the products of the industry increased 45.5 per cent from 1904 to 1909 and 63.8 per cent from 1899 to 1904. All classes of products increased in both quantity and value during the decade. In 1909 news paper represented 33.7 per cent of the total value of paper products; book paper, 18.2 per cent; writing paper, 15.3 per cent; wrapping paper, 23.8 per cent; tissues, 4.6 per cent; and other paper products, 4.3 per cent. Of the 321,213 tons of wood pulp produced in 1909, 51.9 per cent was ground and 48.1 per cent sulphite fiber. There is an element of duplication in the industry in the item of wood pulp produced for sale, since much of it is sold to paper mills within the state, by which it is used and reported in the value of products. The equipment of the mills has been increased during the decade.

Printing and publishing.—The following table shows the number and aggregate circulation of the various classes of newspapers and periodicals published in Wisconsin in 1909, 1904, and 1899:

PERIOD OF ISSUE.	NUMBER OF PUBLICATIONS.			AGGREGATE CIRCULATION PER ISSUE.		
	1909	1904	1899	1909	1904	1899
Total.....	677	711	608	2,121,682	2,077,826	1,426,499
Daily.....	65	65	60	401,886	307,118	213,882
Sunday.....	8	9	18	130,778	126,238	(1)
Semiweekly.....	23	37	22	42,703	194,230	162,995
Weekly.....	512	598	463	1,012,502	902,467	771,574
Monthly.....	56	52	42	468,088	500,046	189,948
All other classes.....	13	10	8	65,700	47,727	85,100

¹ Included in circulation of dailies.

The newspaper and periodical branch of the industry in Wisconsin shows a decided growth for the last decade, as measured by aggregate circulation. The total number of publications was also considerably larger in 1909 than in 1899, in spite of a decrease from 1904 to 1909. The weeklies show the greatest increase in number, and the monthlies the greatest increase in circulation. There were decreases during the decade as a whole in the number of Sunday publications and in the circulation of the semiweeklies and of the publications included under the head of "All other classes," although the circulation of the latter increased somewhat between 1904 and 1909.

In 1909, 10 of the 65 daily papers, with an aggregate circulation of 105,042, were issued as morning editions. Of the 677 publications reported, 107 were printed in foreign languages. These included 6 dailies, of which 4 were printed in German and 2 in Polish; 1 Sunday edition, printed in German; 14 semi-weeklies, 13 of which were printed in German and 1 in Dutch; 73 weeklies, of which 56 were in German, 6 in Bohemian, 4 in Norwegian, 3 in Polish, 2 in Swedish, 1 in Italian and English, and 1 in Norwegian and Danish; 8 monthlies, 4 of which were in German, 1 in Bohemian, 1 in Norwegian, 1 in German and English, and 1 in Norwegian and Danish; and 5 belonging to other classes, 2 of which were in German, 2 in German and English, and 1 in English, German, French, and

Spanish. These publications in foreign languages reported an aggregate circulation per issue of 667,073, representing 31.4 per cent of the total for the state.

Automobiles, including bodies and parts.—The following table shows the number and value of the different products of this industry in 1909 and 1904:

PRODUCT.	1909		1904	
	Number.	Value.	Number.	Value.
Total value.....		\$11,440,242		\$1,875,259
Automobiles (gasoline).....	5,591	7,085,562	2,390	\$1,856,604
Runabouts, touring cars, and cabs.....	5,559	7,050,862	2,378	1,846,224
Delivery wagons and trucks...	32	34,700	12	19,400
All other products, including bodies and parts and repair work.....		4,354,680		18,565

¹ Excluding the statistics for two establishments engaged in the manufacture of automobile bodies and parts, to avoid disclosure of individual operations.
² Electric machines included, to avoid disclosure of individual operations.

A rapid development is shown by the above table to have taken place in the manufacture of automobiles and of automobile bodies and parts. The number of automobiles manufactured increased from 2,390 in 1904 to 5,591 in 1909, a gain of 133.9 per cent. Of those built in 1909, 5,559 were passenger and 32 business machines.

Carriages and wagons and materials.—The following table shows the number and value of the principal products of the carriage and wagon factories of the state in 1909, 1904, and 1899:

PRODUCT.	1909	1904	1899
Total value.....	\$8,899,171	\$8,089,491	\$7,033,945
Carriages (family and pleasure):			
Number.....	24,726	23,466	36,323
Value.....	\$1,519,006	\$1,520,841	\$2,022,608
Wagons:			
Number.....	92,011	83,916	70,210
Value.....	\$4,853,561	\$4,396,693	\$3,308,455
Business—			
Number.....	11,564	12,910	(1)
Value.....	\$732,544	(1)	(1)
Farm—			
Number.....	80,376	70,814	(1)
Value.....	\$4,102,301	(1)	(1)
Government, municipal, etc.—			
Number.....	71	192	(1)
Value.....	\$18,716	(1)	(1)
Public conveyances:			
Number.....	90	103	101
Value.....	\$33,390	\$39,720	\$31,900
Sleighs and sleds:			
Number.....	17,720	15,365	17,451
Value.....	\$399,310	\$343,509	\$325,106
All other products, including parts and repair work.....	\$2,093,814	\$1,788,723	\$1,345,876

¹ Figures not available.

In 1909 the value of carriages represented 17.1 per cent of the total value of products; that of wagons, 54.5 per cent; that of public conveyances, four-tenths of 1 per cent; and that of sleighs and sleds, 4.5 per cent. Farm wagons were the most important product manufactured, contributing 46.1 per cent of the total value of products for the industry in 1909. While there was a slight increase in the number of carriages built in 1909 as compared with 1904, there was a slight decrease in their value. Both the number and value of carriages show a considerable decrease as compared with 1899, this being the result of the increasing use of the automobile.

Laundries.—Statistics for steam laundries are not included in the general tables or in the totals for manufacturing industries. There were 147 such establishments in the state in 1909, of which 33 were in Milwaukee, 3 in Appleton, 3 in Beloit, 3 in Janesville, 4 in Kenosha, 4 in La Crosse, 3 in Madison, 3 in Manitowoc, 3 in Oshkosh, and 5 in Racine.

The following statement summarizes the statistics:

Number of establishments.....	147
Persons engaged in the industry.....	2,332
Proprietors and firm members.....	159
Salaried employees.....	159
Wage earners (average number).....	2,014
Primary horsepower.....	2,373
Capital.....	\$1,379,730
Expenses.....	1,435,339
Services.....	863,595
Materials.....	331,907
Miscellaneous.....	239,837
Amount received for work done.....	1,840,327

Seventy-seven of the 147 establishments were operated by individuals, 38 by firms, and 32 by corporations. Forty-nine establishments reported receipts for the year's business of less than \$5,000 each; 75, receipts of between \$5,000 and \$20,000; and 23, receipts of between \$20,000 and \$100,000.

The number of wage earners employed each month and the percentage which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	1,921	89.8	July.....	2,136	99.9
February.....	1,917	89.7	August.....	2,138	100.0
March.....	1,936	90.6	September.....	2,105	98.5
April.....	1,937	90.6	October.....	2,030	94.9
May.....	1,937	92.9	November.....	2,009	94.0
June.....	2,035	95.2	December.....	2,018	94.4

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
Primary power, total.....		2,373
Owned:		
Steam.....	123	2,104
Gas.....	7	33
Rented:		
Electric.....	40	220
Other.....		16

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	170
Bituminous coal.....	Tons.....	25,349
Coke.....	Tons.....	214
Wood.....	Cords.....	1,772
Oil.....	Barrels.....	366
Gas.....	1,000 feet.....	9,973

Custom sawmills and gristmills.—Statistics for custom sawmills and gristmills are not included in the general tables or in the totals for manufacturing industries, but are presented in the following summary:

	Custom sawmills.	Custom gristmills.
Number of establishments.....	251	371
Persons engaged in the industry.....	732	638
Proprietors and firm members.....	367	447
Salaried employees.....	2	9
Wage earners (average number).....	363	182
Primary horsepower.....	6,930	15,076
Capital.....	\$432,029	\$1,667,710
Expenses.....	150,320	4,993,307
Services.....	116,291	79,967
Materials.....	5,456	14,864,845
Miscellaneous.....	28,573	48,494
Value of products.....	291,736	15,578,660

¹ Includes estimate of all grain ground. A similar estimate for value of lumber sawed by custom sawmills is impracticable.

MANUFACTURES—WISCONSIN.

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TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899—Continued.
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES—Continued.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employes.	Wage earners (average number).							
STATE—Continued.													
Musical instruments, pianos and organs and materials.	1909 1904 1899	11 3 3	443 92 18	26 3 3	48 5 15	369 84 14	339 37 14	\$754 41 25	\$54 4 7	\$202 45 7	\$490 120 6	\$593 184 18	\$403 64 12
Paint and varnish.....	1909 1904 1899	12 9 5	288 192 127	5 6 6	89 34 43	194 152 78	935 731 367	1,260 936 463	93 30 29	99 70 23	1,043 764 676	1,526 1,048 882	483 284 206
Paper and wood pulp.....	1909 1904 1899	57 52 47	7,878 6,027 4,442	1 2 3	410 287 199	7,467 6,338 4,240	136,903 105,940 76,876	33,738 24,409 16,580	731 435 308	3,891 2,983 1,649	16,693 10,692 6,713	25,962 17,844 10,896	9,269 7,152 4,183
Patent medicines and compounds and druggists' preparations.	1909 1904 1899	62 58 43	616 399 442	53 54 54	294 83 297	269 262 297	219 113 113	1,288 761 623	275 85 52	118 77 108	445 362 228	1,707 1,235 674	1,262 871 446
Pens, fountain, stylographic, and gold..	1909 1904 1899	5 3 2	94 57 57	2 2 2	45 28 28	47 29 29	18 10 10	254 130 130	30 17 17	22 14 14	122 77 77	248 188 188	126 111 111
Photo-engraving.....	1909 1904 1899	10 5 4	232 132 56	9 2 3	52 27 2	171 103 51	66 35 35	116 66 22	47 16 2	130 76 27	46 20 8	312 166 51	266 146 43
Printing and publishing.....	1909 1904 1899	833 787 1,036	7,860 7,036 7,036	864 800 883	1,636 1,137 583	5,360 5,099 4,413	5,293 5,064 5,064	10,763 8,020 6,474	1,505 1,009 543	2,913 2,435 1,831	3,386 2,642 1,727	11,861 9,252 6,408	8,475 6,610 4,681
Slaughtering and meat packing.....	1909 1904 1899	48 23 19	2,263 1,703 1,660	56 26 26	317 156 133	1,890 1,580 1,501	3,283 2,457 2,457	6,629 4,887 4,031	356 197 164	1,042 782 611	23,403 14,072 12,244	27,217 10,569 14,142	3,814 2,497 1,898
Stoves and furnaces, including gas and oil stoves.	1909 1904 1899	12 11 4	2,116 1,529 1,529	1 5 5	312 165 165	1,803 1,359 1,359	1,631 914 914	3,986 2,591 2,591	307 184 184	1,003 666 666	1,569 1,052 1,052	3,737 2,445 2,445	2,168 1,393 1,393
Tobacco manufactures.....	1909 1904 1899	775 767 628	3,380 3,808 3,054	831 849 687	158 209 98	2,391 2,810 2,298	286 457 475	2,995 3,153 2,316	187 201 129	1,106 1,196 903	2,507 2,186 1,697	6,142 6,346 4,888	3,635 4,160 3,191
Woolen, worsted, and felt goods, and wool hats.	1909 1904 1899	33 29 35	1,178 1,228 1,228	23 27 65	109 64 65	1,046 1,137 1,037	3,059 2,476 2,476	2,574 2,340 2,396	127 84 87	381 381 316	1,376 1,400 1,163	2,230 2,298 1,855	854 898 692
All other industries.....	1909 1904 1899	736 620 654	15,335 11,096 11,096	656 585 1,098	2,091 1,059 1,098	12,588 9,452 11,323	36,876 26,315 26,315	47,607 27,161 21,650	2,245 1,171 1,066	6,321 4,811 4,020	25,291 14,293 12,538	46,702 26,219 25,162	21,411 11,920 12,614

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

MILWAUKEE—All industries..	1909 1904 1899	1,764 1,527 1,419	68,933 49,843 49,843	1,472 1,393 1,393	7,959 6,084 4,077	59,502 43,366 41,220	94,254	\$219,391 161,494 105,604	\$9,405 5,837 4,305	\$31,437 20,809 17,102	\$120,621 71,103 69,694	\$208,324 137,695 110,854	\$87,703 66,892 51,180
Artificial stone.....	1909 1904 1899	9 4 4	95 26 26	2 5 5	13 8 8	80 23 23	238	180 73 73	10 5 5	47 13 13	60 24 24	161 72 72	101 48 48
Boots and shoes, including out stock and findings.	1909 1904 1899	26 27 22	3,253 1,788 1,788	13 20 20	272 99 103	2,973 1,669 1,798	1,481	5,812 2,054 1,455	334 98 98	1,235 632 525	4,950 2,040 1,694	7,800 3,182 2,593	2,850 1,142 899
Bread and other bakery products.....	1909 1904 1899	318 256 249	1,442 1,558 1,067	331 258 248	136 133 93	975 1,167 721	509	3,105 1,771 947	114 104 68	528 492 267	2,213 2,100 1,680	3,824 3,510 2,158	1,611 1,410 1,068
Brooms and brushes.....	1909 1904 1899	21 17 20	204 162 136	17 15 23	39 26 9	148 121 104	96	178 146 69	25 18 7	67 58 32	158 92 99	330 233 179	181 141 80
Carriages and wagons and materials....	1909 1904 1899	23 34 29	205 475 475	31 44 44	6 19 8	168 412 243	310	388 728 517	8 17 8	103 219 111	376 490 149	566 881 367	190 391 218
Clothing, men's, including shirts.....	1909 1904 1899	66 84 80	3,096 2,203 1,960	61 91 87	353 189 174	2,682 1,923 1,699	344	4,565 2,767 2,353	423 254 196	975 621 465	3,467 2,394 1,894	6,278 4,790 3,637	2,511 2,396 1,743
Clothing, women's.....	1909 1904 1899	14 9 6	440 249 191	11 11 11	38 22 19	391 216 161	45	247 148 101	57 25 14	139 80 49	252 149 54	669 334 189	317 185 135
Confectionery.....	1909 1904 1899	14 12 10	1,560 761 761	8 5 5	338 74 65	1,214 682 495	910	1,941 739 451	305 86 61	356 184 111	1,836 871 648	3,063 1,380 989	1,227 509 341

¹ Excluding statistics for one establishment, to avoid disclosure of individual operations.
² Figures can not be shown without disclosing individual operations.
³ Excluding statistics for two establishments, to avoid disclosure of individual operations.
⁴ Not reported separately.
⁵ Figures do not agree with those published in 1904, because it was necessary to revise the totals in order to include data only for those establishments located within the corporate limits of the city.

TABLE II.—DETAIL STATEMENT FOR THE

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.				Primary horse-power.	
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.		Clerks.		Wage earners.				Total.	16 and over.		Under 16.		
				Male.	Female.	Average number.	Number.		Male.	Female.	Male.		Female.				
							Maximum month.	Minimum month.									
1 Marble and stone work.....	130	2,893	148	61	60	16	2,593	Se 3,141	Ja 1,700	2,432	2,431	1	1	4,847			
2 Mattresses and spring beds.....	21	603	12	26	47	14	504	No 562	Ja 431	551	440	92	10	917			
3 Millinery and lace goods.....	7	323	3	7	5	1	307	Mh 522	Jy 123	322	114	107	1	163			
4 Mirrors.....	5	97	1	7	1	1	87	Oc 93	Jy 82	92	92	1	10	190			
5 Models and patterns, not including paper patterns.	20	150	19	9	7	3	112	No 125	Ja 100	124	103	14	7	190			
6 Musical instruments and materials, not specified.	4	7	5				2	Ja ¹ 2	De ¹ 2	2	2			1			
7 Musical instruments, pianos and organs and materials.	11	443	26	21	15	12	309	Se 407	Mh 298	387	371	8	8	339			
8 Optical goods.....	3	40	2	1	6	10	21	Ja ¹ 21	De ¹ 21	21	18	1	1	9			
9 Paint and varnish.....	12	288	5	19	63	7	194	Ap 211	De 173	184	161	23		935			
10 Paper and wood pulp.....	57	7,878	1	100	210	40	7,467	De 7,716	Ja 7,161	7,629	6,655	958	13	3	136,903		
11 Paper goods, not elsewhere specified.	11	380	5	17	22	7	329	De 346	Je 319	344	201	124	3	16	744		
12 Patent medicines and compounds and druggists' preparations.	62	616	53	50	173	71	269	No 301	Jy 230	313	112	196	3	2	219		
13 Pens, fountain, stylographic, and gold	5	94	2	6	21	18	47	Jy ² 48	Ja 46	48	47	1		18			
14 Photo-engraving.....	10	232	9	17	14	21	171	Ja ² 179	Jy 161	175	161	5	0	66			
15 Printing and publishing.....	833	7,890	864	340	905	382	5,360	De 5,632	Jy 5,246	5,638	3,878	1,449	204	107	5,293		
16 Shipbuilding, including boat building	52	1,023	52	22	33	10	906	De 1,105	Mh 795	1,150	1,146	2	2	3,506			
17 Signs and advertising novelties.....	3	64		6	20	2	36	Au 41	Fe ² 34	38	22	13	3	52			
18 Slaughtering and meat packing.....	48	2,203	56	41	216	00	1,880	Ja 2,600	Se 1,612	1,776	1,656	91	27	2	3,283		
19 Stoves and furnaces, including gas and oil stoves.	12	2,116	1	46	218	48	1,803	Se 1,900	Ja 1,451	1,716	1,663		53	1,631			
20 Surgical appliances and artificial limbs	9	49	9	6	2	4	28	Au 35	Ja ² 22	29	12	17		12			
21 Tobacco manufactures.....	775	3,380	831	48	95	15	2,391	De 2,460	Je 2,322	2,530	1,851	666	13		286		
22 Woolen, worsted, and felt goods, and wool hats.	33	1,178	23	47	53	9	1,046	Je 1,116	Oc 975	1,116	452	597	25	42	3,059		
23 All other industries *.....	522	11,279	476	448	914	241	9,200							24,834			

¹ Same number reported throughout the year.
² Same number reported for one or more other months.
* All other industries embrace—

Artificial flowers and feathers and plumes.....	1	Charcoal.....	3	Flavoring extracts.....	11
Awnings, tents, and sails.....	10	Chocolate and cocoa products.....	1	Foundry supplies.....	1
Axle grease.....	1	Clocks and watches, including cases and materials.....	1	Fuel, manufactured.....	1
Babbitt metal and solder.....	2	Clothing, horse.....	5	Furs, dressed.....	8
Bags, other than paper.....	3	Clothing, men's, buttonholes.....	2	Galvanizing.....	1
Bags, paper.....	2	Coffee and spice, roasting and grinding.....	0	Glass.....	1
Baking powders and yeast.....	1	Coke.....	2	Glass, cutting, staining, and ornamenting.....	13
Baskets, and rattan and willow ware.....	4	Cordials and sirups.....	1	Glucose and starch.....	1
Beet sugar.....	4	Cork, cutting.....	1	Glue.....	2
Belt and hose, leather.....	2	Cotton goods, including cotton small wares.....	3	Gold and silver, reducing and refining, not from the ore.....	1
Boycles, motorcycles, and parts.....	5	Drug grinding.....	1	Graphite and graphite refining.....	1
Billiard tables and materials.....	1	Dyestuffs and extracts.....	1	Grease and tallow.....	11
Boots and shoes, rubber.....	1	Emery and other abrasive wheels.....	2	Hair work.....	1
Butter, reworking.....	1	Enameling and japanning.....	2	Hammocks.....	3
Carpets and rugs, other than rag.....	1	Engraving and diesinking.....	2	Hand stamps and stencils and brands.....	4
Carriages and sleds, children's.....	0	Explosives.....	1	Hats, straw.....	1
Cars, steam-railroad, not including operations of railroad companies.....	2	Fertilizers.....	1	House-furnishing goods, not elsewhere specified.....	3
Cash registers and calculating machines.....	1	Files.....	2	Ice, manufactured.....	3
Cement.....	1	Fire extinguishers, chemical.....	1	Ink, writing.....	1
		Flags, banners, regalia, society badges, and emblems.....	3		

MANUFACTURES—WISCONSIN.

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STATE, BY INDUSTRIES: 1909—Continued.

	EXPENSES.										Value of products.	Value added by manufacture.	
	Capital.	Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.			Other.
1	\$3,743,141	\$3,571,179	\$108,738	\$87,000	\$1,826,537	\$72,743	\$1,144,258	\$14,279	\$18,182	\$7,785	\$291,657	\$4,113,805	\$2,886,904
2	1,632,706	1,345,240	43,435	42,599	241,262	15,302	843,079	6,322	7,009	11,117	135,115	1,443,505	585,184
3	319,141	519,368	13,748	6,209	146,829	5,117	332,490	2,067	1,718	-----	11,190	556,449	218,842
4	138,038	279,203	14,028	526	48,948	4,411	194,999	3,080	504	-----	12,707	315,940	116,530
5	168,716	151,080	10,132	8,109	65,222	5,094	40,860	5,137	600	1,767	14,169	185,432	139,478
6	6,130	4,982	-----	-----	1,980	42	2,469	360	8	-----	123	11,241	8,730
7	753,643	820,820	34,647	19,594	202,223	9,373	480,788	8,100	4,228	394	61,473	892,957	402,796
8	23,282	40,409	1,800	5,704	11,564	617	13,193	4,940	312	-----	2,279	52,338	35,528
9	1,260,288	1,352,236	45,938	47,153	99,127	15,173	1,027,500	4,836	4,760	71	107,672	1,525,896	483,223
10	33,737,744	22,746,568	484,297	246,771	3,891,469	1,616,021	15,076,544	2,060	299,600	23,104	1,106,632	25,962,099	9,269,534
11	598,413	867,576	48,630	18,268	121,790	9,450	585,672	11,423	3,125	-----	69,218	987,897	392,775
12	1,288,435	1,337,766	91,508	188,965	118,242	5,743	439,353	15,252	4,221	27,967	451,515	1,706,879	1,261,783
13	254,316	229,703	10,200	20,150	22,309	1,019	121,063	1,368	372	-----	53,222	248,311	126,229
14	115,683	272,814	25,223	21,649	130,205	5,596	39,481	7,967	320	13,096	28,277	312,180	266,103
15	10,763,425	9,893,531	628,645	876,191	2,913,124	150,555	3,235,501	228,581	55,674	360,593	1,414,752	11,860,644	8,474,588
16	3,024,769	1,542,163	41,615	27,435	540,181	36,288	752,250	2,456	18,587	1,872	91,484	1,899,022	1,081,084
17	47,840	65,416	5,935	8,652	14,384	1,985	24,653	360	157	300	8,990	76,541	49,903
18	6,629,094	25,843,288	114,105	271,467	1,041,772	130,301	23,273,134	31,060	23,894	10,000	947,550	27,216,864	3,813,429
19	3,985,662	3,302,892	90,198	219,807	1,002,684	62,534	1,506,417	3,875	18,833	573	400,971	3,737,206	2,188,255
20	69,016	92,531	7,200	1,965	10,889	729	52,350	3,037	294	120	15,947	100,731	47,652
21	2,995,217	5,123,009	80,442	106,209	1,106,095	26,586	2,480,823	59,168	704,696	389	558,601	6,141,785	3,634,377
22	2,573,827	2,000,125	73,570	62,681	380,927	47,291	1,328,566	3,812	14,852	-----	98,126	2,229,708	853,851
23	37,199,304	31,592,068	850,773	802,241	4,459,573	2,192,242	17,362,522	92,903	2,425,964	43,181	3,273,269	36,463,905	16,909,141

^a All other industries embrace—Continued.

