BEET SUGAR.

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By GUILFORD L. SPENCER, *Expert Special Agent.*

Reports were received from 30 establishments engaged in the manufacture of beet sugar during the census year ending May 31, 1900, and also from 1 factory equipped for the industry, which was idle. While these factories are distributed in 10 states and 1 territory, it is impossible to publish separate totals, except for the states of California and Michigan, without disclosing the operations of individual establishments.

TABLE 1.—SUMMARY: 1900.

STATES AND TERRITORIES.	Number of establishments.	Capital.	OFFICERS OF CORPORATIONS.		SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products at works.
			Number.	Salaries.	Number.	Salaries.	Average number.	Total wages.			
United States.....	[1]31	$20,958,519	48	$114,300	302	$242,375	1,970	$1,092,207	$451,351	$4,803,796	$7,323,857
California	[1]8	10,139,780	11	39,900	111	77,980	909	480,072	169,449	2,243,580	3,499,996
Michigan.....	9	4,013,743	20	33,400	98	68,293	478	216,704	77,262	1,109,903	1,602,266
All other states.....	14	6,804,996	17	41,000	93	96,102	583	395,431	204,640	1,450,313	2,221,595

[1] Includes 1 idle establishment.

The total of "all other states," shown in this and subsequent tables, includes establishments distributed as follows: Colorado, 1; Illinois, 1; Minnesota, 1; Nebraska, 3; New Mexico, 1; New York, 2; Oregon, 1; Utah, 3; Washington, 1. The statistics for these factories are grouped in order to avoid disclosing the operations of individual factories.

Of the 31 factories, 29 were controlled by incorporated companies, and 2 by individuals.

TABLE 2.—CAPITAL INVESTED: 1900.

STATES AND TERRITORIES.	Total.	Land.	Buildings.	Machinery, tools, and implements.	Cash and sundries.
United States...	[1] $20,958,519	$682,705	$3,891,371	$14,420,325	$1,964,118
California	[1]10,139,780	349,969	1,825,153	7,309,447	655,211
Michigan.....	4,013,743	143,036	925,980	2,414,349	530,378
All other states.....	6,804,996	189,700	1,140,238	4,696,529	778,529

[1] Includes 1 idle establishment.

The total capital invested in beet-sugar manufacture in 1899, the year's work reported in the present bulletin, was $20,958,519, of which $682,705 is reported for land, $3,891,371 for buildings, $14,420,325 for machinery, and $1,964,118 for cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries. The item "land" is not intended to include farm lands, but in view of the considerable area required by the factories for storage, disposal of waste water, etc., and to provide for the future growth of the establishments, it has not been practicable to eliminate a small area now utilized for agricultural purposes. In many instances large tracts of land are owned by the companies and devoted to agriculture.

At the census of 1890 reports were received from only 2 beet-sugar factories, and, therefore, to avoid disclosing the operations of individual establishments, the statistics for the industry were not separately reported, but the value of the product is estimated by the writer to have been $340,000. No estimate of the capital invested can be made.

In 1879, 4 factories were in operation and were reported at the Tenth Census. The total capital invested was $365,000, and the value of the products was $282,572.[1] Few single factories reported in the Twelfth Census have so small an investment as the combined capital of the 4 in operation in 1879.

[1] See Tenth Census, Manufactures, pp. 94, 101, 127.

TABLE 3.—NOMINAL DAILY FACTORY CAPACITY, AND CAPITAL INVESTED PER TON OF BEETS: 1900.

STATES AND TERRITORIES.	Number of establishments.	Total capacity per day.	Average daily capacity per factory.	CAPITAL INVESTED PER TON OF DAILY CAPACITY.				
				Total capital.	Land.	Buildings.	Machinery and tools.	Cash and sundries.
United States..	[1] 31	*Tons.* [2] 219,110	*Tons.* 616	$1,097	$36	$204	$754	$103
California	[1] 8	9,900	1,238	1,024	35	185	788	66
Michigan.....	9	4,100	456	979	35	226	589	129
All other states..	14	[2] 5,110	364	1,334	37	224	921	152

[1] Includes 1 idle establishment.
[2] Includes 1 auxiliary factory at which no sugar is manufactured, but juice is extracted from the beets and pumped to a central factory for treatment.

In estimating the capital required in the organization of new companies for the manufacture of beet sugar, an assumed average capital per ton of beets, daily factory capacity, is frequently used as a factor. It is for this reason that these figures are included in Table 3.