Instruments, professional and scientific.....	4	Paving materials.....	1	Stereotyping and electrotyping.....	2
Iron and steel, bolts, nuts, washers, and rivets, not made in steel works or rolling mills.....	1	Photographic apparatus and materials.....	3	Straw goods, not elsewhere specified.....	1
Iron and steel forgings.....	1	Pottery, terra-cotta, and fire-clay products.....	3	Toys and games.....	3
Iron and steel, nails and spikes, cut and wrought, including wire nails, not made in steel works or rolling mills.....	1	Pumps, not including steam pumps.....	1	Type founding and printing materials.....	2
Kaolin and ground earths.....	2	Rubber goods, not elsewhere specified.....	3	Umbrellas and canes.....	3
Lead, bar, pipe, and sheet.....	1	Safes and vaults.....	1	Upholstering materials.....	14
Liquors, distilled.....	4	Sand and emery paper and cloth.....	1	Vault lights and ventilators.....	1
Liquors, vinous.....	1	Scales and balances.....	2	Vinegar and cider.....	7
Looking-glass and picture frames.....	5	Screws, machine.....	1	Wall paper.....	1
Matches.....	1	Shoddy.....	1	Wall plaster.....	3
Mats and matting.....	2	Show cases.....	1	Washing machines and clothes wringers.....	2
Mineral and soda waters.....	169	Smelting and refining, zinc.....	1	Wheelbarrows.....	7
Mucilage and paste.....	3	Smelting and refining, not from the ore.....	1	Windmills.....	1
Oil, essential.....	2	Soap.....	10	Window shades and fixtures.....	2
Oil, linseed.....	1	Soda-water apparatus.....	1	Wire.....	18
Oil, not elsewhere specified.....	7	Sporting and athletic goods.....	2	Wirework, including wire rope and cable.....	18
Paper patterns.....	1	Springs, steel, car and carriage.....	2	Wood distillation, not including turpentine and rosin.....	1
		Stationery goods, not elsewhere specified.....	2	Wood, turned and carved.....	24
		Statuary and art goods.....	6		
		Steam packing.....	4		

WYOMING.

INDUSTRIES IN GENERAL.

General character of the state.—Wyoming, with a land area of 97,575 square miles, ranks eighth in area among the states and territories of continental United States. Its population in 1910 was 145,965, as compared with 92,531 in 1900 and 62,555 in 1890. It ranked forty-eighth among the 49 states and territories as regards population both in 1910 and 1900.

The state has but one city having a population of over 10,000, Cheyenne, with a population of 11,320. The density of population for the entire state is 1.5 per square mile, the corresponding figure for 1900 being 1. There are no navigable streams in the state, and railroad facilities are limited.

Importance and growth of manufactures.—The manufactures of Wyoming are not of great importance, the

number of establishments reported and the variety of industries represented being small.

More than two-thirds of the entire increase in the value of products reported for the past five years was due to the growth in the output of less than twenty of the establishments. Outside of them, the remainder of the establishments, which are distributed throughout the state, are comparatively small and all practically are engaged in manufacturing for local consumption.

The following table gives the more important figures relative to all classes of manufactures combined for the state as returned at the censuses of 1909, 1904, and 1899, together with percentages of increase from census to census.

	NUMBER OR AMOUNT.			PER CENT OF INCREASE. ¹	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	268	169	139	58.6	21.6
Persons engaged in manufactures.....	3,393	2,163	(²)	56.9	.....
Proprietors and firm members.....	263	150	(²)	75.3	.....
Salaried employees.....	263	179	87	46.9	105.7
Wage earners (average number).....	2,867	1,834	2,060	56.3	-11.0
Primary horsepower.....	7,628	3,604	3,820	111.7	-5.7
Capital.....	\$6,195,000	\$2,696,000	\$2,048,000	129.8	31.6
Expenses.....	5,594,000	3,189,000	2,825,000	75.4	12.9
Services.....	2,392,000	1,467,000	1,300,000	63.1	12.8
Salaries.....	311,000	206,000	91,000	51.0	126.4
Wages.....	2,081,000	1,261,000	1,209,000	65.0	4.3
Materials.....	2,608,000	1,301,000	1,370,000	100.5	-5.0
Miscellaneous.....	594,000	421,000	155,000	41.1	171.6
Value of products.....	6,249,000	3,523,000	3,269,000	77.4	7.8
Value added by manufacture (value of products less cost of materials).....	3,641,000	2,222,000	1,899,000	63.9	17.0

¹ A minus sign (—) denotes decrease.

² Figures not available.

In 1909 the state of Wyoming had 268 manufacturing establishments, which gave employment to an average of 3,393 persons during the year and paid out \$2,392,000 in salaries and wages. Of the persons employed, 2,867 were wage earners. These establishments turned out products to the value of \$6,249,000, to produce which materials costing \$2,608,000 were consumed. The value added by manufacture was thus \$3,641,000, which figure, as explained in the Introduction, best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that the manufacturing industries of Wyoming as a whole showed a greater development during the five-year

period 1904-1909 than during the period 1899-1904. During the more recent period the total number of establishments in the state increased 58.6 per cent and the average number of wage earners 56.3 per cent, while the value of products increased 77.4 per cent and the value added by manufacture 63.9 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume during the period 1904-1909 to the extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the prices of commodities.

The relative importance and growth of the leading manufacturing industries of the state are shown in the next table.

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE, ¹			
		Average number.	Percent distribution.	Amount.	Percent distribution.	Amount.	Percent distribution.	Value of products.		Value added by manufacture.	
								1904-1909	1899-1904	1904-1909	1899-1904
All industries	268	2,887	100.0	\$6,249,000	100.0	\$3,641,000	100.0	77.4	7.1	63.9	17.0
Cars and general shop construction and repairs by steam-railroad companies	9	1,690	58.9	2,337,000	37.4	1,629,000	44.7	42.5	40.2	47.2	60.4
Lumber and timber products	63	648	22.6	751,000	12.0	553,000	15.2	61.5	-38.5	37.9	-25.6
Flour-mill and gristmill products	13	29	1.0	746,000	11.9	163,000	4.5	162.7	34.0	160.8	10.1
Printing and publishing	65	162	5.6	490,000	7.8	400,000	11.0	86.5	86.3	53.3	94.8
Butter, cheese, and condensed milk	4	20	0.7	269,000	4.3	58,000	1.6	126.0	.....	205.3	.....
Bread and other bakery products	33	33	1.3	239,000	3.8	107,000	2.9	162.6	435.3	174.4	387.5
Liquors, malt	3	27	0.9	227,000	3.6	181,000	5.0	320.4	1.9	364.1	-4.9
All other industries	78	253	8.8	1,190,000	19.0	550,000	15.1	.....	.....	.....	.....

¹ Percentages are based on figures in Table I; a minus sign (-) denotes decrease. Where the percentages are omitted, comparable figures can not be given.

It should be borne in mind, in considering this table, that the value of products in some of the industries involves a certain amount of duplication due to the use of the products of one establishment as material for another establishment.

The most important industries listed in this table, in which they are arranged in the order of the value of products, call for brief consideration.

Cars and general shop construction and repairs by steam-railroad companies.—This industry, first in importance in the state, represents the work done in the car shops operated by steam-railroad companies and is exclusive of minor repairs in roundhouses. The operations of the industry consist almost wholly of repairs to the rolling stock and equipment of the companies reporting. Employment was given on an average to 1,690 wage earners, or 58.9 per cent of the total for the state, and the value of products, \$2,337,000, formed 37.4 per cent of the corresponding total for all industries. In 1909 the value added by manufacture for this industry alone represented 44.7 per cent of the total for the state.

Lumber and timber products.—This industry, which not only embraces establishments engaged in logging, but sawmills and planing mills during the five-year period 1899-1904 showed a decrease in value of products and value added by manufacture, but during the more recent period, 1904-1909, the industry practically regained all it had lost in 1904, as compared with 1899.

Flour-mill and gristmill products.—The value of products for this industry in 1909 represented 11.9 per cent of the total value of products for the state. Owing to the comparatively simple processes involved in this industry and the extent to which they are carried on by machinery, the value added by manufacture is not commensurate with the gross value of products or the number of establishments.

Printing and publishing.—In 1909 the establishments classified under this head included 61 establishments publishing newspapers and periodicals and 4 establishments doing book and job work exclusively.

Measured by value added by manufacture the four leading industries held generally the same relative rank as when measured by value of products, though printing and publishing becomes third in order instead of flour-mill and gristmill products, which, in turn, becomes fifth.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture. The malt-liquor industry showed a greater rate of increase from 1904 to 1909 in both value of products and value added by manufacture than any other of the specified industries, namely, 320.4 per cent and 364.1 per cent, respectively. Remarkable increases both in gross value of products and in value added by manufacture are also shown for the bakeries, the creameries, and the flour mills and gristmills. All of the industries specified showed an increase in value of products and value added by manufacture from 1904 to 1909. From 1899 to 1904 however, the lumber industry showed a decrease in both items and the malt-liquor industry in value added by manufacture.

In addition to the seven industries presented separately there are five industries each of which had a value of products in 1909 in excess of \$100,000. They are included under the head of "All other industries" either because, if they were shown separately, the operations of individual establishments would be disclosed, or because comparable statistics for the different census years were not available. These five industries comprise the manufacture of brooms, leather goods, wall plaster, and also the steel works and rolling mills and the slaughtering and meat-packing establishments.

Persons engaged in manufacturing industries.—The following table shows the distribution of the number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age. It should be borne in mind, however, that the sex and age classification of the average number of wage earners in this and other tables is an estimate obtained by the method described in the Introduction.

MANUFACTURES—WYOMING.

1365

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	3,393	3,313	80
Proprietors and officials.....	370	361	9
Proprietors and firm members.....	263	257	6
Salaried officers of corporations.....	19	19	0
Superintendents and managers.....	88	85	3
Clerks.....	156	131	25
Wage earners (average number).....	2,867	2,821	46
16 years of age and over.....	2,855	2,810	45
Under 16 years of age.....	12	11	1

The average number of persons engaged in manufactures during 1909 was 3,393. Of these, 2,867 were wage earners. About 70 per cent of the remainder were proprietors and officials and the rest were clerks. Corresponding figures for individual industries will be found in Table II.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, and the total number of persons employed in manufactures. It covers all industries combined and four important industries individually.

INDUSTRY.	PERSONS ENGAGED IN MANUFACTURES.			
	Total number.	Per cent of total.		
		Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	3,393	10.9	4.6	84.5
Cars and general shop construction and repairs by steam-railroad companies.....	1,806	1.4	5.0	93.6
Flour-mill and gristmill products.....	45	28.9	6.7	64.4
Lumber and timber products.....	766	13.4	2.0	84.6
Printing and publishing.....	275	32.4	8.7	58.9
All other industries.....	501	27.9	4.6	67.5

Of the total number of persons engaged in all manufacturing industries, 10.9 per cent were proprietors and officials, 4.6 per cent clerks, and 84.5 per cent wage earners. In the printing and publishing and the flour-mill and gristmill industries the majority of the establishments are comparatively small and the work is done largely by the proprietors or their immediate representatives. Therefore the proportion of persons engaged in the industry falling in the class of proprietors and officials is very much higher than for most other industries or for all industries combined. The smallest proportion for this class is shown for the railroad repair shops, and is due to the fact that corporations which operate these establishments report no proprietors, in addition to which general officials are not as a rule assigned to the supervision of this particular branch of work.

The following table shows, for 1909, in percentages, for all industries combined the distribution of the average number of wage earners by age periods and sex, calculated in the manner described in the Introduction. It also shows, for some of the important industries

separately, the percentage distribution, by age periods and sex, of wage earners as reported for December 15, or the nearest representative day. As a means of judging the importance of the several industries the average number employed for the year is also given in each case.

INDUSTRY.	WAGE EARNERS.			
	Average number. ¹	Per cent of total.		
		16 years of age and over.		Under 16 years of age.
Male.	Female.			
All industries.....	2,867	98.0	1.6	0.4
Cars and general shop construction and repairs by steam-railroad companies.....	1,690	100.0		
Flour-mill and gristmill products.....	29	100.0		
Lumber and timber products.....	648	98.4	0.2	0.6
Printing and publishing.....	162	74.1	21.0	4.9
All other industries.....	338	96.7	3.0	0.3

¹ For method of estimating the distribution, by sex and age periods, of the average number in all industries combined, see Introduction.

Of the 2,867 wage earners, 98.4 per cent were male and 1.6 per cent female; 99.6 per cent were 16 years of age and over and but four-tenths of 1 per cent under 16 years.

The largest number of women and children are employed in the printing and publishing industry. Of the 162 wage earners shown in that industry 120 were males and 34 were females 16 years of age and over and 8 were males under 16 years of age.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown in the census of 1904, it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1904		Per cent of increase, 1904-1909.
	Number.	Percent distribution.	Number.	Percent distribution.	
Total.....	3,393	100.0	2,163	100.0	58.9
Proprietors and firm members.....	263	7.8	150	6.9	75.3
Salaried employees.....	263	7.8	179	8.3	46.9
Wage earners (average number)....	2,867	84.5	1,834	84.8	56.3

Comparable figures are not obtainable for 1899. The table shows a greater percentage of increase in the proprietors and firm members than in either of the other two classes. This is due probably to the fact that the increase in the number of establishments was mostly in small establishments operated under individual ownership in which practically all work is performed by the proprietors.

The next table shows the average number of wage earners, distributed according to age periods, and in the case of those 16 years of age and over according to sex, for 1909, 1904, and 1899. The averages

for 1909 are estimated on the basis of the actual number reported for a single representative day. (See Introduction.)

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.					
	1909		1904		1899	
	Number.	Percent distribution.	Number.	Percent distribution.	Number.	Percent distribution.
Total.....	2,867	100.0	1,834	100.0	2,069	100.0
16 years of age and over..	2,855	99.6	1,826	99.0	2,045	99.3
Male.....	2,810	98.0	1,793	97.8	2,030	98.5
Female.....	45	1.6	33	1.8	15	0.7
Under 16 years of age....	12	0.4	8	0.4	15	0.7

This table indicates that for all industries combined there has been very little change during the 10 years in the employment of women and children. In 1909 males 16 years of age and over formed 98 per cent of all wage earners, as compared with 97.8 per cent in 1904 and 98.5 per cent in 1899.

Wage earners employed, by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for the lumber industry, and for all other industries combined; it also gives the percentage which the number reported for each month is

of the greatest number reported for any month. In Table II, page 1372, is shown, for each industry in the state, the largest number and also the smallest number of employees reported for any month. The number for each month relates to the 15th day, or the nearest representative day, of the month.

While the lumber industry is conducted throughout the year in Wyoming, yet on account of climatic conditions it is to a certain extent a seasonal industry, giving employment to a larger number of persons during the summer months. It is the second industry of the state in respect to the number of wage earners employed, and the variation in its totals affects to a considerable extent the total for all industries combined. From 439 wage earners in February the number in this industry increased steadily until September, when it reached 815, the largest number employed in any one month. When the two branches of this industry are considered separately, the table shows that both in the mills and in logging operations the largest number of wage earners was employed during the month of September. In the mills the smallest number was employed in March, while January shows the smallest number employed in logging operations. Outside the lumber industry the number of wage earners varies from a minimum of 2,042 in February to a maximum of 2,437 in December.

MONTH.	WAGE EARNERS.									
	All industries.		Lumber and timber products.						All other industries.	
			Total.		In mills.		In logging operations.			
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	2,496	79.6	441	54.1	124	36.5	317	66.7	2,055	84.3
February.....	2,481	79.1	439	53.9	115	33.8	324	68.2	2,042	83.8
March.....	2,642	84.2	505	69.3	109	32.1	456	96.0	2,077	85.2
April.....	2,642	84.2	587	72.0	163	47.9	424	89.3	2,055	84.3
May.....	2,783	88.7	622	76.3	190	57.6	426	89.7	2,161	88.7
June.....	2,983	95.1	715	87.7	259	76.2	456	96.0	2,208	93.1
July.....	2,967	94.3	749	91.9	286	84.1	463	97.5	2,208	90.6
August.....	3,042	97.0	790	96.9	321	94.4	469	98.7	2,252	92.4
September.....	3,132	99.8	815	100.0	340	100.0	475	100.0	2,317	95.1
October.....	3,081	96.6	722	88.6	262	77.1	460	96.8	2,309	94.7
November.....	3,137	100.0	705	86.5	240	70.6	465	97.9	2,432	98.8
December.....	3,065	97.7	628	77.1	163	47.9	465	97.9	2,437	100.0

Prevailing hours of labor.—In the following table wage earners have been classified according to hours of labor prevailing in the establishments in which they are employed. In making this classification the average number of wage earners employed during

the year is used, and the number employed in each establishment is classified as a total, according to the hours prevailing in that establishment, even though some few employees work a greater or less number of hours.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	2,867	228	34	203	19	782	1,566	35	.....
Cars and general shop construction and repairs by steam-railroad companies.....	1,690	.....	13	136	.....	.....	1,541	.....	.....
Flour-mill and gristmill products.....	29	3	.....	.....	.....	26	.....	.....	.....
Lumber and timber products.....	648	8	10	6	4	611	.....	.....	.....
Printing and publishing.....	162	94	11	35	6	16	.....	.....	.....
All other industries.....	338	123	.....	26	9	129	16	35	.....

It is evident from these figures that for the great majority of the wage earners employed in the manufacturing industries of Wyoming the prevailing hours of labor range from 60 to 72 a week, or from 10 to 12 a day, only 16.9 per cent of the total being employed in establishments operating less than 10 hours a day. There were no establishments operating more than 72 hours a week.

Of the total number of wage earners, 58.9 per cent were employed in the railroad repair shops. Practically all of these shops operate between 60 and 72 hours per week. The lumber industry is mainly on a 10-hour-per-day basis.

Location of establishments.—The next table shows to what extent manufacturing in the state is carried on in the city of Cheyenne. (See Introduction.)

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			Cheyenne.	Outside districts.	Cheyenne.	Outside districts.
Population.....	1910 1900	145,905 92,531	11,320 14,087	134,645 78,444	7.8 15.2	92.2 84.8
Number of establishments.	1909 1904 1899	268 169 139	22 18 17	246 151 122	8.2 10.7 12.2	91.8 89.3 87.8
Average number of wage earners.	1909 1904 1899	2,867 1,834 2,060	853 552 423	2,014 1,282 1,637	29.8 30.1 20.5	70.2 69.9 79.5
Value of products..	1909 1904 1899	\$6,249,078 3,523,260 3,268,655	\$1,577,023 924,697 722,457	\$4,672,055 2,598,563 2,546,098	25.2 26.2 22.1	74.8 73.8 77.9
Value added by manufacture.	1909 1904 1899	3,640,889 2,222,487 1,898,825	969,949 616,975 433,909	2,670,940 1,605,512 1,464,916	26.6 27.8 22.9	73.4 72.2 77.1

The figures in this table indicate that comparatively little change has taken place during the two intercensal periods. Although the city of Cheyenne shows a small relative increase as measured by value of products, value added by manufacture, and average number of wage earners for the 10-year period, there was a decrease in these items in 1909, as compared with 1904. In 1909 this city, with 8.2 per cent of the total number of establishments in the state and 29.8 per cent of the average number of wage earners, produced 25.2 per cent of the total value of products. With the exception of the car shops, which in 1909 gave employment to almost nine-tenths of the total average number of wage earners reported for all manufacturing industries in the city, the establishments are only such as are necessary to meet local requirements.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. For all industries combined comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available. Figures for 1909 only are presented for two important industries. In order to avoid disclosing the operations of individual con-

cerns it is necessary to omit two important industries from this table and the one following.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	268	2,867	\$6,249,078	\$3,640,889
1904.....	169	1,834	3,523,260	2,222,487
Individual:				
1909.....	151	378	924,093	585,561
1904.....	86	146	555,377	284,505
Firm:				
1909.....	49	80	659,235	211,926
1904.....	28	47	216,525	106,663
Corporation:				
1909 ¹	68	2,409	4,664,800	2,833,402
1904 ¹	55	1,641	2,751,353	1,836,259
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	56.3	13.2	14.8	16.1
1904.....	50.9	8.0	15.8	12.8
Firm:				
1909.....	18.3	2.8	10.6	6.0
1904.....	16.6	2.6	6.1	4.6
Corporation:				
1909 ¹	25.4	84.0	74.6	78.0
1904 ¹	32.5	89.5	78.1	82.6
Lumber and timber products,				
1909.....	63	648	\$761,249	\$552,744
Individual.....	39	205	239,440	196,067
Firm.....	20	45	70,416	51,899
Corporation.....	4	898	450,893	305,779
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	61.9	31.6	30.7	35.4
Firm.....	31.7	6.9	9.4	9.4
Corporation.....	6.3	61.4	60.0	55.2
Printing and publishing, 1909.....	65	162	\$489,544	\$399,472
Individual.....	37	64	158,439	134,776
Firm.....	9	12	51,684	34,913
Corporation.....	19	86	279,421	229,783
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	56.9	39.5	32.4	33.7
Firm.....	13.8	7.4	10.6	8.7
Corporation.....	29.2	53.1	57.1	57.5

¹ Includes the group "Other," to avoid disclosure of individual operations.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 25.4 per cent of the total number of establishments were in 1909 under corporate ownership, as against 74.6 per cent under all other forms. The corresponding figures for 1904 were 32.5 per cent and 67.5 per cent, respectively. This large decrease in the proportion of establishments operated by corporations was accompanied by a decrease in the proportion of the total average number of wage earners, value of products, and value added by manufacture reported by such establishments. The decrease in the relative importance of the number of establishments under corporate ownership is due principally to the large increase during the five-year period in the number of establishments operated by individuals, namely, from 86, or 50.9 per cent of the total, in 1904 to 151, or 56.3 per cent of the total, in 1909.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it the table which follows groups the establishments according to the value of their products.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	268	2,867	\$5,249,078	\$3,640,889
1904.....	169	1,834	3,523,260	2,222,487
Less than \$5,000:				
1909.....	141	161	343,444	242,297
1904.....	74	72	180,100	130,534
\$5,000 and less than \$20,000:				
1909.....	86	231	771,778	480,792
1904.....	64	202	562,958	350,248
\$20,000 and less than \$100,000:				
1909.....	24	260	913,075	494,471
1904.....	23	229	950,524	427,925
\$100,000 and less than \$1,000,000:				
1909.....	17	2,215	4,220,781	2,414,329
1904.....	8	1,331	1,820,678	1,304,480
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	52.6	5.6	5.5	6.7
1904.....	43.8	3.9	5.1	5.9
\$5,000 and less than \$20,000:				
1909.....	32.1	8.1	12.4	13.5
1904.....	37.9	11.0	16.0	16.2
\$20,000 and less than \$100,000:				
1909.....	9.0	9.1	14.6	13.6
1904.....	13.6	12.5	27.0	19.3
\$100,000 and less than \$1,000,000:				
1909.....	6.3	77.3	67.5	66.3
1904.....	4.7	72.0	51.9	58.7
Average per establishment:				
1909.....		11	\$23,817	\$13,585
1904.....		11	20,848	13,151
Lumber and timber products,				
1909.....	63	648	\$751,249	\$553,744
Less than \$5,000.....	48	77	93,200	73,993
\$5,000 and less than \$20,000.....	11	52	94,292	67,553
\$100,000 and less than \$1,000,000.....	4	519	563,757	412,198
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	73.2	12.0	12.4	13.4
\$5,000 and less than \$20,000.....	17.5	8.0	12.6	12.2
\$100,000 and less than \$1,000,000.....	6.3	80.0	75.0	74.4
Average per establishment:				
1909.....		10	11,925	8,790
Printing and publishing, 1909.....	65	162	\$489,544	\$399,472
Less than \$5,000.....	36	44	99,321	83,383
\$5,000 and less than \$20,000.....	24	75	219,923	170,130
\$20,000 and less than \$100,000.....	5	43	170,300	136,959
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	55.4	27.2	20.3	20.9
\$5,000 and less than \$20,000.....	36.9	45.3	44.9	44.8
\$20,000 and less than \$100,000.....	7.7	20.5	34.8	34.3
Average per establishment:				
1909.....		2	\$7,531	\$6,146

¹ Includes the group "\$1,000,000 and over."
² Includes the group "\$20,000 and less than \$100,000."

The table also shows the average size of establishments for all industries combined and for two impor-

tant industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the last two censuses, while for two important industries figures are given for 1909 only.

This table shows that, in 1909, of the 268 manufacturing establishments in the state, only 17, or 6.3 per cent, had a value of products exceeding \$100,000. These establishments, however, employed an average of 2,215 wage earners, or 77.3 per cent of the total number in all establishments, and reported 67.5 per cent of the total value of products and 66.3 per cent of the total value added by manufacture.

On the other hand, small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (52.6 per cent) of the total number of establishments, but the value of their products amounted to only 5.5 per cent of the total. The great bulk of the manufacturing was carried on in establishments whose products were not less than \$100,000 in value.

The five years from 1904 to 1909 witnessed a marked gain in the relative importance of the larger establishments as measured by value of products, the proportion of the total value of products for the state reported by such establishments increasing from slightly more than one-half to a little more than two-thirds.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The next table shows such a classification for all industries combined and for four important industries, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	1 to 5 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	268	40	191	25	1	2	8		1	
Cars and general shop construction and repairs by steam-railroad companies.....	9			2	1	1	5		1	
Flour-mill and gristmill products.....	13	3	9	1						
Lumber and timber products.....	63	2	53	5			3			
Printing and publishing.....	65	7	52	6						
All other industries.....	118	28	77	11	1	1				
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	2,867		364	239	34	130	1,347		753	
Cars and general shop construction and repairs by steam-railroad companies.....	1,690		20	20		74	843		753	
Flour-mill and gristmill products.....	29		20	9						
Lumber and timber products.....	648		94	50			504			
Printing and publishing.....	162		112	50						
All other industries.....	338		138	110	34	56				
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0		12.7	8.3	1.2	4.5	47.0		26.3	
Cars and general shop construction and repairs by steam-railroad companies.....	100.0			1.2		4.4	49.9		44.0	
Flour-mill and gristmill products.....	100.0		69.0	31.0						
Lumber and timber products.....	100.0		14.5	7.7			77.8			
Printing and publishing.....	100.0		69.1	30.9						
All other industries.....	100.0		40.8	32.5	10.1	16.6				

The per cent distribution of the number of establishments is not shown in this table; of the 268 establishments reported for all industries combined, 95.5 per cent of the establishments employed no wage earners at all or under 21 wage earners each, leaving but 4.5 per cent that employed more than that number. The most numerous single group consists of the 191 establishments employing from 1 to 5 wage earners, the next being the 40 establishments having no wage earners. There were 9 establishments that employed over 100 wage earners; only 1 employed over 500.

Of the total number of wage earners, 73.3 per cent were in establishments employing over 100 wage earners. The largest number of employees was in the group employing from 101 to 250 wage earners. This group, which is made up of the railroad repair-shop and the lumber industries, employed 1,347 wage earners, or 47 per cent of the total.

Expenses.—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses going to make up the total.

The table following shows, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

This table shows that, for all industries combined, 46.6 per cent of the total expenses was incurred for materials, 42.8 per cent for services—that is, salaries and wages—and but 10.6 per cent for other purposes. As would be expected, these proportions vary greatly in the different industries.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	5.6	37.2	46.6	10.6
Cars and general shop construction and repairs by steam-railroad companies.....	5.4	56.0	30.3	8.2
Flour-mill and gristmill products.....	1.7	3.3	90.9	4.1
Lumber and timber products.....	8.1	50.4	31.7	9.8
Printing and publishing.....	15.5	40.8	28.1	17.6
All other industries.....	4.2	17.9	62.5	15.5

Engines and power.—The table following shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric

motors operated by purchased current), and their total horsepower at the censuses of 1909, 1904, and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

During the period 1904-1909 there was an increase in all classes of primary power shown separately in the table except that generated by water motors, the totals for which are comparatively insignificant. At each of the three censuses steam is shown to be the predominant primary power, in 1909 representing nearly seven-eighths of the total. Of the total increase in primary power (1904 to 1909) 93.3 per cent was steam.

POWER.	NUMBER OF ENGINES OR MOTORS.			HORSEPOWER.			PER CENT DISTRIBUTION OF HORSEPOWER.		
	1909	1904	1899 ⁽¹⁾	1909	1904	1899 ¹	1909	1904	1899
Primary power, total.....	268	109	97	7,628	3,604	3,820	100.0	100.0	100.0
Owned.....	184	109	97	7,114	3,558	3,813	93.3	98.7	99.8
Steam.....	128	69	69	6,467	2,712	3,184	84.8	75.2	83.4
Gas and oil.....	37	24	14	182	88	42	2.4	2.4	1.1
Water wheels.....	14	12	14	456	372	534	6.0	10.3	14.0
Water motors.....	5	4	(²)	9	10	(²)	0.1	0.3	.....
Other.....					376	53		10.4	1.4
Rented—Electric.....	84	(²)	(²)	514	46	7	6.7	1.3	0.2
Electric motors.....	108	11	8	801	132	87	100.0	100.0	100.0
Run by current generated by establishment.....	24	11	8	287	86	80	35.8	65.2	92.0
Run by rented power.....	84	(²)	(²)	514	46	7	64.2	34.8	8.0

¹ Includes the neighborhood industries and hand trades, omitted in 1904 and 1909.
² Not reported.

Fuel.—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. The following table shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
All industries.....	621	590,915	307	1,137	1,356	100
Cars and general shop construction and repairs by steam-railroad companies.....	4	552,801	108	151	973	.....
Flour-mill and gristmill products.....		8,007		19		.....
Lumber and timber products.....		184			4	.....
Printing and publishing.....		565		47	137	100
All other industries.....	617	29,368	199	920	242	.....

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries and custom sawmills.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products which do not appear on the general schedule. Data for three important industries in Wyoming are here presented.

Lumber and timber products.—Measured by value of products, the lumber industry is second in importance in Wyoming. The following is a statement of the quantity of products of the sawmills, by classes, reported at the censuses of 1909 and 1899:

PRODUCT.	1909	1899
Rough lumber.....M feet b. m.	28,602	16,003
Lath.....thousands..	1,224	629
Shingles.....thousands..	860	2,185

Rough lumber and lath each show a large increase in quantity during the decade covered by this table, but for shingles a decrease is shown. The values reported for both lath and shingles are, however, small, and these products are of comparatively little importance. In 1909 the cut of rough lumber consisted almost entirely of softwoods, chiefly western pine and lodgepole pine.

Flour-mill and gristmill products.—The tabular statement following gives the quantity and value of products for this industry for 1909 and 1904.

As shown in the table, white flour is the principal product reported, contributing 66.7 per cent of the total value of all products reported for the industry in 1909 and 79.9 per cent in 1904. Each class of products shows a large relative increase in both quantity and value during this five-year period, but except in the case of white flour, feed, and offal, the figures are comparatively small.

PRODUCT.	QUANTITY.		VALUE.	
	1909	1904	1909	1904
All products.....			\$746,299	\$223,653
Wheat flour.....barrels..	99,537	43,753	505,294	220,754
White.....barrels..	98,056	43,708	497,960	220,604
Graham.....barrels..	1,481	50	7,334	150
Corn meal.....barrels..	1,033	74	4,094	204
Rye flour.....barrels..	500		2,500	
Feed.....tons..	5,108	549	126,992	13,044
Offal.....tons..	4,084	2,300	88,921	43,651
All other products.....			18,498	

Laundries.—Statistics for steam laundries are not included in the general tables. In 1909 there were 14 such establishments in the state of Wyoming, 3 of which were in Cheyenne.

The most common form of organization was the firm, with seven establishments, the individual form having six establishments, and the corporate form one establishment. Two establishments had receipts for the year's business less than \$5,000; eight, \$5,000 but less than \$20,000; four, \$20,000 but less than \$100,000.

The next statement summarizes the statistics.

Number of establishments.....	14
Persons engaged in the industry.....	203
Proprietors and firm members.....	20
Salaried employees.....	12
Wage earners (average number).....	171
Primary horsepower.....	319
Capital.....	\$99,573
Expenses.....	149,361
Services.....	89,303
Materials.....	38,238
Miscellaneous.....	21,820
Amount received for work done.....	216,847

The number of persons employed each month and the per cent which this number represented of the greatest number employed in any one month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	162	87.6	July.....	180	97.3
February.....	159	85.9	August.....	185	100.0
March.....	163	88.1	September.....	179	96.8
April.....	170	91.9	October.....	187	98.3
May.....	174	94.1	November.....	168	90.8
June.....	174	94.1	December.....	172	93.0

The different kinds of primary power, the number of engines or motors, and the horsepower used in 1909 are shown in the following tabular statement:

KIND.	Number of engines or motors.	Horsepower.
Primary power, total.....		319
Owned—Steam.....	10	221
Rented—Electric.....	21	98

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Bituminous coal.....	Tons.....	3,865
Wood.....	Cords.....	16
Oil.....	Barrels.....	32
Gas.....	1,000 feet.....	632

Custom sawmills.—Statistics for custom sawmills are not included in the general tables, but are presented in the following summary:

Number of establishments.....	4
Persons engaged in the industry.....	10
Proprietors and firm members.....	8
Wage earners (average number).....	2
Primary horsepower.....	58
Capital.....	\$4,925
Expenses.....	1,911
Services.....	698
Materials.....	215
Miscellaneous.....	998
Value of products.....	4,960

MANUFACTURES—WYOMING.

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TABLE I.—COMPARATIVE SUMMARY FOR 1909, 1904, AND 1899.
THE STATE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY AND CITY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horsepower.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaries and firm employees.	Wage earners (average number).							
Expressed in thousands.													
STATE—All industries.....	1909	268	3,393	283	263	2,867	7,628	\$6,195	\$311	\$2,081	\$2,608	\$6,249	\$3,641
	1904	169	2,163	150	179	1,834	3,604	2,698	206	1,261	1,301	3,523	2,222
	1899	139	.....	.....	87	2,060	3,820	2,048	91	1,209	1,370	3,269	1,899
Bread and other bakery products.....	1909	33	77	35	4	38	31	124	3	33	132	239	107
	1904	19	38	21	.....	17	7	30	.....	14	62	91	39
	1899	4	10	4	.....	6	.....	3	.....	2	9	17	8
Butter, cheese, and condensed milk.....	1909	4	27	.....	7	20	79	115	11	17	211	269	58
	1904	5	17	3	.....	3	83	38	3	7	95	114	19
	1899	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cars and general shop construction and repairs by steam-railroad companies.....	1909	9	1,806	.....	116	1,690	1,550	2,046	127	1,309	708	2,337	1,629
	1904	9	1,288	.....	70	1,212	1,488	901	91	884	533	1,640	1,107
	1899	7	881	.....	28	863	1,041	592	29	623	480	1,170	690
Flour-mill and gristmill products.....	1909	13	45	7	9	29	885	440	11	21	583	746	163
	1904	11	31	9	6	16	591	222	5	11	219	284	65
	1899	8	.....	.....	8	14	.....	157	10	11	155	211	56
Liquors, malt.....	1909	3	36	1	8	27	172	266	18	25	46	227	181
	1904	3	21	1	5	15	112	167	6	11	15	54	39
	1899	4	24	3	2	19	59	86	2	12	12	53	41
Lumber and timber products.....	1909	63	766	85	33	648	2,251	1,075	50	314	198	751	553
	1904	32	370	41	24	305	707	345	28	151	64	405	401
	1899	34	.....	.....	18	692	.....	502	10	305	217	750	539
Printing and publishing.....	1909	65	275	60	53	162	138	437	54	141	90	490	400
	1904	47	186	38	29	119	96	266	33	84	62	313	261
	1899	40	.....	.....	6	94	.....	156	6	62	34	168	134
All other industries.....	1909	78	301	75	33	253	2,522	1,692	37	221	640	1,190	550
	1904	43	212	37	36	139	520	727	40	99	271	562	291
	1899	42	.....	.....	25	382	.....	552	34	204	463	894	431
CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.													
Cheyenne.....	1909	22	956	12	91	853	1,253	\$1,670	\$111	\$618	\$607	\$1,577	\$970
	1904	18	623	11	60	552	.....	740	66	412	308	925	617
	1899	17	.....	.....	18	423	.....	580	17	341	289	722	438

† Figures can not be shown without disclosing individual operations.

MANUFACTURES—WYOMING.

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.									WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.			Total.	16 and over.		Under 16.			
					Male.	Female.	Average number.	Number.			Male.	Female.	Male.	Female.		
								Maximum month.	Minimum month.							
1 All industries.....	268	3,393	263	107	131	25	2,867	No 3,187	Fe 2,481	(1)	(1)	(1)	(1)	(1)	7,628	
2 Artificial stone.....	6	10	6				4	Je 10	Ja ² 0	20	20					
3 Bread and other bakery products.....	33	77	35	1	2	1	38	Au ³ 46	My ²⁴ 24	44	42	1		1	31	
4 Brick and tile.....	13	47	10	3			34	Jy ⁹⁸ 98	Ja ² 0	103	108				129	
5 Butter, cheese, and condensed milk.....	4	27		4	2	1	20	Au ³ 24	Fe ³ 18	19	16	3			79	
6 Carriages and wagons and materials.....	10	22	14				8	No ³ 9	Jy ³ 6	9	9				10	
7 Cars and general shop construction and repairs by steam-railroad companies.....	9	1,806		25	82	9	1,690	De 1,885	Jy 1,578	1,888	1,888				1,550	
8 Flour-mill and gristmill products.....	13	45	7	6	2	1	29	No 32	Ap 26	30	30				885	
9 Leather goods.....	10	44	8	2			34	Jy ³ 35	Fe ³ 33	34	34				1	
10 Liquors, malt.....	3	36	1	6	2		27	My ³ 29	De ³ 25	25	25				172	
11 Lumber and timber products.....	63	766	85	18	14	1	648	Se 815	Fe 439	803	798	1	4		2,251	
12 Printing and publishing.....	65	275	60	29	15	0	162	Oc 170	Fe ³ 158	170	126	36	8		138	
13 Tobacco manufactures.....	10	29	11				18	Au 21	Fe 14	19	16	3				
14 All other industries ⁴	29	209	26	13	12	3	155								2,382	

¹ No figures given for reasons explained in the Introduction.

² None reported for one or more other months.

³ Same number reported for one or more other months.

⁴ All other industries embrace—

Brooms.....	1	Confectionery.....	2	Gas, illuminating and heating.....	1
Chemicals.....	1	Foundry and machine-shop products.....	2	Iron and steel, steel works and rolling mills.....	1

TABLE III.—DETAIL STATEMENT FOR CITIES OF 50,000 INHABITANTS OR MORE, BY INDUSTRIES;

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

CITY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.									WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners (average number).			Total.	16 and over.		Under 16.			
					Male.	Female.	Total.	16 and over.			Under 16.	Male.	Female.	Male.	Female.	
								Male.	Female.							
1 CHEYENNE.....	22	956	12	25	55	11	853	845	7	1	940	931	8	1	1,253	

MANUFACTURES—WYOMING.

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THE STATE, BY INDUSTRIES: 1909.

Capital.	EXPENSES.											Value of products.	Value added by manufacture.
	Total.	Services.			Materials.		Miscellaneous.						
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$6,195,109	\$5,594,221	\$175,880	\$134,793	\$2,050,763	\$187,286	\$2,420,903	\$33,425	\$55,989	\$19,655	\$465,527	\$6,249,078	\$3,640,889
2	17,210	8,634	.....	.....	3,307	.....	4,831	10	79	102	305	11,364	6,533
3	124,433	180,955	.....	1,965	33,367	.....	6,379	125,705	5,714	996	5,929	239,485	107,401
4	95,690	49,892	.....	1,900	30,341	.....	14,300	140	414	.....	2,221	69,535	54,659
5	115,344	247,325	.....	3,480	17,293	.....	3,859	207,461	160	259	7,583	268,862	57,542
6	32,740	31,239	.....	.....	7,978	.....	577	21,838	360	.....	285	41,624	19,209
7	2,045,541	2,336,677	49,230	77,969	1,309,374	70,127	638,323	.....	11,906	.....	179,748	2,836,078	1,628,228
8	440,398	641,112	8,200	2,700	21,035	7,565	575,473	100	2,625	100	23,314	746,299	163,261
9	108,411	96,734	3,000	.....	28,105	716	59,073	1,540	1,221	.....	3,079	130,103	70,314
10	265,756	189,607	15,540	2,160	25,218	5,826	39,833	.....	22,900	.....	73,070	227,496	181,837
11	1,074,886	622,994	35,700	14,605	314,009	1,357	196,148	169	6,039	9,175	45,792	751,249	553,744
12	437,204	345,712	34,240	19,471	140,984	9,148	80,924	12,597	2,548	1,528	44,272	489,544	399,472
13	20,625	46,863	.....	.....	14,925	272	24,109	1,765	3,170	.....	2,622	60,594	36,213
14	1,416,871	796,477	19,940	12,443	134,827	67,160	446,609	10,870	3,571	8,760	92,307	876,245	362,476

* All other industries embrace—Continued.

Lime.....	2	Mineral and soda waters.....	14	Wall plaster.....	2
Marble and stone work.....	2	Slaughtering and meat packing.....	1		

AND TOTALS FOR ALL INDUSTRIES IN CITIES OF 10,000 BUT LESS THAN 50,000 INHABITANTS: 1909.

CITIES OF 10,000 TO 50,000 INHABITANTS—ALL INDUSTRIES COMBINED.

Capital.	EXPENSES.											Value of products.	Value added by manufacture.
	Total.	Services.			Materials.		Miscellaneous.						
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.			
1	\$1,670,201	\$1,409,338	\$48,270	\$62,959	\$617,781	\$47,374	\$559,700	\$4,340	\$10,662	.....	\$148,252	\$1,577,023	\$969,949

ALASKA.

INDUSTRIES IN GENERAL.

General character of the territory.—The territory of Alaska has a gross area of 590,884 square miles, and its population in 1910 was 64,356, as compared with 63,592 in 1900. The density of population was the same in 1910 as in 1900, one person to every 10 square miles. There were but two towns in the territory in 1910 having over 2,500 inhabitants—Fairbanks with 3,541 and Nome with 2,600—and only five others with a population exceeding 1,000. Only 26.8 per cent of the inhabitants of the territory resided in these seven towns and the seven smaller incorporated places. The absence of transportation facilities is one of the great drawbacks to the development of the vast resources of Alaska. The territory had only about 300 miles of railroad in 1909, which consisted chiefly of short lines

to meet local requirements. Several rivers are navigable, but these are open only a few months of the year. Alaska has great natural wealth; it is rich in minerals, in timber, and in fisheries, and has some agricultural possibilities.

Importance and growth of manufactures.—Although the manufactures of Alaska are relatively unimportant, they have shown considerable development since the first industrial census of the territory in 1890, when the only establishments reported were those engaged in the lumber industry.