There are many conditions which modify the average capital invested per ton of nominal capacity. Among these are the following: (1) the cost of a large factory is less per ton of capacity than that of a small one; (2) freight charges for the transportation of machinery vary with the distance of the site of the factory from the foundry in which the machinery is made; (3) the cost is necessarily greater in the case of those factories which are equipped for the recovery of sugar from molasses, from which no more sugar can be profitably extracted by the process of crystallization; (4) many factories have machinery of relatively small capacity so disposed in a large building as to permit of increasing the capacity of the plant without additional expense for buildings.

The Michigan factories were built within two years and under similar conditions in the iron market; with one exception, they are of American construction.

TABLE 4.—NUMBER AND NOMINAL DAILY CAPACITY OF ESTABLISHMENTS IN 1900, 1899, AND 1898.

STATES AND TERRITORIES.	1900.		1899.		1898.	
	Number of establishments.	Nominal daily capacity in tons of beets.	Number of establishments.	Nominal daily capacity in tons of beets.	Number of establishments.	Nominal daily capacity in tons of beets.
United States.....	[1] 37	22,310	[2] 31	19,110	15	7,560
California	8	9,900	[2] 8	9,900	5	4,400
Colorado	3	1,850	1	350	.....	.....
Illinois	1	700	1	700	.....	.....
Michigan.....	10	4,450	9	4,100	1	400
Minnesota.....	1	400	1	400	1	400
Nebraska.....	3	1,260	3	1,260	2	660
New Mexico.....	1	200	1	200	1	200
New York.....	3	1,000	2	400	2	400
Ohio.....	1	400	.....	.....	.....	.....
Oregon	1	350	1	350	1	350
Utah	4	[3] 1,450	3	[4] 1,100	2	750
Washington	1	350	1	350	.....	.....

[1] Includes 2 idle establishments.
[2] Includes 1 idle establishment.
[3] Includes 2 auxiliary factories.
[4] Includes 1 auxiliary factory at which no sugar is manufactured, but juice s extracted from the beets and pumped to a central factory for treatment.

TABLE 5.—EMPLOYEES AND WAGES: 1900.

STATES AND TERRITORIES.	OFFICERS OF CORPORATIONS.		SALARIED OFFICIALS, CLERKS, ETC.				AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES PAID.					
	Number.	Salaries.	Men, number.	Salaries.	Women, number.	Salaries.	Men, 16 years and over.	Wages.	Women, 16 years and over.	Wages.	Children, under 16 years.	Wages.
United States.....	48	$114,300	287	$235,657	15	$6,718	1,951	$1,085,218	4	$1,685	15	$5,304
California	11	39,900	107	75,687	4	2,343	903	477,306	3	1,565	3	1,201
Michigan.....	20	33,400	90	65,706	8	2,587	471	215,334	1	120	1	750
All other states.....	17	41,000	90	94,314	3	1,788	577	392,078	.....	.....	11	3,353

In beet sugar factories the length of the manufacturing year is dependent upon agricultural conditions. The factories are operated only a part of the calendar year, but after the close of the manufacturing season, many of the employees, especially foremen and skilled laborers, are engaged for a few months in making repairs and improvements. The majority return to work on farms or in other industries. The manufacture begins at a time when there is comparatively little demand for farm labor, except in harvesting sugar beets, and thus, in a measure, it fills out the year for the farm laborer. When comparing the average earnings with the averages reported for other industries, these facts should be considered.

TABLE 6.—COST OF MATERIALS USED: 1900.

STATES AND TERRITORIES.	Total.	Sugar beets.	Fuel.	Mill supplies.	Freight paid.	All other materials.
United States ...	$4,803,796	$3,485,320	$458,036	$18,933	$369,070	[1] $477,437
California.....	2,243,580	1,585,953	253,185	10,011	205,286	189,145
Michigan	1,109,903	902,592	90,969	2,840	26,839	86,663
All other states	1,450,313	996,775	108,882	6,082	136,945	201,629

[1] Includes $51,000, cost of sugar beet juice.

The small value of the products, $7,323,857, is due to an enormous shortage in the crop of sugar beets for the year ending May 31, 1900. In all branches of sugar manufacture the years of plentiful harvests must carry

the industry over the years of failure, and yield a return that will make the average earnings justify the investments.

Of the 16 new factories, 15 of which were operated for the first time in 1899, several were not completed when the harvest was ready, and in some instances there were serious losses from deterioration of the beets. As a whole, there was an apparent small profit earned by the factories; in certain cases handsome dividends were paid, in others there were heavy losses, and in many instances the factories little more than paid expenses.

In addition to the factories operated in the census year, 6, including 1 auxiliary factory at which beet juice was extracted but no sugar manufactured, were under construction for the crop of 1900. A report of these new factories not being required, the figures given are only approximate. The capital invested in new factories is $3,800,000, making a total of $24,758,519 for the new industry in the year 1900.

Of the 30 factories in operation during the census year, 10 reported the total value of their products for the preceding business year as aggregating $1,838,681. The same factories reported a product valued at $2,426,522 for the census year.

The acreage actually contracted for in 1899 was 135,305, as shown in Table 7. Because of the shortage of the crop in various parts of the country, particularly in California, beets were actually harvested from but 105,175 acres, and the average yield from this land, 8 tons (of 2,000 pounds) per acre, was very unsatisfactory. The average yield of beets for Germany[1] for the crops of 1896–97, 1897–98, and 1898–99, respectively, was 14, 14, and 13 tons per acre.

The acreage seeded for the crop of 1900, including that for 6 new factories having a total nominal daily capacity of 3,200 tons of beets, was only 123,400, whereas approximately 200,000 acres would have been required fully to supply the demand of the 36 factories in operation during that year.

[1] "Zeitschrift des Vereins für die Rübenzucker-Industrie des Deutschen Reichs." Supplement to the number for March, 1900.

TABLE 7.—ACREAGE IN BEETS, AND QUANTITIES AND COST OF BEETS USED, BY STATES: 1900.

STATES AND TERRITORIES.	TOTAL.			BEETS GROWN BY FACTORY PROPRIETORS.			BEETS GROWN BY TENANTS OF FACTORY PROPRIETORS.			BEETS GROWN BY CONTRACT BY OTHERS THAN TENANTS OF FACTORY PROPRIETORS.			AVERAGE QUALITY OF BEETS.	
	Acres in beets.	Tons of beets (2,000 pounds).	Cost.	Acres in beets.	Tons of beets (2,000 pounds).	Cost.	Acres in beets.	Tons of beets (2,000 pounds).	Cost.	Acres in beets.	Tons of beets (2,000 pounds).	Cost.	Per cent of sucrose.	Coefficient of purity.
United States	135,305	794,658	$3,485,320	10,239	23,241	$93,898	13,074	95,071	$430,479	111,992	676,346	$2,960,943	14.5	81.2
California	63,878	354,942	1,585,953	7,526	10,645	42,718	12,762	93,294	422,704	43,590	251,003	1,120,531	15.9	81.2
Michigan	37,034	205,925	902,592	28	218	511				37,006	205,707	902,081	13.3	82.9
All other states	34,393	233,791	996,775	2,685	12,378	50,669	312	1,777	7,775	31,396	219,636	938,331	13.6	79.7

The average price paid per ton of 2,000 pounds of beets was as follows:

The United States	$4.39
California	$4.47
Michigan	4.38
All other states and territories	4.26

In California 4 factories purchased beets at a fixed price, and 4 paid a price depending upon the results of the analysis. In Michigan 9 factories purchased on a basis of the analysis, paying $4 per ton for beets containing 12 per cent of sugar, with 3⅓ cents increase for each one-tenth per cent above 12, and a corresponding decrease for each one-tenth per cent below 12, as provided by the state bounty law, recently declared unconstitutional.

Of the factories in other parts of the United States, 8 purchased on a basis of the analysis of the beets, and 6 paid a fixed price. The New York factories paid $5 per ton for beets, irrespective of their sugar contents, in accordance with the state bounty law.

TABLE 8.—QUANTITIES OF MATERIALS USED: 1900.

STATES AND TERRITORIES.	Sugar beets.	Limestone.	Coke.	Sulphur.	Barrels.	Sacks.	FUEL.		
							Coal.	Oil.	Wood.
	[1] *Tons.*	[1] *Tons.*	[1] *Tons.*	[1] *Tons.*			*Tons.*	*Gallons.*	*Cords.*
United States	794,658	64,805	7,519	149	90,985	1,342,649	109,235	7,017,079	3,459
California	354,942	32,403	3,274	51	1,301	891,924	8,558	7,004,415	.....
Michigan	205,925	15,403	2,079	40	79,468	76,796	47,979	.....	.....
All other states	233,791	16,999	2,166	58	10,216	373,929	52,698	12,664	3,459

[1] Tons of 2,000 pounds each.