The following table gives the most important figures relative to all classes of manufactures combined for 1909, 1904, and 1899, together with the percentages of increase from census to census:

	NUMBER OR AMOUNT.			PER CENT OF INCREASE. ¹	
	1909	1904	1899	1904-1909	1899-1904
Number of establishments.....	152	82	48	85.4	70.8
Persons engaged in manufactures.....	3,479	2,164	(²)	60.8	-----
Proprietors and firm members.....	135	31	(²)	335.5	-----
Salaried employees.....	245	195	82	25.6	137.8
Wage earners (average number).....	3,099	1,938	2,260	59.9	-14.2
Primary horsepower.....	3,975	2,946	1,071	34.9	175.1
Capital.....	\$13,060,000	\$10,085,000	\$3,569,000	22.2	199.4
Expenses.....	9,453,000	7,012,000	3,414,000	34.8	105.4
Services.....	2,328,000	1,418,000	1,493,000	64.2	-5.0
Salaries.....	380,000	322,000	118,000	18.0	172.9
Wages.....	1,948,000	1,096,000	1,375,000	77.7	-20.3
Materials.....	5,120,000	3,742,000	1,763,000	36.8	112.3
Miscellaneous.....	2,005,000	1,852,000	158,000	8.3	17.2
Value of products.....	11,340,000	8,245,000	4,194,000	37.5	96.6
Value added by manufacture (value of products less cost of materials).....	6,220,000	4,503,000	2,431,000	38.1	85.2

¹ A minus sign (-) denotes decrease.

² Figures not available.

In 1909 the territory of Alaska had 152 manufacturing establishments, which gave employment to an average of 3,479 persons during the year and paid out \$2,328,000 in salaries and wages. Of the persons employed, 3,099 were wage earners. These establishments turned out products to the value of \$11,340,000, in the manufacture of which materials costing \$5,120,000 were utilized. The value added by manufacture was thus \$6,220,000, which figure best represents the net wealth created by manufacturing operations during the year.

From 1904 to 1909 the number of establishments increased 85.4 per cent and the average number of

wage earners 59.9 per cent, while the value of products increased 37.5 per cent and the value added by manufacture 38.1 per cent. It would be improper to infer that manufactures increased in volume to the full extent indicated by these figures relating to values, since the increase shown is certainly due, in part, to the increase that has taken place in the prices of commodities.

The relative importance and growth of the leading manufacturing industries of the territory are shown in the comparative table on the next page.

An evidence of the advance made in manufactures in Alaska is the fact that the 82 establishments reported

in 1904 represented only 11 different industries, whereas the 152 establishments in 1909 represented 24 industries.

The figures for canning and preserving represent only the operations of fish canneries and fish-salting establishments. Alaska leads all of the states and territories of the Union in the production of canned and preserved fish, contributing 26.5 per cent of the total value of the output of this branch of the canning industry for the country as a whole in 1909, as compared with 29.3 per cent in 1904 and 17.4 per cent in 1899. In 1909, 46 establishments, with products valued at \$9,190,000, were reported for this industry, while in 1899 there were 36 establishments, with products valued at \$3,821,000. The average number of wage earners, which was only about one-half of the maximum number employed during the busy season, was 2,717 in 1909, as compared with 2,092 in 1899.

The lumber industry and printing and publishing are the only other industries for which comparative data for earlier censuses can be given. Twenty-two establishments were reported for the lumber industry

in 1909, as compared with 6 in 1904 and 10 in 1899, and the value of products for this industry was \$400,000 in 1909, \$245,000 in 1904, and \$155,000 in 1899. Nearly all the lumber cut was spruce, only a few thousand feet each of cottonwood, cedar, and hemlock being cut. The principal products of the mills, next to rough lumber, were salmon boxes, shingles, and building materials.

The printing and publishing industry has shown rapid growth since 1904, the first census year for which it was reported. In that year there were 5 establishments, and in 1909 there were 16. The value of products increased from \$26,000 in 1904 to \$228,000 in 1909. The number of daily papers increased from 3, with a circulation of 1,070, in 1904, to 12, with a circulation of 5,800, in 1909. No Sunday papers were published in 1904; but two of this class were published in 1909. The weeklies increased in number and circulation nearly as much as the dailies. All the publications were printed in the English language, and the average price for the dailies, exclusive of Sunday editions, was \$24 per annum, and for the weeklies \$12 per annum.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
			Expressed in thousands.										
All industries.....	1909	152	3,479	135	245	3,099	3,975	\$13,060	\$380	\$1,948	\$5,120	\$11,340	\$6,220
	1904	82	2,164	31	195	1,938	2,946	10,685	322	1,096	3,742	8,245	4,503
	1899	48	.....	.....	82	2,260	1,071	3,569	118	1,375	1,763	4,194	2,431
Canning and preserving.....	1909	46	2,922	21	184	2,717	1,855	10,822	247	1,458	4,053	9,190	5,137
	1904	63	1,993	13	175	1,805	2,305	10,276	292	950	3,546	7,736	4,190
	1899	36	2,163	7	64	2,092	.....	3,203	106	1,243	1,585	3,821	2,233
Lumber and timber products.....	1909	22	178	28	19	131	1,301	658	36	108	169	400	231
	1904	6	72	5	4	63	335	205	8	72	78	245	167
	1899	10	.....	.....	13	78	.....	150	8	56	67	155	88
Printing and publishing.....	1909	16	89	14	11	64	76	141	28	100	36	228	192
	1904	5	18	6	1	11	12	13	1	9	4	26	22
All other industries.....	1909	68	290	72	31	187	653	1,439	69	282	862	1,522	660
	1904	8	81	7	15	69	204	191	21	65	114	238	124
	1899	2	.....	.....	5	90	.....	216	4	76	103	218	110

Persons engaged in manufacturing industries.—Table I, page 1378, shows that the average number of persons engaged in manufactures during 1909 was 3,479, of whom 3,099 were wage earners. Of the remainder, 278 were proprietors and officials and 102 were clerks. Corresponding figures for individual industries also will be found in this table. Of the total number of persons engaged in all manufacturing industries, 8 per cent were proprietors and officials, 2.9 per cent clerks, and 89.1 per cent wage earners.

The industries of the territory are dependent upon male wage earners 16 years of age and over. In 1909 but 59 females over the age of 16 and 36 children under that age were reported, who formed 1.9 per cent and

1.2 per cent, respectively, of the average number of wage earners employed in all industries combined.

Wage earners employed, by months.—The next table gives the number of wage earners employed on the 15th of each month during the year 1909, for all industries combined, for canning and preserving, and for all other industries combined; it also gives the percentage which the number reported for each month is of the greatest number reported for any month.

In Table I, page 1378, are shown, for all of the important industries in the territory, the largest number and the smallest number of wage earners reported for any month. The figures are for the 15th day, or the nearest representative day, of the month.

The canning and preserving industry, which is a seasonal one, giving employment to a large number of persons from April to September, inclusive, affects greatly the total for all industries combined, by increasing the degree of variation between the numbers employed in different months. From 30 wage earners in this industry in January the number increased to 5,569 in July, the month of greatest employment. In the industries other than canning and preserving, considered together, the number is also largest in July, declining to a minimum in January, but the numbers reported for the months of least activity, January and February, form somewhat more than one-third of the number in July, whereas in the case of canning and preserving the proportions are less than 1 per cent.

MONTH.	WAGE EARNERS.					
	All industries.		Canning and preserving.		All other industries.	
	Number.	Percent of maximum.	Number.	Percent of maximum.	Number.	Percent of maximum.
January.....	242	3.9	30	0.5	212	36.9
February.....	256	4.2	44	0.8	212	36.9
March.....	588	9.6	288	5.2	300	52.3
April.....	4,977	81.0	4,580	82.2	397	69.2
May.....	5,875	95.6	5,379	96.6	496	86.4
June.....	5,992	97.5	5,432	97.5	560	97.6
July.....	6,143	100.0	5,569	100.0	574	100.0
August.....	6,055	98.6	5,524	99.2	531	92.5
September.....	5,117	83.3	4,060	83.7	457	79.6
October.....	1,229	20.0	861	15.5	368	64.1
November.....	488	7.1	187	3.4	251	43.7
December.....	281	4.6	50	0.9	231	40.2

Character of ownership.—The next table has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises. Comparative figures are given covering the censuses of 1909 and 1904. Comparative data for 1899 are not available.

The most important distinction shown is that between corporate and all other forms of ownership. In 1909 there were 58 establishments under corporate ownership, 1 less than in 1904. On account of the decided increase in the number of establishments operated by firms and individuals, the number owned by corporations constituted only 38.2 per cent of the total in 1909, as compared with 72 per cent in 1904. The value of products of the latter class of establishments far exceeded the combined value for all others in both years, and increased from \$8,011,114 in 1904 to \$9,603,065 in 1909, yet the proportion which it formed of the total for all establishments decreased from 97.2 per cent in 1904 to 84.7 per cent in 1909. The fact that over 90 per cent of the value of the output of the salmon canneries was reported for establishments controlled by corporations accounts for the predominance of this class of establishments in the statistics for all industries combined.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	152	3,099	\$11,340,105	\$6,220,492
1904.....	82	1,938	8,244,524	4,502,578
Individual:				
1909.....	65	303	879,038	544,628
1904.....	15	49	150,184	92,380
Firm:				
1909.....	29	121	858,002	361,235
1904.....	8	38	83,220	55,399
Corporation:				
1909 ¹	58	2,675	9,603,065	5,314,629
1904.....	59	1,851	8,011,114	4,354,799
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	42.8	9.8	7.8	8.8
1904.....	18.3	2.5	1.8	2.1
Firm:				
1909.....	19.1	3.9	7.6	5.8
1904.....	9.8	2.0	1.0	1.2
Corporation:				
1909 ¹	38.2	86.3	84.7	85.4
1904.....	72.0	95.5	97.2	96.7

¹ Includes one establishment under a form of ownership other than those named.

Size of establishment.—The next table groups the establishments according to the value of their products in 1909 and 1904. The table also shows the average size of establishments.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	152	3,099	\$11,340,105	\$6,220,492
1904.....	82	1,938	8,244,524	4,502,578
Less than \$5,000:				
1909.....	50	56	139,141	86,025
1904.....	15	13	30,915	17,889
\$5,000 and less than \$20,000:				
1909.....	41	127	441,851	277,259
1904.....	15	100	188,922	108,743
\$20,000 and less than \$100,000:				
1909.....	34	507	1,632,783	917,042
1904.....	17	460	969,208	458,200
\$100,000 and less than \$1,000,000: ¹				
1909.....	27	2,409	9,126,330	4,940,166
1904.....	35	1,365	7,055,479	3,917,746
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1904.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	32.9	1.8	1.2	1.4
1904.....	18.3	0.7	0.4	0.4
\$5,000 and less than \$20,000:				
1909.....	27.0	4.1	3.9	4.5
1904.....	18.3	5.2	2.3	2.4
\$20,000 and less than \$100,000:				
1909.....	22.4	16.4	14.4	14.7
1904.....	20.7	23.7	11.8	10.2
\$100,000 and less than \$1,000,000: ¹				
1909.....	17.8	77.7	80.5	79.4
1904.....	42.7	70.4	85.6	87.0
Average per establishment:				
1909.....		20	\$74,606	\$40,924
1904.....		24	100,543	54,909

¹ Includes one establishment with products valued at more than \$1,000,000.

In 1909, of the 152 manufacturing establishments in the territory, 27, or 17.8 per cent, had a value of products exceeding \$100,000, of which only 1 reported products exceeding \$1,000,000 in value. These establishments, however, notwithstanding their small number, employed an average of 2,409 wage earners, or 77.7 per cent of the total number in all establishments,

and reported 80.5 per cent of the total value of products and 79.4 per cent of the total value added by manufacture.

On the other hand, the small establishments—that is, those having a value of products of less than \$5,000—constituted a considerable proportion (32.9 per cent) of the total number of establishments, but the value of their products amounted to only 1.2 per cent of the total. The great bulk of the manufacturing was done in establishments having products valued at not less than \$100,000.

The average value of products per establishment decreased from \$100,543 in 1904 to \$74,606 in 1909, owing to the large increase in the number of small es-

tablishments. The average number of wage earners per establishment decreased from 24 in 1904 to 20 in 1909.

Engines and power.—The primary power employed in manufacturing industries increased from 1,071 horsepower in 1899 to 2,946 in 1904 and to 3,975 in 1909. The increase during the later five-year period was mostly in power generated by gas engines, the horsepower of which increased from 91 in 1904 to 628 in 1909. The amount of horsepower generated by steam in 1909 was practically the same as that in 1904, but much greater than that in 1899. The practice of renting power is on the increase, 4.2 per cent of the total power being rented in 1909, as against one-tenth of 1 per cent in 1904 and none in 1899.

TABLE I.—DETAIL STATEMENT FOR THE TERRITORY, BY INDUSTRIES: 1909.

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.								WAGE EARNERS—NUMBER FOR THE REPRESENTATIVE DAY.					Primary horsepower.	Capital.
		Total.	Proprietors and firm members.	Salaried officers, supts. and managers.	Clerks.		Average number.	Wage earners.		Total.	16 and over.		Under 16.			
					Male.	Female.		Maximum month.	Minimum month.		Male.	Female.				
													Male.	Female.		
1 All industries.....	152	3,479	135	143	96	6	3,099	Jy 6,143	Ja 242	(1)	(1)	(1)	(1)	(1)	3,975	\$13,060,116
2 Bread and other bakery products...	8	35	9	2			24	Jy ² 35	Ja ² 18	20	11	8	1		5	60,550
3 Canning and preserving.....	46	2,922	21	88	90	6	2,717	Jy 5,509	Ja 30	5,603	5,448	82	73		1,855	10,821,830
4 Copper, tin, and sheet-iron products...	7	20	8				12	Oc 18	Ja ² 9	14	14					39,006
5 Foundry and machine-shop products...	10	48	12	4			32	Jy ² 42	Ja ² 25	30	30				88	195,556
6 Jewelry.....	3	5	3				2	Au ² 3	Ja ² 2	3	2	1				65,300
7 Liquors, malt.....	5	24	6	0	1		11	De ² 16	Ja ² 8	16	16				98	213,420
8 Lumber and timber products.....	22	178	28	17	2		131	Jy 264	Ja 15	239	239				1,391	658,468
9 Printing and publishing.....	16	89	14	11			64	Je ² 70	Ja 56	62	56	6			70	140,609
10 Shipbuilding, including boatbuilding...	6	16	8				8	Ap ² 17	Au ² 4	12	12				5	11,150
11 All other industries ²	29	142	26	15	3		98								457	854,237

INDUSTRY.	Total.	EXPENSES.									Value of products.	Value added by manufacture.
		Services.			Materials.		Miscellaneous.					
		Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.	Other.		
1 All industries.....	\$9,453,126	\$314,953	\$64,801	\$1,948,026	\$225,016	\$4,804,597	\$22,415	\$115,319	\$99,350	\$1,768,649	\$11,340,105	\$6,220,492
2 Bread and other bakery products...	124,956	4,185		41,900	4,858	66,241	2,880	125		4,707	141,110	70,011
3 Canning and preserving.....	7,585,514	187,239	59,601	1,457,587	147,510	3,905,584	5,420	103,046	89,653	1,629,874	9,189,982	5,136,888
4 Copper, tin, and sheet-iron products...	65,103			27,860	2,680	28,110	1,740	75		4,688	81,258	50,468
5 Foundry and machine-shop products...	127,649	9,696		50,505	10,811	49,725	920	30		5,962	170,798	110,262
6 Jewelry.....	24,088			2,703	780	17,450	600	50	1,000	1,505	33,535	15,305
7 Liquors, malt.....	138,887	17,600	1,000	23,257	7,180	43,510		8,967	3,100	34,273	176,052	125,362
8 Lumber and timber products.....	336,238	33,683	2,400	108,201	3,285	165,219	1,885	986	1,757	18,872	400,272	231,768
9 Printing and publishing.....	184,095	28,400		100,403	8,723	27,669	4,480		800	13,670	228,192	191,800
10 Shipbuilding, including boatbuilding...	5,579			2,440	360	2,779					10,330	7,191
11 All other industries ²	861,017	34,150	1,800	133,170	38,829	588,310	4,540	2,090	3,040	55,088	908,576	281,437

¹ No figures given for reasons explained in the Introduction.

² Same number reported for one or more other months.

³ All other industries embrace—

Artificial stone.....	2	Cooperage and wooden goods, not elsewhere specified.....	1
Belting and hose, woven and rubber.....	2	Fur goods.....	1
Carrriages and wagons and materials.....	2	Furniture and refrigerators.....	1
Cars and general shop construction and repairs by steam-railroad companies.....	2	Leather goods.....	2
Confectionery.....	1	Mattresses and spring beds.....	2

Mineral and soda waters.....	6
Oil, not elsewhere specified.....	2
Pumps, not including steam pumps.....	1
Slaughtering and meat packing.....	2
Tobacco manufactures.....	2

HAWAII.

INDUSTRIES IN GENERAL.

General character of the territory.—The territory of Hawaii consists of eight inhabited islands, with a combined area of 6,449 square miles, besides a number of small uninhabited islands. Its population in 1910 was 191,909, as compared with 154,001 in 1900.

Honolulu (coextensive with Honolulu district), with a population of 52,183 in 1910, is the only large city. The remainder of the population is mostly rural. The density of population for the entire territory is 30 per square mile, and if Honolulu is excluded, only 22 per square mile.

Hawaii has no important mineral resources, but its climate and soil are well adapted for agriculture, and its industrial progress is dependent entirely upon its agricultural products. Those manufacturing indus-

tries which have not been called into being by the agricultural products of the islands exist for the production or repair of articles of local consumption.

Importance and growth of manufactures.—Hawaii was annexed to the United States in 1898 and organized as a territory in 1900, and was therefore included in the census of 1900, which was the first enumeration of its manufactures. The industrial census of 1904 was confined to continental United States, consequently no canvass was made in Hawaii.¹

The following table gives the more important figures relative to all classes of manufactures combined for the territory as returned at the censuses of 1909 and 1899, together with percentages of increase for the 10 years:

	NUMBER OR AMOUNT.		PER CENT OF INCREASE.
	1909	1899	1899-1909
Number of establishments.....	500	222	125.2
Persons engaged in manufactures.....	7,572	4,418	71.4
Proprietors and firm members.....	1,074	244	340.2
Salaried employees.....	594	519	14.4
Wage earners (average number).....	5,904	3,655	61.5
Primary horsepower.....	41,930	19,590	114.0
Capital.....	\$23,875,000	\$10,746,000	122.2
Expenses.....	31,753,000	15,061,000	110.8
Services.....	2,795,000	2,038,000	37.1
Salaries.....	686,000	565,000	21.4
Wages.....	2,109,000	1,473,000	43.2
Materials.....	25,629,000	12,251,000	109.2
Miscellaneous.....	3,329,000	772,000	331.2
Value of products.....	47,404,000	23,354,000	103.0
Value added by manufacture (value of products less cost of materials).....	21,775,000	11,103,000	96.1

¹ Includes 272 members of cooperative associations not reported in 1899.

In 1909 the territory of Hawaii had 500 manufacturing establishments, which gave employment to an average of 7,572 persons during the year and paid out \$2,795,000 in salaries and wages. Of the persons employed, 5,904 were wage earners. These establishments turned out products to the value of \$47,404,000, to produce which materials costing \$25,629,000 were consumed. The value added by manufacture was thus \$21,775,000, which figure best represents the net wealth created by manufacturing operations during the year.

In general, this table brings out the fact that the manufacturing industries of Hawaii as a whole showed marked development during the decade, due at least in part to the impetus given manufacturing industries by the annexation of the territory to the United States. During this period the number of establishments increased 125.2 per cent and the average number of wage earners 61.5 per cent, while the value of products

increased 103 per cent and the value added by manufacture 96.1 per cent. As pointed out in the Introduction, it would be improper to infer that manufactures increased in volume during the period 1899-1909 to the extent indicated by these figures regarding values, since the increase shown is certainly due, in part, to the increase that has taken place in the prices of commodities.

It is a matter of interest to note that the percentages of increase shown for number of wage earners and for wages were much less than those for the number of establishments, value of products, and value added by manufacture.

The relative importance and growth of the leading manufacturing industries of the territory are shown in the next table.

¹ In 1905, however, an interesting study of the labor conditions and general industrial progress in the territory was made under the direction of the Commissioner of Labor. See Bulletin of the Bureau of Labor, No. 66, published in 1906.

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.		PER CENT OF INCREASE ¹ (1899-1909).	
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.	Value of products.	Value added by manufacture.
All industries	500	5,904	100.0	\$47,404,000	100.0	\$21,775,000	100.0	103.0	96.1
Sugar	46	2,517	42.6	35,950,000	75.8	17,408,000	79.9	86.7	83.7
Rice, cleaning and polishing	74	138	2.3	2,239,000	4.7	688,000	2.9	237.2	250.5
Canning and preserving, pineapples	10	810	20.4	1,591,000	3.4	664,000	3.0	(?)	(?)
Slaughtering and meat packing, wholesale	10	37	0.6	864,000	1.8	122,000	0.6	(?)	(?)
Printing and publishing	37	319	5.4	435,000	0.9	337,000	1.5	117.5	101.8
Food preparations	87	172	2.9	341,000	0.7	146,000	0.7	450.0	294.6
Bread and other bakery products	46	107	1.8	344,000	0.7	124,000	0.6	3,340.0	2,380.0
Copper, tin, and sheet-iron products	12	80	0.2	304,000	0.6	133,000	0.6	234.1	150.9
Coffee, cleaning and polishing	5	71	1.2	297,000	0.6	46,000	0.2	212.6	81.4
Lumber and timber products	8	254	4.3	281,000	0.6	184,000	0.8	208.8	275.5
All other industries	3 165	1,303	18.2	4,758,000	10.1	1,973,000	9.3	64.9	79.7

¹ Per cent of increase is based on figures in Table I.

² New industry since 1899.

³ Includes two important industries—foundry and machine shops, with three establishments, and fertilizers, with two establishments—for which separate figures can not be given without disclosing individual operations.

The most important industries listed in this table, where they are arranged in the order of the value of products, call for brief consideration.

Sugar.—The prosperity of Hawaii depends largely upon its sugar products. The cultivation of sugar cane in commercial quantities and the manufacture of sugar were begun about 75 years ago, and since 1875 this industry has increased rapidly and steadily. Cane sugar alone is produced, although recent experiments in growing sugar beets indicate the possibility that this industry may secure a foothold in the territory.

In 1909 the value of the sugar manufactured amounted to 75.8 per cent of the value of all manufactures of the territory. Since the sugar industry so greatly preponderates among the manufacturing industries of the islands, it exerts a powerful effect on the increase shown for all manufacturing industries combined. Exclusive of sugar, the value of the manufactures increased from \$4,099,000 in 1899 to \$11,454,000 in 1909, or 179.4 per cent.

The United States has imported nearly all of the Hawaiian sugar, a large part of which is refined after importation. The exports of sugar during the year ending June 30, 1909, were valued at \$37,632,821 and represented 93.1 per cent of the value of all exports to the United States. The exports of domestic merchandise to the United States, exclusive of sugar, were valued at \$2,762,219, and of these canned fruit amounted to \$1,229,647 and rice to \$255,312, leaving a balance of \$1,277,260 to represent the value of all other exports.