It is customary in compiling sugar statistics to report the miscellaneous materials used in percentage terms of the weight of beets worked, or the cost of such materials is reduced to a basis of one ton of raw material. The general totals furnished in reply to the census inquiries can not be used for the purpose of making such calculations.

It is apparent, however, from a study of the schedules, that the fuel consumption was large. Owing to the use of other fuels than coal in a number of factories, the consumption of coal per 100 pounds of beets can be figured only for Michigan factories, where it was 23 pounds. This proportion is nearly one and one-half times as great as in good European practice. In considering these figures, however, it should be noted that 8 of the 9 factories in Michigan were operated for the first time during the season of 1899–1900 and that there was doubtless a large coal consumption in testing plants, and during delays incident to adjusting new machinery. It should be stated further that the grade of coal used by these factories was inferior to that with which the European records have been made. The average cost of coal at the factories in Michigan was $1.90 per ton, or an average expense of 44 cents per ton of beets worked. Several of the Michigan factories used less than 16 pounds of coal per 100 pounds of beets.

The nominal horsepower of the boilers in American beet sugar factories is approximately 58,000.

TABLE 9.—QUANTITIES AND VALUES OF PRODUCTS: 1900.

STATES AND TERRITORIES.	TOTAL VALUE OF ALL PRODUCTS.	SUGARS.						MOLASSES.		BEET PULP.	JUICE.	LIME.	FERTILIZERS.
		Total.		Granulated.		Raw.							
		Pounds.	*Value.*	*Pounds.*	*Value.*	*Pounds.*	*Value.*	*Gallons.*	*Value.*	*Value.*	*Value.*	*Value.*	*Value.*
United States ...	$7,323,857	163,458,075	$7,222,581	115,686,356	$5,580,527	47,771,719	$1,642,054	[1] 3,551,856	$25,102	$21,822	$51,000	$642	$2,710
California	3,499,996	86,741,713	3,490,318	43,839,911	2,049,726	42,901,802	1,440,592	1,708,501	.....	6,968	.....	.....	2,710
Michigan	1,602,266	33,708,283	1,600,284	32,737,098	1,561,100	971,185	39,184	321,100	1,225	241	.....	516	.....
All other states	2,221,595	43,008,079	2,131,979	39,109,347	1,969,701	3,898,732	162,278	1,522,255	23,877	14,613	51,000	126	.....

[1] Includes quantities for which no value could be given, also wastage.

Deducting the raw sugar reported to be melted in the crop of 1900 (3,462,700 pounds) from the total amount of raw sugar manufactured (47,771,719 pounds), there remain 44,309,019 pounds, which may be properly credited as this year's output of raw sugar, and the total output of granulated and raw sugar is therefore 159,995,375 pounds, or 71,427 tons of 2,240 pounds. White granulated sugar formed 72.3 per cent of the total quantity of sugar manufactured, and raw sugar for refining, 27.7 per cent.

A quantity of raw sugar or low grade massecuite is carried forward each year by most of the factories, which renders it impracticable to ascertain the exact quantity of sugar manufactured from the beets grown in any one year. Assuming that the factories operated in 1898 carried forward to the next crop relatively the same quantity of sugar as in 1899, and deducting this amount and crediting the sugar carried forward in 1899 to the crop of that year, we obtain a total of 161,474,100 pounds, or 203 pounds of sugar per ton of beets, or 10 pounds of sugar per 100 pounds of beets, as the yield from beets grown in the census year. In view of the high average percentage of sugar in the beets, as shown in Table 7, page 4, this yield is disappointing. It is probably in a measure due to the deterioration of beets at new factories not fully prepared for work when the roots were harvested. Such deterioration was reported at several factories.

Molasses.—The statistics of the quantity and value of the molasses product shown in Table 9 are misleading, since large quantities were reported for which no value could be assigned, and large quantities ran to waste. The value reported, $25,102, represents only the portion sold, or for which there was an assured market.

Beet Juice.—The beet juice reported was the product of an auxiliary plant and was pumped to the central factory.

Beet Pulp, Lime, and Fertilizers.—Beet pulp is a very valuable by-product in European beet sugar manufacture, and finds a ready market. At most of the American factories the demand for pulp is small, this by-product being frequently given to the farmers in consideration of its removal. The value of the pulp sold was $21,822. No figures could be obtained showing the quantity of pulp produced. Based on the usual yield of pressed pulp, the total product amounted to approximately 400,000 tons.