Rice, cleaning and polishing.—With the exception of some of the larger mills in and near Honolulu, this industry is carried on by the Chinese and Japanese. Practically all of the rice milled in the islands is consumed locally, being in great demand among the Chinese and Japanese, who constitute about one-half of the population. During the year ending June 30, 1909, the imports of rice products amounted to 28,197,453 pounds, valued at \$728,791, while the exports amounted

to only 5,869,759 pounds, valued at \$257,247. About 99 per cent of the imported rice came from Japan.

Canning and preserving, pineapples.—Since 1895, when this industry was first known commercially in the islands, it has shown a steady growth. It was not of enough importance, however, at the census of 1899 to be shown separately, and was included probably with food preparations. Considering the short season during which it is carried on the value of products is significant compared with the values reported for other industries. Measured by value added by manufacture this industry is second in importance, although holding third place in actual value of products.

This table shows also the percentages of increase for these leading industries in respect to value of products and value added by manufacture. The rice cleaning and polishing industry showed an increase of 237.2 per cent in value of products, while sugar showed an increase of 86.7 per cent. The canning and preserving industry is shown as a new industry.

The increase in manufacturing in Hawaii since 1899 is shown in greater detail in Table I. In practically every industry an increase is indicated in number of establishments and in value of products.

In 1909, 87 establishments were engaged in the manufacture of food preparations, 74 of these making poi, a native food obtained by baking and pounding to a thin paste the kalo or taro root, which is allowed to ferment. The articles included under "Food preparations," the number of establishments preparing them, and the value of the output of the several kinds, are shown in the following tabular statement:

PRODUCT	Number of establishments.	Value of products.
Total	87	\$341,052
Poi	74	271,720
Soy and fish paste	5	9,137
Bean-curd	4	4,665
Macaroni	4	55,530

It is significant that the boot and shoe shops reported for Hawaii have an average value of products of only about \$9,000. They include a number of small establishments engaged largely in custom work, which in continental United States would be excluded from the census. They are, however, included for Hawaii, because they represent such an important part of the boot and shoe industry in the territory.

Three establishments which have commenced operations since 1899 were engaged in the manufacture of malt liquors, two in the distillation of liquors, and one in the manufacture of wine. For 1909 the total products of these six establishments amounted to more than \$300,000. Of the three establishments engaged in the manufacture of malt liquors, only one, located in Honolulu, is engaged in the manufacture of beer from malt and hops, the other two producing a Japanese drink made from rice, known as saki. One of the distilleries made a rum from molasses, and the other was engaged in the manufacture of brandy and wine from pineapples, bananas, and grapes.

A petroleum gas plant, which went into operation in Honolulu in 1905, is the only gas plant in Hawaii. Early in 1907 a company was organized to manufacture lime. Four small establishments have begun recently to extract salt from brine.

Persons engaged in manufacturing industries.—The following table shows the distribution of the average number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age in the manner already explained. (See Introduction.)

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	7,572	7,046	526
Proprietors and officials.....	1,338	1,327	11
Proprietors and firm members.....	1,074	1,063	11
Salaried officers of corporations.....	24	24	
Superintendents and managers.....	240	240	
Clerks.....	330	317	13
Wage earners (average number).....	5,904	5,401	503
16 years of age and over.....	5,842	5,344	498
Under 16 years of age.....	62	57	5

This table shows that there were 7,572 persons returned as the average number engaged in manufactures during 1909, of whom 5,904 were wage earners, 1,338 proprietors and officials, and 330 clerks. Of the total number, 93.1 per cent were males and 6.9 per cent females. Almost all the females were wage earners, only 11 female proprietors and firm members and 13 female clerks being reported. Corresponding figures for individual industries will be found in Table II.

Of the total number of persons engaged in manufactures, 4,080, or 53.9 per cent, were in three industries,

as follows: Canning and preserving, pineapples, 853; rice, cleaning and polishing, 518; and sugar, 2,709. The sugar industry far outranks all other industries in respect to the average number of persons engaged, but owing to its seasonal character employed a less number of wage earners during the months of least activity—September, October, and November—than did the canning and preserving industry during the months of greatest activity in this industry—July, August, and September.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, in the number of the persons employed in manufactures. It covers all industries combined and three important industries.

INDUSTRY.	PER CENT OF PERSONS ENGAGED IN MANUFACTURES.			
	Total.	Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	100.0	17.7	4.4	78.0
Canning and preserving, pineapples.....	100.0	2.1	2.2	95.7
Rice, cleaning and polishing.....	100.0	68.7	3.7	25.6
Sugar.....	100.0	3.4	3.7	92.9
All other industries.....	100.0	24.8	5.5	69.7

Of the persons engaged in manufactures, 17.7 per cent were officials, 4.4 per cent clerks, and 78 per cent wage earners. In the cleaning and polishing of rice the majority of the establishments is small and the work is done to a large extent by the proprietors or their immediate representatives. Therefore the proportion of persons engaged in the industry falling in the class of proprietors and officials is very much higher than for other industries or all industries combined.

The following table shows, for 1909, in percentages, for all industries combined and for some of the important industries separately, the distribution of clerks by sex and wage earners by age periods and sex:

INDUSTRY.	CLERKS.		WAGE EARNERS.			
	Per cent.		Per cent 16 years of age and over.		Per cent under 16 years of age.	
	Male.	Female.	Male.	Female.	Male.	Female.
All industries.....	96.1	3.9	90.5	8.4	1.0	0.1
Canning and preserving, pineapples.....	89.5	10.5	69.1	30.0	0.7	0.1
Rice, cleaning and polishing.....	100.0		100.0			
Sugar.....	100.0		96.5	3.4	0.1	
All other industries.....	94.3	5.7	91.0	6.0	2.0	0.2

Of the clerks, 96.1 per cent were male and 3.9 per cent female. Of the wage earners, 91.5 per cent were male and 8.5 per cent female; 98.9 per cent were 16 years of age and over and but 1.1 per cent were under 16 years.

It may be noted that the largest number of women and children were employed in canning and preserv-

ing. The average number of wage earners in that industry was 564 males and 245 females 16 years of age and over and 6 males and 1 female under that age. Of the total of 503 females in all industries combined, 246 were in this industry and 86 in the sugar industry. Thus 66 per cent of the total female employees were reported by these two industries.

In order to compare the distribution of persons engaged in manufactures in 1909 with that shown in the census of 1899 it is necessary to use the classification employed at the earlier census. (See Introduction.) The following table makes this comparison according to occupational status:

CLASS.	PERSONS ENGAGED IN MANUFACTURES.				
	1909		1899		Per cent of increase, 1899-1909.
	Number.	Per cent distribution.	Number.	Per cent distribution.	
Total.....	7,572	100.0	4,418	100.0	71.4
Proprietors and firm members.....	1,074	14.2	244	5.5	340.2
Salaried employees.....	504	7.8	519	11.7	14.4
Wage earners (average number).....	5,904	78.0	3,655	82.7	61.5

There were 4,418 persons engaged in manufactures in 1899, as compared with 7,572 in 1909, an apparent increase of 3,154, or 71.4 per cent. The actual increase was only 2,882, or 65.2 per cent, as 272 members of cooperative societies were reported as partners in 1909, this industrial class not being included in the census of 1899. The formation of general partnerships with from 5 to 40 partners in each, accounts for the large increase in the number of proprietors and firm members, only a very few such partnerships being reported in 1899, and these with less than 10 partners in each case. Both the cooperative associations and these large general partnerships are composed of Japanese or of Chinese, one of the cooperative establishments having 200 Japanese members and another general partnership being composed of 40 Chinese.

The following table shows the average number of wage earners, distributed according to age periods, and in case of those 16 years of age and over according to sex, for 1909 and 1899:

CLASS.	AVERAGE NUMBER OF WAGE EARNERS.			
	1909		1899	
	Number.	Per cent distribution.	Number.	Per cent distribution.
Total.....	5,904	100.0	3,655	100.0
16 years of age and over.....	5,842	98.9	3,630	99.3
Male.....	5,344	90.5	3,486	95.6
Female.....	498	8.4	134	3.7
Under 16 years of age.....	62	1.0	25	0.7

This table indicates that for all industries combined there was an increase of 364, or 271.6 per cent, in the number of adult female wage earners, the number having increased from 134 in 1899 to 498 in 1909, and an increase of 37, or 148 per cent, in the number of children employed. In 1909, 8.4 per cent of the total number of wage earners 16 years of age and over were women, while in 1899 only 3.7 per cent were women.

Wage earners employed, by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for canning and preserving pineapples, for sugar, and for all other industries; it also gives the percentage which the number each month is of the greatest number employed in any one month.

MONTH.	WAGE EARNERS.							
	All industries.		Canning and preserving, pineapples.		Sugar.		All other industries.	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	5,927	81.3	364	18.7	3,217	91.7	2,346	86.8
February.....	6,050	83.5	305	15.7	3,470	99.2	2,302	85.2
March.....	6,041	82.8	427	22.0	3,280	93.5	2,334	83.3
April.....	6,500	89.3	464	23.9	3,508	100.0	2,537	93.8
May.....	6,457	88.5	488	25.1	3,328	94.9	2,641	97.7
June.....	6,608	90.6	810	41.7	3,134	89.3	2,664	98.6
July.....	7,202	100.0	1,686	86.8	2,948	84.0	2,658	98.3
August.....	6,324	86.7	1,943	100.0	1,764	50.3	2,617	96.8
September.....	5,720	78.5	1,587	81.7	1,448	41.3	2,691	99.6
October.....	4,345	59.6	721	37.1	970	27.6	2,654	98.2
November.....	4,214	57.8	526	27.1	964	28.3	2,694	99.7
December.....	5,326	73.0	477	24.5	2,146	61.2	2,703	100.0

The two industries, canning and preserving, pineapples, and sugar, which are seasonal industries, the former giving employment to an unusually large number of persons during July, August, and September, and the latter during the months from January to July, inclusive, affect greatly the total for all industries combined. They thus not only make the month of July the month of greatest employment, but also magnify the irregularity of employment throughout the year. The variation by months in employment in these two industries depends on the seasons in which the raw materials mature. Outside these two industries the number of wage earners employed underwent but little change from month to month, the numbers showing a general increase from February to the end of the year.

Prevailing hours of labor.—Establishments have been classified also according to the prevailing number of hours of labor of the bulk of their employees; that is to say, the wage earners of each establishment are all classified according to the prevailing hours of labor in the establishment, even though some may have to work a different number of hours. The table that follows shows the result of this classification. It is based on the average number of wage

earnings employed during the year. In the cases of canning and preserving, pineapples, and of sugar this average is far less than the number employed in the busy season.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	5,904	190	839	825	580	865	892	1,394	319
Bread and other bakery products.....	107	14	1	17	.....	7	34	9	25
Canning and preserving, pineapples.....	816	.....	.....	310	235	271	.....	.....	.....
Coffee, cleaning and polishing.....	71	3	.....	4	.....	64	.....	.....	.....
Copper, tin, and sheet-iron products.....	80	11	.....	12	.....	65	2	.....	.....
Food preparations.....	172	61	3	8	.....	70	25	6	.....
Lumber and timber products.....	254	32	16	15	181	10	.....	.....	.....
Printing and publishing.....	319	36	156	84	7	36	.....	.....	.....
Rice, cleaning and polishing.....	138	.....	11	27	.....	61	22	16	.....
Slaughtering and meat packing.....	37	9	.....	18	3	4	3	.....	.....
Sugar.....	2,517	.....	.....	.....	.....	115	779	1,348	275
All other industries.....	1,393	24	632	330	153	172	27	16	19

It is evident from these figures that for nearly half the total number of wage earners employed in the manufacturing industries of Hawaii the prevailing hours of labor per week are over 60, or an average of over 10 hours per day. The figures for all industries combined are affected, however, to a large extent by the long hours reported in the sugar industry. In this industry all of the employees were engaged 60 or more hours per week, and about two-thirds were engaged 72 hours and over. Exclusive of those engaged in the sugar industry, almost two-thirds of the wage earners were employed from 54 to 60 hours, inclusive, per week, 5.6 per cent were employed 48 hours or less per week, and 6 per cent were employed more than 60 hours per week.

Location of establishments.—The next table shows the extent to which manufacturing in the territory is centralized in the one city, Honolulu. In 1909, 22.6 per cent of the total value of products was made in this city, and 41.2 per cent of the average number of wage earners were employed there. The figures indicate that since 1899 there has been a more rapid increase in Honolulu than in the districts outside. The relatively large number of establishments in Honolulu was due, however, to the fact that in this city were found many of the poi shops, bakeries, tin shops, and less important industries. While there was a large number of these concerns, they were all small establishments. Indeed, the combined value of products of 226 of the 236 establishments reported from Honolulu amounted to about \$4,980,000, while the value of products of the remaining 10 establishments, of which 3 were foundry and machine shops, 3 pineapple canneries, 3 fertilizer factories, and 1 a sugar mill, approximated \$5,700,000. The other sugar mills were located on the plantations or farms in the rural districts.

The statistics for the principal manufacturing industries in the territory and of the city of Honolulu are presented for 1909 and 1899 in Table I.

ITEM.	Year.	Total.	LOCATION OF ESTABLISHMENTS.		PER CENT OF TOTAL.	
			Honolulu.	Outside districts.	Honolulu.	Outside districts.
Population.....	1910	191,909	52,183	139,726	27.2	72.8
	1900	154,001	39,306	114,695	25.5	74.5
Number of establishments.	1909	500	236	264	47.2	52.8
	1899	222	53	169	23.9	76.1
Average number of wage earners.	1909	5,904	2,432	3,472	41.2	58.8
	1899	3,655	929	2,726	25.4	74.6
Value of products.....	1909	\$47,403,880	\$10,704,744	\$36,699,136	22.6	77.4
	1899	23,353,665	3,264,574	20,089,091	14.0	86.0
Value added by manufacture.	1909	21,774,571	4,335,520	17,439,051	19.9	80.1
	1899	11,102,704	1,293,339	9,809,365	11.6	88.4

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises in 1909 and 1899, respectively.

The most important distinction shown is that between corporate and all other forms of ownership. For all industries combined, 28 per cent of the total number of establishments had in 1909 a corporate form of organization, as against 72 per cent for all other forms. The corresponding figures for 1899 were 32.4 per cent and 67.6 per cent, respectively. For all industries combined, as measured by value of products and value added by manufacture, corporations show a slight increase in relative importance, as they operated establishments whose value of products formed 92.2 per cent of the total for all establishments in 1899 and 92.8 per cent in 1909, while the value added by manufacture formed 93.4 per cent of the total in 1899 and 94 per cent in 1909.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	500	5,904	\$47,403,880	\$21,774,571
1899.....	222	3,655	23,353,665	11,102,764
Individual:				
1909.....	240	520	1,590,352	723,750
1899.....	96	320	902,695	375,033
Firm:				
1909.....	92	414	1,712,267	543,334
1899.....	53	279	906,148	344,377
Corporation:				
1909.....	140	4,935	43,982,101	20,459,615
1899.....	72	3,048	21,526,749	10,375,513
Other:				
1909.....	28	26	113,160	42,872
1899.....	1	8	13,073	7,841
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1899.....	100.0	100.0	100.0	100.0
Individual:				
1909.....	48.0	9.0	3.4	3.3
1899.....	43.2	8.8	3.9	3.4
Firm:				
1909.....	18.4	7.0	3.6	2.5
1899.....	23.9	7.6	3.9	3.1
Corporation:				
1909.....	28.0	83.5	92.8	94.0
1899.....	32.4	83.4	92.2	93.4
Other:				
1909.....	5.6	0.4	0.2	0.2
1899.....	0.4	0.2	0.1	0.1
Rice, cleaning and polishing, 1909.....	74	138	\$2,238,667	\$637,919
Individual.....	38	58	536,900	242,268
Firm.....	30	53	595,039	128,145
Corporation.....	6	27	1,106,128	267,506
Per cent of total:				
Individual.....	51.4	42.0	24.0	38.0
Firm.....	40.5	38.4	26.6	20.1
Corporation.....	8.1	19.6	49.4	41.9
Sugar, 1909.....	46	2,517	\$35,949,822	\$17,407,747
Firm.....	3	52	480,218	180,863
Corporation.....	43	2,465	35,469,604	17,226,884
Per cent of total:				
Firm.....	6.5	2.1	1.3	1.0
Corporation.....	93.5	97.9	98.7	99.0

¹ Includes the group "Individual," to avoid disclosure of individual operations.

The establishments conducted by individuals and partners were confined to the smaller and less important industries. Considering the three most important manufacturing industries of the islands—all of the canning establishments and 43 of the 46 sugar mills were under corporate ownership, while only 6 of the 74 rice mills belonged to this class. These 6 rice mills, however, reported 49.4 per cent of the total value of rice products. The incorporated companies in the three specified industries reported products to the amount of \$38,166,805, or 86.8 per cent of the total value of products reported by all incorporated companies engaged in manufactures.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the following table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries and for important industries separately as measured by number of wage earners, value of products, and value added by manufacture. The totals for all industries are shown for the

last two censuses, while for certain important industries figures are given for 1909 only.

INDUSTRY AND VALUE OF PRODUCTS.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES:				
1909.....	500	5,904	\$47,403,880	\$21,774,571
1899.....	222	3,655	23,353,665	11,102,764
Less than \$5,000:				
1909.....	255	355	564,887	288,576
1899.....	97	122	185,928	113,238
\$5,000 and less than \$20,000:				
1909.....	109	540	1,085,306	495,977
1899.....	50	332	486,704	240,392
\$20,000 and less than \$100,000:				
1909.....	72	855	2,951,873	1,198,972
1899.....	31	443	1,336,409	638,587
\$100,000 and less than \$1,000,000:				
1909.....	52	2,818	20,733,541	8,562,543
1899.....	39	1,040	15,331,918	6,877,425
\$1,000,000 and over:				
1909.....	12	1,336	22,068,293	11,228,503
1899.....	5	818	6,012,706	3,232,622
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
1899.....	100.0	100.0	100.0	100.0
Less than \$5,000:				
1909.....	51.0	6.0	1.2	1.3
1899.....	43.7	3.3	0.8	1.0
\$5,000 and less than \$20,000:				
1909.....	21.8	9.1	2.3	2.3
1899.....	22.5	9.1	2.1	2.2
\$20,000 and less than \$100,000:				
1909.....	14.4	14.5	6.2	5.5
1899.....	14.0	12.1	5.7	5.8
\$100,000 and less than \$1,000,000:				
1909.....	10.4	47.7	43.7	39.3
1899.....	17.6	53.1	65.6	61.9
\$1,000,000 and over:				
1909.....	2.4	22.6	46.6	51.6
1899.....	2.2	22.4	25.7	29.1
Average per establishment:				
1909.....	12	12	\$94,808	\$43,549
1899.....	16	16	105,197	50,012
Canning and preserving, pine-apples, 1909.....	10	816	\$1,591,073	\$664,482
\$20,000 and less than \$100,000.....	6	127	279,859	124,037
\$100,000 and less than \$1,000,000.....	4	689	1,311,214	540,425
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	60.0	15.6	17.6	18.7
\$100,000 and less than \$1,000,000.....	40.0	84.4	82.4	81.3
Average per establishment:				
1909.....	82	82	\$159,107	\$66,448
Rice, cleaning and polishing, 1909.....	74	138	\$2,238,667	\$637,909
Less than \$5,000.....	34	22	74,529	27,769
\$5,000 and less than \$20,000.....	19	31	205,777	85,322
\$20,000 and less than \$100,000.....	15	54	617,962	198,880
\$100,000 and less than \$1,000,000.....	6	31	1,340,399	375,958
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
Less than \$5,000.....	46.9	15.9	3.3	4.4
\$5,000 and less than \$20,000.....	25.7	22.5	9.2	5.5
\$20,000 and less than \$100,000.....	20.3	39.1	27.6	31.2
\$100,000 and less than \$1,000,000.....	8.1	22.5	59.9	58.9
Average per establishment:				
1909.....	2	2	\$30,252	\$8,620
Sugar, 1909.....	46	2,517	\$35,949,822	\$17,407,747
\$20,000 and less than \$100,000.....	3	54	228,770	73,941
\$100,000 and less than \$1,000,000.....	32	1,179	14,670,438	6,234,800
\$1,000,000 and over.....	11	1,284	21,069,614	11,099,006
Per cent of total:				
1909.....	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	6.5	2.1	0.6	0.4
\$100,000 and less than \$1,000,000.....	69.6	46.8	40.8	35.8
\$1,000,000 and over.....	23.9	51.0	58.6	63.8
Average per establishment:				
1909.....	55	55	\$781,518	\$378,429

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

This table shows that, in 1909, of the 500 establishments, only 12, or 2.4 per cent, had a value of products exceeding \$1,000,000. These establishments, however, notwithstanding their small number, had a total average number of wage earners of 1,336, or 22.6 per cent of the total number in all establishments; and the importance of their operations, as measured by value of products, was 46.6 per cent of the total and by value added by manufacture 51.6 per cent of the total.

On the other hand, small establishments—that is, those having a value of products of less than \$5,000—constituted a very considerable proportion (51 per cent) of the total number of establishments, but the value of their products amounted to only 1.2 per cent of the total. The great bulk of the manufacturing was carried on in establishments having products valued at not less than \$100,000.

The fact that the average number of wage earners per establishment decreased from 16 to 12, the value of products from \$105,197 to \$94,808, and the value added by manufacture from \$50,012 to \$43,549, can scarcely be taken as an indication of a change in the tendency away from concentration. It may be due to a more thorough canvass of the small establishments at the census of 1909 or to an increase in the number of small establishments in the less important industries measured by value of products, such as bread and other bakery products and food preparations.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the average number of wage earners employed. The next table shows such a classification for all industries combined and for three important industries, and gives not only the number of establishments falling in each group but also the average number of wage earners employed.

This table shows classes in considerable detail. Consolidating these classes to a certain extent it will be seen that 67.2 per cent of the establishments employed under 21 persons each, and 18.6 per cent employed no wage earners. The most numerous single group consists of the 256 establishments employing under 6 wage earners, the next being the group employing from 6 to 20, with 80 establishments. There were 14 establishments that employed over 100 wage earners; 2 employed over 250.

Of the total number of wage earners, 38.3 per cent were in establishments employing over 100 wage earners. The single group having the largest number of employees was the group employing from 101 to 250 wage earners. This group employed 1,670 wage earners, or 28.3 per cent of the total. The next most numerous group was that employing from 21 to 50 wage earners, with 1,396 wage earners, or 23.6 per cent of the total.

The sugar and the canning and preserving industries listed in this table are industries in which comparatively large establishments do most of the business, as appears from the classification of the wage earners. On the other hand, 71.7 per cent of the wage earners engaged in the cleaning and polishing of rice were in establishments employing under 6 wage earners, and the remaining 23.3 per cent in this industry were in establishments employing from 6 to 20 wage earners.

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—						
		No wage earners.	Under 6 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.
NUMBER OF ESTABLISHMENTS.								
All industries.....	500	93	256	80	44	13	12	2
Canning and preserving pineapples.....	19		1	1	4		3	1
Rice, cleaning and polishing.....	74	13	56	5				
Sugar.....	46		6	26	6	8		
All other industries.....	370	80	196	68	14	7	1	1
PER CENT OF NUMBER OF ESTABLISHMENTS.								
All industries.....	100.0	18.6	51.2	16.0	8.8	2.6	2.4	0.4
Canning and preserving pineapples.....	100.0		10.0	10.0	40.0		30.0	10.0
Rice, cleaning and polishing.....	100.0	17.6	75.7	6.8				
Sugar.....	100.0		13.0	56.5	13.0	17.4		
All other industries.....	100.0	21.6	53.8	18.4	3.8	1.9	0.3	0.3
AVERAGE NUMBER OF WAGE EARNERS.								
All industries.....	5,904		571	825	1,396	852	1,670	590
Canning and preserving pineapples.....	816		4	20	103		379	310
Rice, cleaning and polishing.....	138		99	39				
Sugar.....	2,517		82	825	399	1,110		
All other industries.....	2,433		468	684	367	453	181	280
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.								
All industries.....	100.0		8.7	14.0	23.6	14.4	28.3	10.0
Canning and preserving pineapples.....	100.0		0.5	2.4	12.6		46.4	38.0
Rice, cleaning and polishing.....	100.0		71.7	28.3				
Sugar.....	100.0			3.3	36.8	15.9	44.1	
All other industries.....	100.0		19.2	28.1	15.1	18.6	7.4	11.5

Expenses.—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest, however, can be brought out concerning the relative importance of the different classes of expenses going to make up the total.

The following table shows, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	2.2	6.6	80.7	10.5
Canning and preserving, pineapples.....	3.5	13.1	69.6	13.8
Rice, cleaning and polishing.....	0.7	2.1	94.6	2.7
Sugar.....	1.2	3.5	84.1	11.1
All other industries.....	5.4	16.7	68.2	9.7

This table shows that, for all industries combined, 80.7 per cent of total expenses were incurred for materials. An unusual condition is found in Hawaii in the fact that the miscellaneous expenses form a larger proportion of the total expenses than do the salaries and wages combined. The large amount reported for miscellaneous expenses is due partly to the generally high taxes prevailing in Hawaii and also to the large amount reported in the sugar industry under the general head of "Rent of offices and buildings, rent of machinery, royalties, use of patents, insurance, ordinary repairs of buildings and machinery, advertising, traveling, and other sundry expenses." In addition to a general property tax of 1 per cent on the full value of real and personal property and a general income tax of 2 per cent on incomes of over \$1,500, a special income tax on the net profits or incomes above \$4,000 went into effect beginning with the year 1909.

Engines and power.—The next table shows, for all industries combined, the number of engines or other motors, according to their character, employed in generating power (including electric motors operated by purchased current), and their total horsepower at the censuses of 1909 and 1899. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

The table indicates that the increase in primary power was largely in power generated by steam. The more general use of gas engines is shown, the number of such engines being 87 in 1909, as against 10 in 1899, and the horsepower showing even a larger increase,

being 1,117 in 1909, as against 79 in 1899. There were 228 establishments reported as using power in 1909, as compared with 124 in 1899. In 1909 the average horsepower per establishment using horsepower was 183.9, as compared with 158 in 1899. Comparatively little water power was used, and this almost entirely in the rice and the sugar mills, which were located on the various plantations where mountain streams were available for water power. The figures also show that the practice of renting power is on the increase, the number of motors using rented power being 99 in 1909, as against 18 in 1899. The use of electric motors for the purpose of applying power generated within the establishment is shown to be increasing rapidly, the horsepower of such motors increasing from 299 in 1899 to 1,242 in 1909.

POWER.	NUMBER OF ENGINES OR MOTORS.		HORSEPOWER.		PER CENT DISTRIBUTION OF HORSEPOWER.	
	1909	1899	1909	1899	1909	1899
Primary power, total.	942	347	41,930	10,590	100.0	100.0
Owned.....	843	329	41,354	10,415	98.6	99.1
Steam engines.....	661	253	38,742	18,365	92.4	93.5
Gas and oil engines.....	87	10	1,117	79	2.7	0.4
Water wheels.....	85	66	1,345	971	3.2	5.1
Water motors.....	9	(¹)	147	(¹)	0.4	.....
Other.....	1	.....	3	.....	(²)	.....
Rented.....	99	18	576	175	1.4	0.9
Electric motors.....	99	18	565	175	1.3	0.9
Other.....	.....	.....	11	.....	(²)	.....
Electric motors	189	29	1,807	474	100.0	100.0
Run by current generated by establishment.....	90	11	1,242	299	68.8	63.1
Run by rented power.....	99	18	565	175	31.2	36.9

¹ Not reported.

² Less than one-tenth of 1 per cent.

Fuel.—Closely related to the question of kind of power employed is that of fuel used in generating this power, or otherwise as material in the manufacturing processes. As the Hawaiian Islands have practically no mineral resources, all mineral fuel must be procured elsewhere, principally from the United States. In the sugar-mill industry a large amount of fuel is required, and the refuse from the sugar cane has almost entirely supplied the necessary fuel. The following table shows the quantity of each kind of fuel used by the establishments canvassed in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Gas (1,000 feet).
All industries.....	1,222	4,747	720	14,570	272,392	4,120
Canning and preserving, pineapples.....	.....	212	.....	222	6,302	.....
Rice, cleaning and polishing.....	218	155	.....	120	2,733	650
Sugar.....	419	3,719	.....	10,957	214,365	.....
All other industries.....	585	661	720	3,271	48,992	3,470

NOTE.—In addition, there were 130 tons of other varieties of fuel reported.

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

(With statistics for laundries.)

For certain industries the Census Bureau collects, by means of special schedules, details regarding the quantity and value of materials and products which do not appear on the general schedule. Data for the quantity and value of products for two important industries in Hawaii are here presented.

Canning and preserving, pineapples.—Canning and preserving, though a comparatively new factory industry, had a value of products in 1909 amounting to \$1,591,073. The first shipment of preserved pineapples from Hawaii was made in 1895, the exports for that year amounting to 468 cases, valued at \$972. By 1899 the value of the exports had increased to \$3,948. Soon after the annexation of the islands to the United States in 1898 a more rapid development is shown. In the year last named a company was organized for the growing and canning of pineapples, and in 1903 its first crop of any considerable size was gathered. Meanwhile other companies had come into existence, and by 1904 fruit canneries were established in Wahiawa on Oahu, on Maui, and in Hilo and Kona on the island of Hawaii. In that year the value of canned fruit exported to the United States was \$32,349; in 1905, \$66,876; in 1906, \$152,582; in 1907, \$267,629; in 1908, \$632,277; and in 1909, \$1,229,647. The exports of canned fruit consisted almost entirely of canned pineapples, as very little other fruit was canned.

The following tabular statement gives the number of cases put up during 1909:

SIZE OF CAN.	Number of cases.
1-pound cans.....	22,192
2-pound cans.....	168,902
3-pound cans.....	265,600
Gallon cans.....	42,603

Rice, cleaning and polishing.—The following statement shows the number of establishments engaged in merchant and custom milling, respectively, and in both kinds of milling, together with the value of products of the several classes of establishments in 1909.

Total number of mills.....	74
Merchant.....	35
Custom.....	7
Merchant and custom.....	32
Total value of products.....	\$2,238,667
Merchant milled.....	1,354,267
Custom milled.....	884,400
Value of toll received.....	61,154

The cleaning and polishing of rice ranks second in importance among the manufacturing industries of the Hawaiian Islands, being exceeded only by the manufacture of cane sugar.

Of the 74 mills reported, 35, with products valued at \$1,032,904, are classified as merchant mills; 7, with products valued at \$737,848, as custom mills; and 32, with products valued at \$467,915, as both merchant and custom.

The amount of toll received for custom-treated rice was returned as \$61,154, indicating an average toll rate equivalent to about one-fourth of a cent per pound.

The total quantity of rough rice milled in 1909, distributed according to domestic and foreign growth, and the kind, quantity, and value of products manufactured therefrom are shown in the following tabular statement:

CLASS.	ROUGH RICE MILLED AND RICE PRODUCTS.	
	Quantity (pounds).	Value.
Rough rice, milled.....	62,768,070	(1)
Domestic.....	34,019,055	(1)
Foreign.....	28,749,015	(1)
Rice products, aggregate.....	(1)	\$2,238,667
Clean, total.....	51,967,465	2,134,157
Whole.....	51,381,561	2,122,516
Broken.....	585,904	11,641
Polish.....	10,146	92
Bran.....	6,415,232	67,689
Hulls and waste.....	134,089	134
All other.....	(1)	36,585

¹ Not reported.

The total quantity of rice milled was 62,768,070 pounds, of which only 54.2 per cent was of domestic growth, while 45.8 per cent was of foreign growth. The total quantity of clean rice obtained amounted to 51,967,465 pounds, of which 51,381,561 pounds, valued at \$2,122,516, was classed as whole rice, and 585,904 pounds, valued at \$11,641, as broken rice.

The average quantity of clean rice milled per establishment in 1909 was 702,263 pounds, compared with 365,879 in 1899, an increase of 91.9 per cent. The average value of products per establishment in 1909 was \$30,252, compared with \$16,202 in 1899, an increase of 86.7 per cent. In 1909, 6 establishments reported a value of products of over \$100,000 each; 15, between \$20,000 and \$100,000; 19, between \$5,000 and \$20,000; and 34, less than \$5,000. In 1899 the establishments were generally smaller, and only one establishment reported a value of products of more than \$100,000.

Laundries.—Statistics for steam laundries are not included in the general tables. There were four such establishments in the territory of Hawaii, three of which were in Honolulu.

The following statement summarizes the statistics:

Number of establishments.....	4
Persons engaged in the industry.....	88
Proprietors and firm members.....	4
Salaried employees.....	2
Wage earners (average number).....	82
Primary horsepower.....	65
Capital.....	\$75,355
Expenses.....	34,087
Services.....	24,987
Materials.....	6,613
Miscellaneous.....	2,487
Amount received for work done.....	52,409

One laundry was operated by a corporation, one by a limited partnership, and two by individuals. Two of the establishments reported over \$5,000 but less than \$100,000 as receipts for the year and two less than \$5,000.

The number of wage earners employed each month and the per cent which this number represented of the greatest number employed in any month were as follows:

MONTH.	WAGE EARNERS.		MONTH.	WAGE EARNERS.	
	Number.	Per cent of maximum.		Number.	Per cent of maximum.
January.....	79	76.7	July.....	74	71.8
February.....	77	74.8	August.....	80	77.7
March.....	79	76.7	September.....	78	75.7
April.....	82	79.0	October.....	78	75.7
May.....	88	85.4	November.....	87	84.5
June.....	82	79.0	December.....	103	100.0

The different kinds of primary power, the number of engines, and the horsepower used in manufactures in 1909 are shown in the following tabular statement:

KIND.	Number of engines.	Horsepower.
Primary power, total.....		65
Owned:		
Steam.....	3	55
Gas.....	1	5
Rented—Electric.....	1	5

The kind and amount of fuel used are shown in the following statement:

KIND.	Unit.	Quantity.
Anthracite coal.....	Tons.....	36
Bituminous coal.....	Tons.....	15
Wood.....	Cords.....	31
Oil.....	Barrels.....	103
Gas.....	1,000 feet.....	553

MANUFACTURES—HAWAII.

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TABLE I.—COMPARATIVE SUMMARY FOR 1909 AND 1899.

THE TERRITORY—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

INDUSTRY.	Census.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
			Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
			Expressed in thousands.										
THE TERRITORY—All industries.	1909 1899	500 222	7,572 4,418	1,074 244	594 519	5,904 3,655	41,930 19,590	\$23,875 10,746	\$686 565	\$2,109 1,473	\$25,629 12,251	\$47,404 23,354	\$21,775 11,108
Boot and shoe shops.....	1909 1899	14 14	120 65	31 23	8 3	81 39	4	38 18	2 1	17 11	78 20	126 47	48 27
Bread and other bakery products.....	1909 1899	46 8	180 14	63 10	10	107 4	38	142 2	5	36 1	220 5	344 10	124 5
Carriages and wagons and materials.....	1909 1899	17 7	87 57	14 4	5 2	68 51	25 37	87 81	9 4	33 33	50 50	116 106	66 56
Coffee and spice, roasting and grinding....	1909 1899	4 4	33 26	3 7	2 2	28 17	33 29	23 86	3 3	4 4	36 25	50 38	14 12
Coffee, cleaning and polishing.....	1909 1899	5 6	285 54	203 3	11 4	71 47	237 140	346 70	9 3	12 9	251 60	297 95	46 35
Copper, tin, and sheet-iron products.....	1909 1899	12 12	106 55	14 15	12 4	80 36	18	794 55	10 3	33 22	171 38	304 91	133 53
Food preparations.....	1909 1899	87 27	326 127	148 43	6 2	172 82	41 28	100 23	4 1	36 17	195 25	341 62	146 37
Ice, manufactured.....	1909 1899	5 4	48 25	2	8 4	40 19	271 204	190 137	8 6	24 12	21 16	107 57	86 41
Lumber and timber products.....	1909 1899	8 3	299 40	21 1	24 4	254 35	805 205	403 47	24 7	110 22	97 42	281 91	184 49
Mineral and soda waters.....	1909 1899	22 7	116 46	13 7	20 4	83 35	114 10	214 61	19 4	35 11	74 25	194 89	120 64
Printing and publishing.....	1909 1899	37 10	440 170	19 7	102 31	319 132	117 55	256 110	84 41	147 22	98 33	435 200	337 167
Rice, cleaning and polishing.....	1909 1899	74 41	518 287	346 76	34 18	138 173	1,428 609	716 382	11 12	30 49	1,601 482	2,239 664	638 182
Saddlery and harness.....	1909 1899	6 7	25 28	9 7	2	14 21	.....	29 29	4	6 16	28 47	49 78	21 31
Sugar.....	1909 1899	46 44	2,709 2,759	13 5	179 385	2,517 2,369	36,426 17,774	13,724 7,992	266 364	781 748	18,542 9,778	35,950 19,255	17,408 9,477
All other industries.....	1909 1899	117 28	2,280 685	177 34	171 56	1,932 595	2,373 499	6,813 1,653	228 116	799 496	4,167 1,604	6,571 2,471	2,404 887

CITIES OF 50,000 INHABITANTS OR MORE—ALL INDUSTRIES COMBINED AND SELECTED INDUSTRIES.

Honolulu—All industries.....	1909 1899	286 53	3,194 1,080	443 89	819 92	2,432 929	4,327 1,001	\$8,716 2,244	\$349 168	\$1,080 626	\$6,369 1,971	\$10,705 3,265	\$4,386 1,294
Boot and shoe shops.....	1909 1899	9 6	101 54	25 14	8 3	68 37	4	33 14	2 1	14 10	68 17	110 37	42 20
Copper, tin, and sheet-iron products.....	1909 1899	9 9	101 51	11 12	12 4	78 35	18	792 54	10 3	32 22	170 37	301 88	131 51
Printing and publishing.....	1909 1899	23 6	354 151	12 5	91 28	251 118	95 49	224 93	73 36	127 76	88 31	383 181	295 150
Rice, cleaning and polishing.....	1909 1899	13 4	151 48	82 15	15 4	54 29	611 155	198 157	4 6	14 14	1,028 134	1,447 188	419 54
Saddlery and harness.....	1909 1899	5 4	16 18	7 5	1	8 13	.....	19 20	2	4 11	11 28	24 49	13 21
All other industries.....	1909 1899	177 24	2,471 768	306 18	192 53	1,973 697	3,609 797	7,450 1,906	252 122	889 493	5,004 1,724	8,440 2,722	3,436 998

TABLE II.—DETAIL STATEMENT FOR

INDUSTRY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.										WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY.					Primary horse-power.
		Total.	Proprietors and firm members.	Salaried officers, superintendents, and managers.	Clerks.		Wage earners.					Total.	16 and over.		Under 16.		
					Male.	Female.	Average number.	Number.		Male.	Female.		Male.	Female.			
								Maximum month.	Minimum month.								
1 All industries	500	7,572	1,074	264	817	13	5,904	Jy 6,787	No 3,705	(1)	(1)	(1)	(1)	(1)	41,930		
2 Boot and shoe shops	14	120	31	3	5		81	No ² 80	Ja ² 76	86	85	1			4		
3 Bread and other bakery products	46	180	63	4	4	2	107	Se 110	Ja ² 105	108	98	7	3		38		
4 Canning and preserving, pineapples	10	863		18	17	2	816	Au 1,943	Fe 305	1,202	831	361	9	1	337		
5 Carriages and wagons and materials	17	87	14	5			68	Se 72	Je 63	70	69		1		25		
6 Charcoal	9	13	12				1	De ² 1	Ja ² 0	1	1						
7 Coffee and spice, roasting and grinding	4	33	3	2			28	De 70	Se 9	70	10	60			33		
8 Coffee, cleaning and polishing	5	285	203	8	3		71	Oc 95	Mh 40	83	42	38		3	237		
9 Confectionery	6	44	18	3	2		21	De 25	Jy ² 20	23	21	2					
10 Copper, tin, and sheet-iron products	12	106	14	3	7	2	80	Se 152	Ja ² 26	40	39		1		18		
11 Food preparations	87	326	148	5	1		172	Ja 178	Mh 162	176	146	30			41		
12 Furniture and refrigerators	6	79	18	3	4		54	De 59	My 50	58	57	1			14		
13 Ice, manufactured	5	48		5	3		40	No 44	Ja ² 39	40	33		7		271		
14 Jewelry	6	89	30	4	1		54	No 59	Fe ² 51	58	45	4	9		1		
15 Lumber and timber products	8	299	21	7	16	1	254	Au 271	De 237	237	234		3		805		
16 Mattresses and spring beds	6	43	18	4			21	No 27	Ja ² 18	20	20				34		
17 Millinery and lace goods	7	32	7		1		24	Mh 26	Se ² 22	25	12	12	1		2		
18 Mineral and soda waters	22	116	13	19	1		83	Au 90	Ja ² 75	84	82		2		114		
19 Pickles, preserves, and sauces	6	21	5	1	2		13	Se ² 15	My ² 11	13	13				5		
20 Printing and publishing	37	440	19	20	69	4	319	De 362	Ja 260	362	315	34	12	1	117		
21 Rice, cleaning and polishing	74	518	346	15	19		138	De 153	Je 121	160	166				1,428		
22 Saddlery and harness	6	25	9	2			14	Ja ² 14	No ² 12	14	14				2		
23 Salt	4	14	9				5	Je ² 7	Ja ² 1	4	4						
24 Shipbuilding, including boat building	5	66	5	3	1		57	Je 90	Se 36	68	68				124		
25 Shirts	4	7	4				3	Ja ³ 3	De ³ 3	3	3						
26 Slaughtering and meat packing	10	73	23	8	4	1	37	Ja ² 39	Se 33	39	39				124		
27 Sugar	46	2,709	13	80	99		2,517	Ap 3,508	Oc 970	3,389	3,271	116	2		86,426		
28 All other industries ⁴	38	946	28	33	58	1	826								1,730		

¹ No figures given for reasons explained in the Introduction.

² Same number reported for one or more other months.

³ Same number reported throughout the year.

⁴ All other industries embrace—

Automobile bodies and parts	2	Cars and general shop construction and repairs by street-railroad companies	1	Fertilizers	2
Awnings, tents, and sails	1	Coffins, burial cases, and undertakers' goods	1	Flax and hemp, dressed	2
Cars and general shop construction and repairs by steam-railroad companies	3	Fancy articles, not elsewhere specified	2	Flour-mill and gristmill products	1
				Foundry and machine-shop products	3

MANUFACTURES—HAWAII.

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THE TERRITORY, BY INDUSTRIES: 1909.

	Capital.	EXPENSES.									Value of products.	Value added by manufacture.	
		Total.	Services.			Materials.		Miscellaneous.					
			Officials.	Clerks.	Wage earners.	Fuel and rent of power.	Other.	Rent of factory.	Taxes, including internal revenue.	Contract work.			Other.
1	\$23,874,999	\$31,753,095	\$384,082	\$302,372	\$2,106,903	\$301,578	\$25,327,781	\$108,804	\$1,127,611	\$188,425	\$1,903,589	\$47,403,880	\$21,774,571
2	38,092	111,802	850	1,344	17,159	349	77,771	3,958	503	.....	9,958	126,475	48,355
3	142,277	280,646	3,037	2,086	35,500	12,842	205,733	8,544	1,710	.....	19,033	343,520	123,945
4	2,150,277	1,332,144	32,330	14,956	174,502	13,358	913,233	4,877	8,364	.....	170,524	1,591,073	664,482
5	87,064	104,224	8,550	.....	32,772	3,087	46,645	6,031	810	1,591	4,138	115,642	65,310
6	2,168	971	.....	.....	200	711	.....	.....	.....	.....	60	5,506	4,795
7	23,324	40,351	3,180	.....	3,729	1,117	34,512	462	759	2,256	336	50,127	14,408
8	845,711	274,727	6,357	2,400	12,100	2,913	247,792	150	869	.....	2,140	297,263	46,558
9	29,003	36,003	1,032	750	6,330	615	22,959	1,658	141	.....	2,458	43,162	19,538
10	793,703	247,041	2,047	7,065	32,836	2,781	168,453	14,478	1,530	.....	17,245	303,983	132,749
11	99,665	261,837	3,360	216	30,066	11,437	183,336	9,431	599	177	17,265	341,652	146,279
12	28,882	64,115	2,586	1,072	14,741	147	38,516	3,430	259	.....	2,464	69,752	31,089
13	190,279	76,703	6,015	2,469	23,903	17,626	3,860	.....	3,089	.....	19,781	107,111	85,725
14	33,836	84,619	3,010	300	24,143	611	50,095	2,550	319	.....	3,291	111,335	60,329
15	403,249	275,123	9,425	14,281	109,647	4,233	93,226	5,323	2,447	.....	36,544	281,325	183,866
16	35,959	29,826	2,780	.....	7,511	323	15,809	1,370	259	.....	1,769	37,908	21,771
17	13,530	23,305	.....	600	7,398	525	17,856	1,260	38	.....	718	32,994	14,613
18	213,760	155,731	18,500	960	35,391	4,249	70,063	1,848	2,474	.....	22,248	194,273	119,961
19	34,910	25,926	900	636	2,522	1,055	16,048	703	178	.....	3,854	33,572	16,439
20	255,667	384,953	32,868	50,727	146,830	5,744	92,740	13,276	1,560	3,958	37,250	434,770	336,295
21	715,735	1,692,997	6,662	4,593	35,522	14,520	1,586,228	6,037	4,982	.....	34,403	2,238,607	637,919
22	29,309	42,197	3,960	.....	6,065	.....	27,779	2,230	258	357	1,548	49,163	21,384
23	3,228	4,091	.....	.....	1,518	16	777	1,053	42	.....	685	5,698	4,905
24	91,865	91,045	4,180	300	40,714	2,011	31,965	4,527	1,019	.....	6,269	105,463	71,487
25	3,355	6,033	.....	.....	600	10	3,975	532	78	.....	838	7,630	3,645
26	289,498	812,163	5,640	2,069	20,095	8,652	733,597	1,718	971	.....	39,421	863,785	121,506
27	13,724,308	22,042,499	146,075	120,141	781,280	127,440	18,414,635	175	1,055,178	179,546	1,218,029	35,949,822	17,407,747
28	4,096,280	3,231,891	80,738	73,817	499,709	64,371	2,226,128	13,135	39,169	540	231,284	3,662,800	1,369,301

⁴ All other industries embrace—Continued.

Gas, illuminating and heating.....	1	Monuments and tombstones.....	1	Roofing materials.....	1
Hats, straw.....	2	Musical instruments and materials, not specified ..	1	Soap.....	1
Lime.....	1	Paints.....	1	Starch.....	2
Liquors, distilled.....	2	Patent medicines and compounds and druggists' preparations.....	2	Statuary and art goods.....	1
Liquors, malt.....	3				
Liquors, vinous.....	1				

PORTO RICO.

INDUSTRIES IN GENERAL.

General character of the territory.—Porto Rico is the smallest and most easterly of the four Greater Antilles (Cuba, Haiti, Jamaica, and Porto Rico), its area being 3,435 square miles. It was ceded formally to the United States by Spain under the treaty of Paris, December 11, 1898. On May 1, 1900, a civil government was established, and on July 25, 1901, a proclamation was issued by the President declaring that free trade existed between the United States and Porto Rico.

In 1910 the population was 1,118,012. This population is distributed evenly over the entire island, only 9.9 per cent living in cities of 10,000 inhabitants and over. San Juan, with a population of 48,716 in 1910, is the largest city. Three other cities have a population of more than 10,000: Ponce, with 35,005; Mayaguez, with 16,563; and Caguas, with 10,354. The density of population of the island is 325 per square mile, the corresponding figure for 1899 being 278.

Favorable climatic conditions, excellent drainage,

and unusually productive soil have made the island well adapted for agriculture, upon which its manufactures are directly dependent. In the lowland plains, only a little above the level of the sea, the soil is alluvial and rich, and here the sugar cane, the island's most productive crop, is grown. On the slopes of the upland hills, from 600 to 2,400 feet above sea level, tobacco and coffee thrive, these crops ranking second and third in importance. Of the total area, about 95 per cent is returned as in farms, and of the total farm acreage 75.3 per cent is reported as improved.

Importance and growth of manufactures.—The manufacture of sugar and molasses, the making of cigars and cigarettes, and the cleaning and polishing of coffee are the most important manufacturing industries of Porto Rico.

The following table gives the more important figures relative to all classes of manufactures combined for the territory, as returned at the census of 1909:

	Number or amount, 1909		Number or amount, 1909
Number of establishments.....	939	Expenses.....	\$31,139,000
Persons engaged in manufactures.....	18,122	Services.....	4,898,000
Proprietors and firm members..	1,478	Salaries.....	1,259,000
Salaried employees.....	1,062	Wages.....	3,639,000
Wage earners (average number).	15,582	Materials.....	21,479,000
Primary horsepower.....	34,005	Miscellaneous.....	4,762,000
Capital.....	\$25,544,000	Value of products.....	36,750,000
		Value added by manufacture (value of products less cost of materials).	15,271,000

In 1909 the territory of Porto Rico had 939 manufacturing establishments, which gave employment to an average of 18,122 persons during the year and paid out \$4,898,000 in salaries and wages. Of the persons employed, 15,582 were wage earners. These establishments turned out products to the value of \$36,750,000, to produce which materials costing \$21,479,000 were consumed. The value added by manufacture was thus \$15,271,000, which figure best represents the net wealth created by manufacturing operations during the year.

The present census of manufactures was the first taken in Porto Rico, and for that reason the statistics can not be compared with any earlier figures. A census of agriculture was taken in 1899, under the direction of the Secretary of War, and, considering the dependency of manufacturing upon agriculture in the case of Porto Rico, furnishes a general basis to indicate the progress of manufactures subsequent to the acquisition of the island by the United States.¹ The progress

¹ See, also, Report of H. K. Carroll, special commissioner to Porto Rico; Report of the Military Governor on Civil Affairs, 1900; Bulletin of the Bureau of Labor, No. 61, 1905; and the Report of the Bureau of Statistics on Commercial Porto Rico in 1906.

of manufactures during the past 10 years is also indicated by the amount of exports, since but a comparatively small proportion of the manufactured products is consumed locally. This is especially true in respect to sugar and molasses, coffee, and cigars and cigarettes, which have together formed from 85 to 90 per cent of the total exports during the past few years.

The following tabular statement gives the total value of exports for the years ending June 30, 1901, to 1909:

FISCAL YEAR ENDING JUNE 30—	Exports.
1909.....	\$30,391,225
1908.....	30,644,490
1907.....	26,996,300
1906.....	23,287,530
1905.....	18,709,565
1904.....	16,285,903
1903.....	15,089,079
1902.....	12,433,956
1901.....	8,583,967

Of the total value of exports for the fiscal year ending June 30, 1909, \$18,924,491 represented the value of raw sugar and of molasses, \$3,715,744 that of coffee,

and \$4,413,891 that of cigars and cigarettes; these three classes of exports together contributing 89 per cent of the total.

The relative importance of the leading manufacturing industries of the territory are shown in the following table:

INDUSTRY.	Number of establishments.	WAGE EARNERS.		VALUE OF PRODUCTS.		VALUE ADDED BY MANUFACTURE.	
		Average number.	Per cent distribution.	Amount.	Per cent distribution.	Amount.	Per cent distribution.
All industries.....	939	15,582	100.0	\$36,750,000	100.0	\$15,271,000	100.0
Sugar and molasses.....	108	5,062	32.5	20,569,000	56.0	8,295,000	54.3
Tobacco manufactures.....	282	7,025	45.1	6,060,000	16.5	4,082,000	26.2
Coffee, cleaning and polishing.....	37	120	0.8	5,053,000	13.7	289,000	1.9
Bread and other bakery products.....	258	1,197	7.7	1,730,000	4.7	557,000	3.6
Liquors, distilled.....	14	58	0.4	1,117,000	3.0	974,000	6.4
Printing and publishing.....	43	353	2.3	371,000	1.0	235,000	1.5
Lumber and timber products.....	8	123	0.8	269,000	0.7	91,000	0.6
Boot and shoe shops.....	59	303	1.9	190,000	0.5	92,000	0.6
Cars and general shop construction and repairs by steam-railroad companies.....	6	342	2.2	186,000	0.5	125,000	0.8
Foundry and machine-shop products.....	6	188	1.2	178,000	0.5	120,000	0.8
Hats, straw.....	3	122	0.8	177,000	0.5	91,000	0.6
Leather, tanned, curried, and finished.....	4	46	0.3	176,000	0.5	85,000	0.6
All other industries.....	111	643	4.1	674,000	1.8	318,000	2.1

The most important industries listed in this table, where they are arranged in the order of the value of products, call for brief consideration.

Sugar and molasses.—This industry is by far the most important manufacturing industry in the island. The value of its products formed 56 per cent, and the value added by manufacture 54.3 per cent, of the respective totals for all industries.

Tobacco manufactures.—This industry was practically confined to the manufacture of cigars and cigarettes, and all but two of the establishments were engaged in the manufacture of cigars only. Of the 282 cigar and cigarette factories reported, 45 were engaged in manufacturing cigars or cigarettes either wholly or partially for export. The value of tobacco manufactures intended for local consumption approximated \$1,500,000, or about 25 per cent of the total value of all tobacco manufactures. From the standpoint of the number of employees this industry is of greater importance than the manufacture of sugar, reporting 45.1 per cent of all wage earners, as compared with 32.5 per cent for the latter industry.

Coffee, cleaning and polishing.—While this is one of the characteristic industries of the territory and its value of products was relatively large, forming 13.7 per cent of the total for all manufacturing industries, it gave employment to an average of only 120 wage earners.

Bread and other bakery products.—The large number of establishments engaged in this industry is due to the fact that domestic bread making is not carried on extensively, and practically all the bread consumed on the island is made by persons who make a specialty of this line of work, which is conducted in small shops. This industry gave employment to an average of 1,197 wage earners, and the value of the products amounted to \$1,730,000.

Liquors, distilled.—This industry depends directly on the sugar and molasses industry for its raw material. Its products are principally alcohol and rum.

Measured by value added by manufacture, these industries held generally the same relative rank as when measured by value of products, though liquors, distilled, becomes third in order instead of coffee, cleaning and polishing, which, in turn, becomes fifth. The five industries represent 92.4 per cent of the total value added by manufacture.

Among the industries not listed separately in the table the canning and preserving of pineapples, the manufacture of chocolate and cocoa products, and the manufacture of bay rum and alcoholado may be mentioned as peculiar to the tropical climate of Porto Rico.

Persons engaged in manufacturing industries.—The following table shows the distribution of the average number of persons engaged in manufactures, the average number of wage earners being distributed by sex and age in the manner already explained in the Introduction.

CLASS.	PERSONS ENGAGED IN MANUFACTURES.		
	Total.	Male.	Female.
All classes.....	18,122	16,300	1,822
Proprietors and officials.....	1,786	1,635	151
Proprietors and firm members.....	1,478	1,331	147
Salaried officers of corporations.....	44	44	.....
Superintendents and managers.....	264	260	4
Clerks.....	754	737	17
Wage earners (average number).....	15,582	13,928	1,654
16 years of age and over.....	14,824	13,268	1,556
Under 16 years of age.....	758	660	98

This table shows that there were 18,122 persons returned as the average number engaged in manufactures during 1909, of whom 15,582 were wage earners, 1,786 officials, and 754 clerks. The large proportion of proprietors and firm members was due to the unusual number of general and limited partnerships, the former being composed for the most part of the so-called family partnerships, and the latter

being in some respects similar to the corporate form of ownership. Corresponding figures for individual industries will be found in Table II.

In considering this table it should be noted that several of the industries are peculiarly seasonal, so that the number employed during certain months is far greater than the average number for the entire year. The variation in the number employed is very pronounced in the sugar and molasses industry, which for several months gave employment to only about 2,200 wage earners, while during the busy season over 8,400 were employed.

The following table shows the percentage of proprietors and officials, clerks, and wage earners, respectively, in the total number of persons employed in manufactures. It covers all industries combined and five important industries.

INDUSTRY.	PER CENT OF PERSONS ENGAGED IN MANUFACTURES.			
	Total.	Proprietors and officials.	Clerks.	Wage earners (average number).
All industries.....	100.0	9.9	4.2	86.0
Bread and other bakery products.....	100.0	25.3	1.6	73.1
Coffee, cleaning and polishing.....	100.0	48.9	7.6	43.5
Liquors, distilled.....	100.0	48.9	8.1	43.0
Sugar and molasses.....	100.0	6.2	7.7	85.8
Tobacco manufactures.....	100.0	5.2	1.7	93.1
All other industries.....	100.0	15.0	4.5	80.5

Of the persons engaged in all manufacturing industries, 9.9 per cent were officials, 4.2 per cent clerks, and 86 per cent wage earners. In the cleaning and polishing of coffee and in the manufacture of distilled liquors a large number of establishments are conducted by individuals and general and limited partnerships, and the work is done to a great extent by the proprietors and partners. Therefore the proportion of persons engaged in these industries falling in the class of proprietors and officials is very high, namely, 48.9 per cent in each case. A much smaller proportion is shown for this class in the two industries sugar and molasses and tobacco manufactures.

The following table shows, for 1909, in percentages, for all industries combined and for some of the important industries separately, the distribution of clerks by sex and of wage earners by age periods and sex:

INDUSTRY.	CLERKS.		WAGE EARNERS (AVERAGE NUMBER).			
	Per cent.		Per cent 16 years of age and over.		Per cent under 16 years of age.	
	Male.	Female.	Male.	Female.	Male.	Female.
All industries.....	97.7	2.3	85.1	10.0	4.2	0.6
Bread and other bakery products.....	100.0	.....	98.3	.....	1.7	.....
Coffee, cleaning and polishing.....	100.0	.....	75.0	25.0	.....	.....
Liquors, distilled.....	100.0	.....	94.8	.....	5.2	.....
Sugar and molasses.....	98.2	1.8	91.1	1.4	7.4	(1)
Tobacco manufactures.....	96.0	4.0	78.9	17.9	2.0	1.2
All other industries.....	96.6	3.4	84.5	9.2	5.7	0.6

¹ Less than one-tenth of 1 per cent.

Of the clerks, 97.7 per cent were male and 2.3 per cent female. Of the wage earners, 89.3 per cent were male and 10.6 per cent female; 95.1 per cent were 16 years and over and but 4.8 per cent were under 16 years.

It may be noted that the largest number of women are employed in the manufacture of tobacco, while the sugar and molasses industry gives employment to the largest number of children. Of the 1,654 female wage earners in all industries combined, 1,342, or 81.1 per cent, were employed in the manufacture of tobacco; and of the 758 wage earners in all industries under 16 years of age, 601, or 79.3 per cent, were in the two industries last named. With the tobacco industry omitted the females over 16 in all other industries combined would be 3.5 per cent of the total number of wage earners, and with the two industries tobacco manufactures and sugar and molasses omitted, persons of both sexes under 16 years of age, 4.5 per cent.

Wage earners employed, by months.—The following table gives the number of wage earners employed on the 15th of each month during the year 1909 for all industries combined, for sugar and molasses, and for all other industries combined; it also gives the percentage which the number each month is of the greatest number employed in any one month:

MONTH.	WAGE EARNERS.					
	All industries.		Sugar and molasses.		All other industries	
	Number.	Per cent of maximum.	Number.	Per cent of maximum.	Number.	Per cent of maximum.
January.....	17,461	96.2	7,365	87.6	10,096	80.6
February.....	18,151	100.0	8,323	99.0	9,828	84.3
March.....	17,812	98.1	8,403	100.0	9,409	80.7
April.....	17,789	98.0	8,161	97.1	9,628	82.5
May.....	17,416	96.0	7,332	87.3	10,084	80.5
June.....	15,101	83.2	4,515	53.7	10,586	90.8
July.....	13,683	75.4	2,878	34.2	10,805	92.0
August.....	13,009	71.7	2,301	27.4	10,708	91.8
September.....	13,079	72.1	2,231	26.6	10,848	93.0
October.....	13,457	74.1	2,238	26.6	11,219	90.2
November.....	13,683	75.4	2,320	27.6	11,373	97.5
December.....	16,335	90.0	4,671	55.6	11,664	100.0

The single industry of sugar and molasses, which is a seasonal industry, giving employment to a large number of persons from January to May, inclusive, and to comparatively few from June to December, affects greatly the total for all industries combined. It thus not only makes the month of February the month of greatest employment, but also magnifies the irregularity of employment throughout the year. Outside the sugar and molasses industry the number of wage earners employed apparently underwent but little change, the numbers showing a gradual and almost uninterrupted increase from March to December and a falling off from December to March.

Prevailing hours of labor.—Establishments have been classified also according to the prevailing number of hours of labor of the bulk of their employees; that is to say, the wage earners of each establishment are all classified according to the prevailing hours of labor in the establishment, even though some may have to work a

different number of hours. The table that follows shows the result of this classification. It is based on the average number of wage earners employed during

the year. In the case of sugar and molasses this average is far less than the number employed in the busy season.

INDUSTRY.	AVERAGE NUMBER OF WAGE EARNERS IN ESTABLISHMENTS GROUPED ACCORDING TO PREVAILING HOURS OF WORK PER WEEK.								
	Total.	48 and under.	Between 48 and 54.	54.	Between 54 and 60.	60.	Between 60 and 72.	72.	Over 72.
All industries.....	15,582	7,007	197	1,938	336	1,290	1,695	2,303	816
Boot and shoe shops.....	303	125	4	51	.....	97	19	7	.....
Bread and other bakery products.....	1,197	268	84	0	274	.....	229	28	315
Cars and general shop construction and repairs by steam-railroad companies.....	342	.....	.....	.....	.....	200	27	.....	19
Coffee, cleaning and polishing.....	120	12	.....	19	7	34	14	32	2
Food preparations.....	122	91	.....	.....	.....	31	.....	.....	.....
Foundry and machine-shop products.....	188	.....	.....	160	.....	10	.....	.....	.....
Hats, straw.....	122	58	.....	64	.....	.....	.....	.....	.....
Leather, tanned, curried, and finished.....	46	10	.....	20	.....	2	14	.....	.....
Liquors, distilled.....	58	14	.....	3	.....	17	2	.....	22
Lumber and timber products.....	123	77	14	14	.....	18	.....	.....	.....
Printing and publishing.....	353	287	11	37	13	.....	5	.....	.....
Sugar and molasses.....	5,062	213	9	198	27	604	1,307	2,218	426
Tobacco manufactures.....	7,025	5,630	58	1,221	15	82	12	7	.....
All other industries.....	521	232	17	133	.....	90	0	11	32

It is evident from these figures that for nearly one-half of the wage earners employed in the manufacturing industries of Porto Rico the prevailing hours of labor are 48 or under per week, or not over 8 hours per day. Of those working the number of hours named, by far the greater number were employed in the tobacco industry. The next largest group of wage earners was that made up of those employed 72 hours per week, or 12 hours per day. Most of those falling in this group were employed in the sugar and molasses industry.

The tobacco factories, which furnish steady employment throughout the year to a larger number of wage earners than any other manufacturing industry, operated generally 48 hours or less per week. Only 116

wage earners, or 1.7 per cent of the total for the industry, were employed in establishments which were operated more than 54 hours per week, while 5,630 wage earners, or 80.1 per cent of the total, were employed in establishments which were operated 48 hours or less. On the other hand, in the sugar mills, 4,615 wage earners, or 91.2 per cent of the total for the industry, worked 60 hours or more per week, while only 447, or 8.8 per cent of the total, worked less than 60 hours. Indeed, in the sugar industry 2,644 wage earners, or 52.2 per cent of the total, worked 72 hours or more per week.

Location of establishments.—The following table shows to what extent manufacturing is centralized in cities having a population of 10,000 and over:

ITEM.	Year.	Aggregate.	CITIES HAVING A POPULATION OF 10,000 AND OVER.						DISTRICTS OUTSIDE OF CITIES HAVING A POPULATION OF 10,000 AND OVER.	
			Total.		10,000 to 25,000.		25,000 and over.		Number or amount.	Per cent of total.
			Number or amount.	Per cent of total.	Number or amount.	Per cent of total.	Number or amount.	Per cent of total.		
Population.....	1910	1,118,012	110,638	9.9	26,917	2.4	83,721	7.5	1,007,374	90.1
Number of establishments.....	1909	939	178	19.0	71	7.6	107	11.4	701	81.0
Average number of wage earners.....	1909	15,582	4,272	27.4	551	3.5	3,721	23.9	11,310	72.6
Value of products.....	1909	\$36,749,742	\$8,022,273	21.8	\$2,379,558	6.5	\$5,642,715	15.4	\$28,727,469	78.2
Value added by manufacture.....	1909	\$15,270,450	\$3,418,479	22.4	\$592,487	3.8	\$2,835,992	18.6	\$11,851,971	77.6

The population of Porto Rico is overwhelmingly rural, only 9.9 per cent living in cities of 10,000 inhabitants and over. Likewise the factories of the island are located largely in rural districts and small towns and are not concentrated to any extent in the cities.

The group of cities having a population of 10,000 to 25,000 includes Mayaguez and Caguas, and the group having a population of 25,000 and over includes San Juan and Ponce. A comparison of the figures for the two groups shows a larger percentage of the population employed in manufacturing and a greater per capita value added by manufacture in the second

group than in the first, but a larger per capita value of products in the first group than in the second. This seeming anomaly is due to the fact that the principal industry in the first group, and particularly in Mayaguez, was the cleaning and polishing of coffee, in which industry the work done on the raw material and the consequent increase in value through manufacture is small, as compared with the value of the commodity. In San Juan and Ponce, on the other hand, the manufacture of tobacco is the chief industry, and in this industry the work done upon the raw material and the consequent increase in value through manufacture is much greater.

While Mayaguez has only about half the population of Ponce, a far larger number of establishments were located in the former, and the total value of its products was nearly equal to that of Ponce.

The coffee cleaning and polishing industry contributed 68.3 per cent of the total value of manufactures reported for Mayaguez, and 64.8 per cent of that reported for Mayaguez and Caguas combined. This industry requires the services of only a few men in comparison with the number required in the tobacco factories of San Juan and Ponce.

Character of ownership.—The table that follows has for its purpose the presentation of conditions in respect to the character of ownership, or legal organization, of manufacturing enterprises in 1909.

INDUSTRY AND CHARACTER OF OWNERSHIP.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES	939	15,582	\$36,749,742	\$15,270,450
Individual.....	672	3,652	4,781,300	1,945,685
Firm.....	195	3,263	12,886,383	4,162,516
Corporation.....	63	8,608	18,977,267	9,131,971
Other.....	9	59	104,792	30,278
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	71.6	23.4	13.0	12.7
Firm.....	20.8	20.9	35.1	27.3
Corporation.....	6.7	55.2	51.6	59.8
Other.....	1.0	0.4	0.3	0.2
Bread and other bakery products	258	1,197	\$1,729,886	\$556,450
Individual.....	217	973	1,390,367	443,275
Firm.....	36	179	278,446	96,374
Corporation ¹	5	45	61,073	16,801
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	84.1	81.3	80.4	79.7
Firm.....	14.0	15.0	16.1	17.3
Corporation ¹	1.9	3.8	3.5	3.0
Coffee, cleaning and polishing	37	120	\$5,052,599	\$288,339
Individual.....	7	13	582,585	54,963
Firm.....	30	107	4,470,014	233,376
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	18.9	10.8	11.5	19.1
Firm.....	81.1	89.2	88.5	80.9
Liquors, distilled	14	58	\$1,117,084	\$973,645
Individual.....	4	11	110,030	91,967
Firm.....	7	31	604,959	578,646
Corporation.....	3	16	342,095	303,032
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	28.6	19.0	9.8	9.4
Firm.....	50.0	53.4	59.5	59.4
Corporation.....	21.4	27.6	30.6	31.1
Sugar and molasses	108	5,062	\$20,569,348	\$8,295,793
Individual.....	51	546	1,328,809	495,153
Firm.....	34	1,449	6,111,086	2,434,686
Corporation.....	23	3,037	13,129,453	5,365,974
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	47.2	10.8	6.5	6.0
Firm.....	31.5	28.6	29.7	29.3
Corporation.....	21.3	60.6	63.8	64.7
Tobacco manufactures	282	7,025	\$6,080,393	\$4,002,848
Individual.....	240	1,386	728,839	501,089
Firm.....	28	875	537,913	404,458
Corporation.....	14	4,764	4,793,641	3,097,301
Per cent of total.....	100.0	100.0	100.0	100.0
Individual.....	85.1	19.7	12.0	12.5
Firm.....	9.9	12.5	8.9	10.1
Corporation.....	5.0	67.8	79.1	77.4

¹ Includes the group "Other," to avoid disclosure of individual operations.

In 1909 only 63 incorporated companies were engaged in manufactures, and, with the exception of the 37 engaged in the sugar and the tobacco industries, they were not large. While only 6.7 per cent of all establishments were under this form of ownership, they were credited with 51.6 per cent of the total value of

products and 59.8 per cent of the total value added by manufacture. In the sugar and molasses and tobacco industries the establishments under corporate ownership, though greatly in the minority, were credited with 63.8 per cent and 79.1 per cent, respectively, of the total value of products of the respective industries. This disproportionately large value added by manufacture shown for establishments under corporate ownership for all industries combined is to a great extent due to the tobacco industry.

The firm or partnership occupies in Porto Rico an unusually conspicuous place as a form of ownership. In 1909, 36 limited partnerships were reported manufacturing products valued at \$4,938,272, and 159 general partnerships manufacturing products valued at \$7,948,111. The largest number of establishments, 672, is shown for the individual form of ownership, but their value of products amounted to only \$4,781,300, or 13 per cent of the total. Three cooperative associations engaged in the manufacture of bread and other bakery products, four religious orders and societies, one trade union, and the Territorial Government Bureau of Printing and Supplies comprised the "Other" forms of ownership.

Size of establishment.—The tendency for manufacturing to become concentrated in large establishments, or the reverse, is a matter of interest from the standpoint of industrial organization. In order to throw some light upon it, the next table groups the establishments according to the value of their products. The table also shows the average size of establishments for all industries combined, and for important industries separately, as measured by number of wage earners, value of products, and value added by manufacture.

This table shows that in 1909, of the 939 establishments only 6, or 0.6 per cent, had a value of products exceeding \$1,000,000. These establishments, however, notwithstanding their small number, had a total average number of wage earners of 4,300, or 27.6 per cent of the total number in all establishments; and the importance of their operations, as measured by value of products, was 26.1 per cent of the total, and by value added by manufacture 31.4 per cent of the total.

On the other hand, small establishments—that is, those having a value of products of less than \$5,000—constituted a very considerable proportion (61.1 per cent) of the total number of establishments, but the value of their products amounted to only 3 per cent of the total. The great bulk of the manufacturing was carried on in establishments having products valued at not less than \$100,000.

In some respects, and especially from the standpoint of conditions under which persons engaged in manufactures work, the best classification of establishments to bring out the feature of size is a classification according to the number of wage earners employed. The second table on page 1398 shows such a classification for all industries combined and for five important industries, and gives not only the number of establishments falling in each group, but also the average number of wage earners employed.

MANUFACTURES—PORTO RICO.

INDUSTRY AND VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.	INDUSTRY AND VALUE OF PRODUCT.	Number of establishments.	Average number of wage earners.	Value of products.	Value added by manufacture.
ALL INDUSTRIES	939	15,582	\$36,749,742	\$15,270,450	Liquors, distilled	14	58	\$1,117,084	\$973,645
Less than \$5,000.....	574	1,824	1,104,697	577,073	\$5,000 and less than \$20,000 ¹	5	7	38,808	35,201
\$5,000 and less than \$20,000.....	216	1,925	2,065,216	887,803	\$20,000 and less than \$100,000.....	5	14	172,830	144,679
\$20,000 and less than \$100,000.....	77	2,743	3,839,985	1,724,835	\$100,000 and less than \$1,000,000.....	4	37	905,451	793,765
\$100,000 and less than \$1,000,000.....	66	4,790	20,160,343	7,279,773	Per cent of total.....	100.0	100.0	100.0	100.0
\$1,000,000 and over.....	6	4,300	9,579,501	4,809,966	\$5,000 and less than \$20,000 ¹	35.7	12.1	3.5	3.0
Per cent of total.....	100.0	100.0	100.0	100.0	\$20,000 and less than \$100,000.....	35.7	21.1	15.5	14.9
Less than \$5,000.....	61.1	11.7	3.0	3.8	\$100,000 and less than \$1,000,000.....	23.0	63.8	81.1	81.5
\$5,000 and less than \$20,000.....	23.0	12.4	5.6	5.8	Average per establishment.....	.....	4	\$79,792	\$69,546
\$20,000 and less than \$100,000.....	8.2	17.6	10.4	11.3	Sugar and molasses	108	5,062	\$20,569,348	\$8,295,793
\$100,000 and less than \$1,000,000.....	7.0	30.7	54.9	47.7	Less than \$5,000.....	48	201	78,344	37,353
\$1,000,000 and over.....	0.6	27.6	26.1	31.4	\$5,000 and less than \$20,000.....	12	120	115,558	44,946
Average per establishment.....	.....	17	\$39,137	\$16,292	\$20,000 and less than \$100,000.....	8	223	440,007	153,678
Bread and other bakery products	258	1,197	\$1,729,886	\$556,450	\$100,000 and less than \$1,000,000.....	37	3,122	13,651,857	5,398,587
Less than \$5,000.....	131	340	350,174	111,184	\$1,000,000 and over.....	3	1,390	6,283,582	2,658,229
\$5,000 and less than \$20,000.....	117	701	1,087,359	346,493	Per cent of total.....	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	10	156	292,353	98,773	Less than \$5,000.....	44.4	4.0	0.4	0.5
Per cent of total.....	100.0	100.0	100.0	100.0	\$5,000 and less than \$20,000.....	11.1	2.4	0.6	0.5
Less than \$5,000.....	50.8	28.4	20.2	20.0	\$20,000 and less than \$100,000.....	7.4	4.4	2.1	1.9
\$5,000 and less than \$20,000.....	45.3	58.6	62.9	62.3	\$100,000 and less than \$1,000,000.....	31.3	61.7	66.4	65.1
\$20,000 and less than \$100,000.....	3.9	13.0	16.9	17.8	\$1,000,000 and over.....	2.8	27.0	30.5	32.0
Average per establishment.....	.....	5	\$6,705	\$2,157	Average per establishment.....	.....	47	\$190,457	\$76,813
Coffee, cleaning and polishing	37	120	\$5,052,599	\$288,339	Tobacco manufactures	282	7,025	\$8,060,393	\$4,002,348
\$5,000 and less than \$20,000 ¹	7	13	89,963	9,932	Less than \$5,000.....	231	850	370,544	251,526
\$20,000 and less than \$100,000.....	13	44	767,539	55,723	\$5,000 and less than \$20,000.....	27	500	245,669	166,300
\$100,000 and less than \$1,000,000.....	17	63	4,185,097	222,684	\$20,000 and less than \$100,000.....	14	1,312	855,957	616,045
Per cent of total.....	100.0	100.0	100.0	100.0	\$100,000 and less than \$1,000,000.....	7	1,450	1,292,304	826,240
Less than \$5,000.....	18.9	10.8	1.8	3.4	\$1,000,000 and over.....	3	2,001	3,295,910	2,142,737
\$5,000 and less than \$20,000.....	35.1	36.7	15.2	19.3	Per cent of total.....	100.0	100.0	100.0	100.0
\$20,000 and less than \$100,000.....	45.9	52.5	83.0	77.2	Less than \$5,000.....	91.0	12.1	6.1	6.3
\$100,000 and less than \$1,000,000.....	.....	.....	.....	.....	\$5,000 and less than \$20,000.....	8.0	7.1	4.1	4.2
Average per establishment.....	.....	3	\$130,557	\$7,793	\$20,000 and less than \$100,000.....	5.0	18.7	14.1	15.4
					\$100,000 and less than \$1,000,000.....	2.5	20.8	21.3	20.6
					\$1,000,000 and over.....	1.1	41.3	54.4	53.5
					Average per establishment.....	.....	25	\$21,491	\$14,194

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

INDUSTRY.	Total.	ESTABLISHMENTS EMPLOYING—								
		No wage earners.	Under 6 wage earners.	6 to 20 wage earners.	21 to 50 wage earners.	51 to 100 wage earners.	101 to 250 wage earners.	251 to 500 wage earners.	501 to 1,000 wage earners.	Over 1,000 wage earners.
NUMBER OF ESTABLISHMENTS.										
All industries.....	939	17	623	196	42	29	26	3	1	9
Bread and other bakery products.....	258	1	194	62	1	.....	.....	.....	.....	.....
Coffee, cleaning and polishing.....	37	.....	32	5	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	14	.....	11	3	.....	.....	.....	.....	.....	.....
Sugar and molasses.....	108	.....	43	18	17	10	12	1	1	.....
Tobacco manufactures.....	282	.....	196	55	9	6	12	2	.....	2
All other industries.....	240	16	147	53	15	7	2	.....	.....	.....
PER CENT OF NUMBER OF ESTABLISHMENTS.										
All industries.....	100.0	1.8	66.3	20.9	4.5	3.1	2.8	0.3	0.1	0.2
Bread and other bakery products.....	100.0	0.4	75.2	24.0	0.4	.....	.....	.....	.....	.....
Coffee, cleaning and polishing.....	100.0	.....	86.5	13.5	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	100.0	.....	78.6	21.4	.....	.....	.....	.....	.....	.....
Sugar and molasses.....	100.0	.....	39.8	16.7	15.7	14.8	11.1	0.9	0.9	.....
Tobacco manufactures.....	100.0	.....	69.5	19.5	3.2	2.1	4.3	0.7	.....	0.7
All other industries.....	100.0	6.7	61.2	22.1	6.2	2.9	0.8	.....	.....	.....
AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	15,582	.....	1,771	1,970	1,331	1,983	4,059	1,114	833	2,521
Bread and other bakery products.....	1,197	.....	603	571	23	.....	.....	.....	.....	.....
Coffee, cleaning and polishing.....	120	.....	78	42	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	58	.....	25	33	.....	.....	.....	.....	.....	.....
Sugar and molasses.....	5,062	.....	114	222	583	1,137	1,796	377	839	.....
Tobacco manufactures.....	7,025	.....	568	544	264	411	1,680	737	.....	2,521
All other industries.....	2,120	.....	383	558	461	435	283	.....	.....	.....
PER CENT OF AVERAGE NUMBER OF WAGE EARNERS.										
All industries.....	100.0	.....	11.4	12.6	8.5	12.7	26.0	7.2	5.3	16.2
Bread and other bakery products.....	100.0	.....	50.4	47.7	1.9	.....	.....	.....	.....	.....
Coffee, cleaning and polishing.....	100.0	.....	65.0	35.0	.....	.....	.....	.....	.....	.....
Liquors, distilled.....	100.0	.....	43.1	56.9	.....	.....	.....	.....	.....	.....
Sugar and molasses.....	100.0	.....	2.3	4.4	11.5	22.5	35.5	7.4	16.5	.....
Tobacco manufactures.....	100.0	.....	8.1	7.7	3.8	5.9	28.2	10.5	.....	35.9
All other industries.....	100.0	.....	18.1	26.3	21.7	20.5	13.3	.....	.....	.....

This table shows classes in considerable detail. Consolidating these classes to a certain extent it will be seen that 89 per cent of the establishments employed under 21 persons each. The most numerous single group consists of the 623 establishments employing under 6 wage earners; the next being the group employing from 6 to 20, with 196 establishments. There were 6 establishments that employed over 250 wage earners; 2 employed over 1,000.

Of the total number of wage earners, 28.7 per cent were in establishments employing over 250 wage earners. The single group having the largest number of employees was the group employing from 101 to 250 wage earners. This group employed 4,059 wage earners, or 26 per cent of the total. Two of the individual industries listed in this table, sugar and molasses and tobacco manufactures, are industries in which comparatively large establishments do most of the business, as appears from the classification of the wage earners.

Expenses.—As stated in the Introduction, the census does not purport to furnish figures that can be used for determining the cost of manufacture and profits. Facts of interest can, however, be brought out concerning the relative importance of the different classes of expenses going to make up the total.

The following table shows, for 1909, in percentages, the distribution of expenses among the classes indicated for all industries combined and for certain important industries separately. The figures on which the percentages are based appear in Table II.

INDUSTRY.	PER CENT OF TOTAL EXPENSES REPORTED.			
	Salaries.	Wages.	Materials.	Miscellaneous expenses.
All industries.....	4.0	11.7	69.0	15.3
Bread and other bakery products.....	0.7	22.7	72.8	3.8
Coffee, cleaning and polishing.....	0.3	0.7	98.7	0.4
Liquors, distilled.....	1.4	1.5	13.7	83.4
Sugar and molasses.....	5.7	7.4	73.9	13.0
Tobacco manufactures.....	3.0	28.4	39.5	29.2
All other industries.....	6.3	28.3	58.2	7.2

This table shows that, for all industries combined, 69 per cent of the total expenses was incurred for materials, 15.7 per cent for services—that is, salaries and wages—and 15.3 per cent for other purposes. The unusually large amount reported for miscellaneous expenses is due in part to the internal-revenue taxes, Federal and insular, paid on tobacco and distilled liquors, and also to the large amount reported in the sugar and molasses industry under the general head of "Rent of offices and buildings, rent of machinery, royalties, use of patents, insurance, ordinary repairs of buildings and machinery, advertising, traveling, and other sundry expenses."

Engines and power.—The following table shows for all industries combined the number of engines or other motors, according to their character, employed in gen-

erating power (including electric motors operated by purchased current), and their total horsepower at the census of 1909. It also shows separately the number and horsepower of electric motors, including those operated by current generated in the manufacturing establishments.

POWER.	Number of engines or motors.	Horsepower.	Per cent distribution of horsepower.
Primary power, total.....	682	34,005	100.0
Owned.....	577	33,504	98.7
Steam.....	499	32,409	95.6
Gas.....	53	842	2.5
Water wheels.....	17	183	0.5
Water motors.....	1	12	(¹) 0.1
Other.....	7	28	
Rented—Electric.....	85	441	1.3
Electric motors.....	115	1,385	100.0
Run by current generated by establishment.....	30	944	68.2
Run by rented power.....	85	441	31.8

¹ Less than one-tenth of 1 per cent.

This table indicates that practically all the power reported was generated by steam and gas engines. Thirty electric motors, with a total of 944 horsepower, were run by current generated in the establishments, while 85 motors, with a total of 441 horsepower, were run by rented power. Although the water power available is very great, and almost constant the year round, comparatively little was used in the manufacturing industries of Porto Rico in 1909.

Of the total horsepower for all industries, by far the greater part, 31,055 horsepower, or 91.3 per cent, was employed in one industry, namely, the sugar and molasses industry. The tobacco factories required little power, and the factories engaged in the cleaning and polishing of coffee, which used the second largest amount of power, reported an aggregate of only 1,085 primary horsepower. Of the 939 establishments engaged in manufacturing in 1909, only 221 reported mechanical power in any form.

Fuel.—Closely related to the question of kind of power employed is that of the fuel used in generating this power, or otherwise as material in the manufacturing processes. Porto Rico has no mineral fuel, and its wood supply is being depleted as manufactures increase. The following table shows the quantity of each kind of fuel used in 1909:

INDUSTRY.	Anthracite coal (tons).	Bituminous coal (tons).	Coke (tons).	Wood (cords).	Oil, including gasoline (barrels).	Other (tons).
All industries.....	946	41,988	368	43,513	1,086	520
Bread and other bakery products.....	5	.....	6	13,444	75	.....
Coffee, cleaning and polishing.....	128	1,293	234	2,846	33	.....
Liquors, distilled.....	200	2,712	.....	737	.....	.....
Sugar and molasses.....	.....	31,808	.....	19,656	365	275
Tobacco manufactures.....	.....	790	.....	.....	17	.....
All other industries.....	613	5,385	128	6,830	540	245

SUPPLEMENTARY DATA REGARDING IMPORTANT INDUSTRIES.

For certain industries the Census Bureau collects details regarding the quantity and value of materials and products which do not appear on the general schedule. Data for the quantity and value of products for three important industries in Porto Rico are here presented.

Sugar and molasses.—A total of 566,445,203 pounds of raw sugar and 17,874,097 gallons of molasses was reported as manufactured during 1909. The total value of the raw sugar was \$20,164,887, of the molasses \$397,008, and of all other products \$7,453, or an aggregate value of products of \$20,569,348. As already stated, this industry is the leading manufacturing industry of the island. The modern methods and machinery installed in recent years have increased the production of sugar, but the quantity of molasses produced has remained about stationary. In 1909 there were no refineries in Porto Rico, and all the sugar used and exported was the raw brown sugar. Cane sugar only was produced.

Tobacco manufactures.—The quantity of cigarettes and the value of cigars and cigarettes can not be published separately without disclosing the operations of individual establishments, but a total of 217,792,000 cigars was reported as manufactured during 1909. Of this number, 152,739,000, or about 70 per cent, were for export and the remainder for local consumption. On the other hand, only 2.3 per cent of the cigarettes manufactured were for export.

While the tobacco plant is indigenous to the island, its cultivation was, prior to 1870, confined to small plantings for domestic consumption. The tobacco exports ranked third in value up to 1905. In that year they were practically equal to those of coffee, and since 1907 have greatly exceeded them. As this industry and the sugar and molasses industry have prospered, the coffee industry has declined. The land used for coffee is well adapted to tobacco growing, and upon legislation permitting the importation of tobacco from Porto Rico into the United States practically free of duty, the growers planted these lands in tobacco.

At the same time, the manufacturers of cigars and cigarettes began to pay more attention to the quality of the material used and to the skill of the labor employed.

Coffee, cleaning and polishing.—The coffee tree is not native to the island, but was introduced there in the first half of the eighteenth century. The first exports of coffee are reported to have occurred in 1765 and were of small value. By 1879, however, the raising of coffee had become an important industry, and from 1890 to 1898 it increased to such an extent that the value of the exports far exceeded those of sugar and molasses.

Practically all of the coffee raised goes through a complete or partial process of cleaning, hulling, polishing, and grading to prepare it for the market. The total quantity of rough coffee treated in 1909 was 65,225,378 pounds. The total quantity of cleaned and polished coffee obtained was 44,350,435 pounds. All but 5 of the 37 coffee mills reported the process of polishing the coffee. The product of these 5 mills, which cleaned, hulled, and dried the berry without polishing it, amounted to only 1,153,695 pounds.

The modern wet process is superseding the older dry method, but requires a larger investment than the small planters can afford. The result is that the business of preparing the coffee for market is being transferred from the plantation to the large custom mills.

The following statement shows the number of coffee cleaning and polishing establishments engaged in merchant and in custom work, together with the value of products of the several classes of establishments in 1909:

Total number of mills.....	37
Merchant.....	26
Custom.....	7
Merchant and custom.....	4
Amount received for toll.....	\$35,270
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Total value of products.....	\$5,052,599
Merchant milled.....	2,899,491
Custom milled.....	2,153,108

TABLE I.—SUMMARY FOR MUNICIPALITIES HAVING A POPULATION OF 10,000 AND OVER: 1909.

CITY.	Number of establishments.	PERSONS ENGAGED IN INDUSTRY.				Primary horse-power.	Capital.	Salaries.	Wages.	Cost of materials.	Value of products.	Value added by manufacture.
		Total.	Proprietors and firm members.	Salaried employees.	Wage earners (average number).							
Expressed in thousands.												
Total for municipalities.....	178	4,869	296	801	4,272	4,148	\$4,262	\$232	\$1,060	\$4,604	\$8,023	\$8,419
San Juan.....	70	3,046	100	196	2,750	748	2,644	136	673	1,209	3,243	2,034
Ponce.....	37	1,082	56	55	971	2,880	1,342	71	252	1,598	2,400	802
Mayaguez.....	66	645	118	48	479	484	253	24	110	1,750	2,250	506
Caguas.....	15	96	22	2	72	30	23	1	16	47	124	77

MANUFACTURES—PORTO RICO.

TABLE II.—DETAIL STATEMENT FOR THE TERRITORY, BY INDUSTRIES: 1909.

Table with columns: INDUSTRY, PERSONS ENGAGED IN INDUSTRY (Total, Proprietors, Clerks, Wage earners), WAGE EARNERS—NUMBER DEC. 15, OR NEAREST REPRESENTATIVE DAY (Total, 16 and over, Under 16), Primary horse-power, Capital. Rows include THE TERRITORY - All industries, Bay rum and alcoholado, Boot and shoe shops, Bread and other bakery products, etc.

Table with columns: INDUSTRY, EXPENSES (Total, Services, Materials, Miscellaneous), Value of products, Value added by manufacture. Rows include THE TERRITORY - All industries, Bay rum and alcoholado, Boot and shoe shops, Bread and other bakery products, etc.

1 No figures given for reasons explained in the Introduction.
2 Same number reported for one or more other months.
3 None reported for one or more other months.
4 All other industries embrace—

Summary table for footnote 4: Boxes, cigar; Brooms; Food preparations; Hosiery and knit goods; Matches; Mattresses and spring beds; Mineral and soda waters; Oil, essential; Patent medicines and compounds and druggists' preparations; Pottery, terra-cotta, and fire-clay products.