Small quantities of lime and lime-cake or filter press-cake were sold, the latter for use as a fertilizer. The value of the lime sold was $642, and of the lime-cake or fertilizer, $2,710.

For purposes of comparison the beet sugar production of Europe and the United States is given in Table 10.

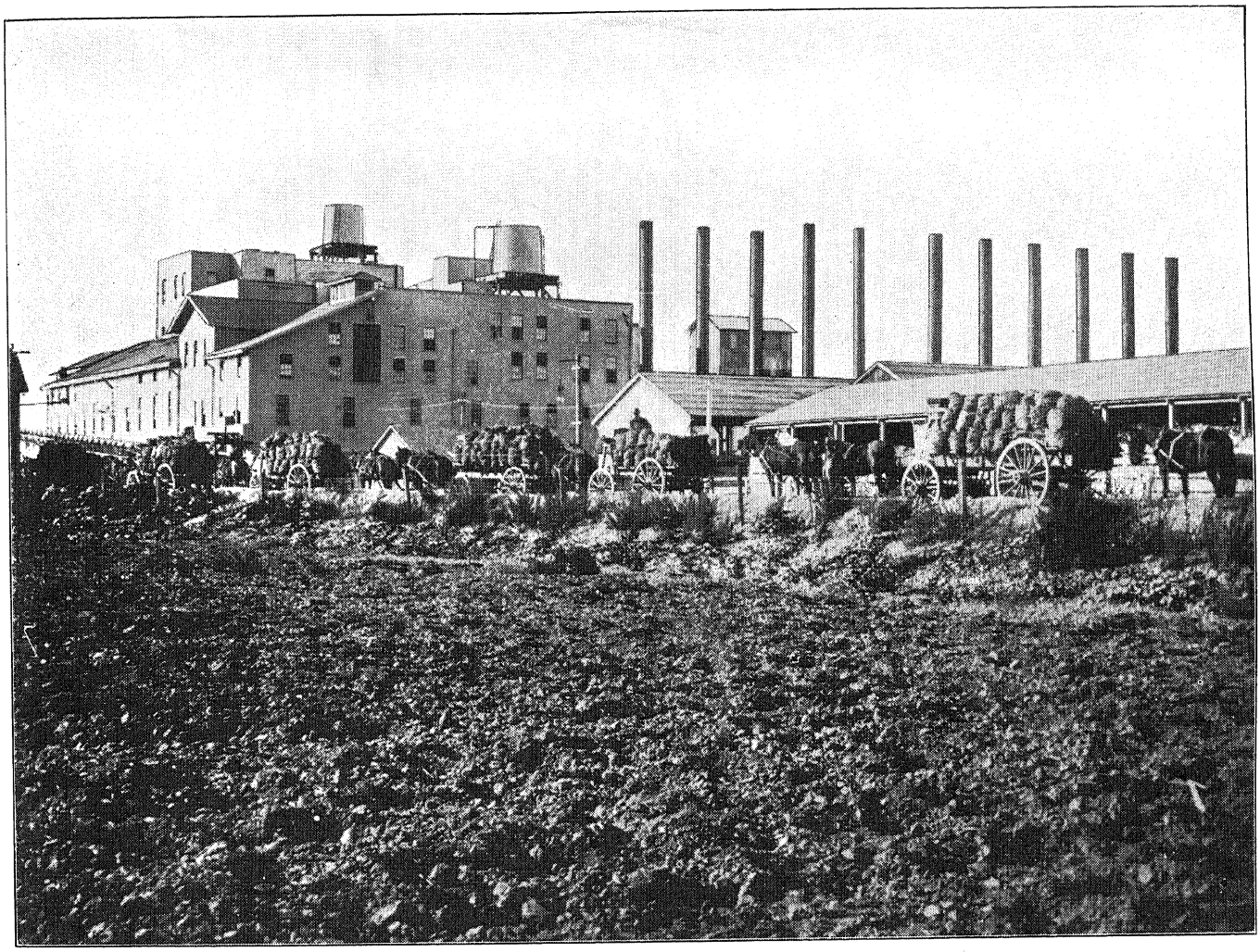


FIG. 1.—ALVARADO FACTORY, ALVARADO, CAL.—1900.

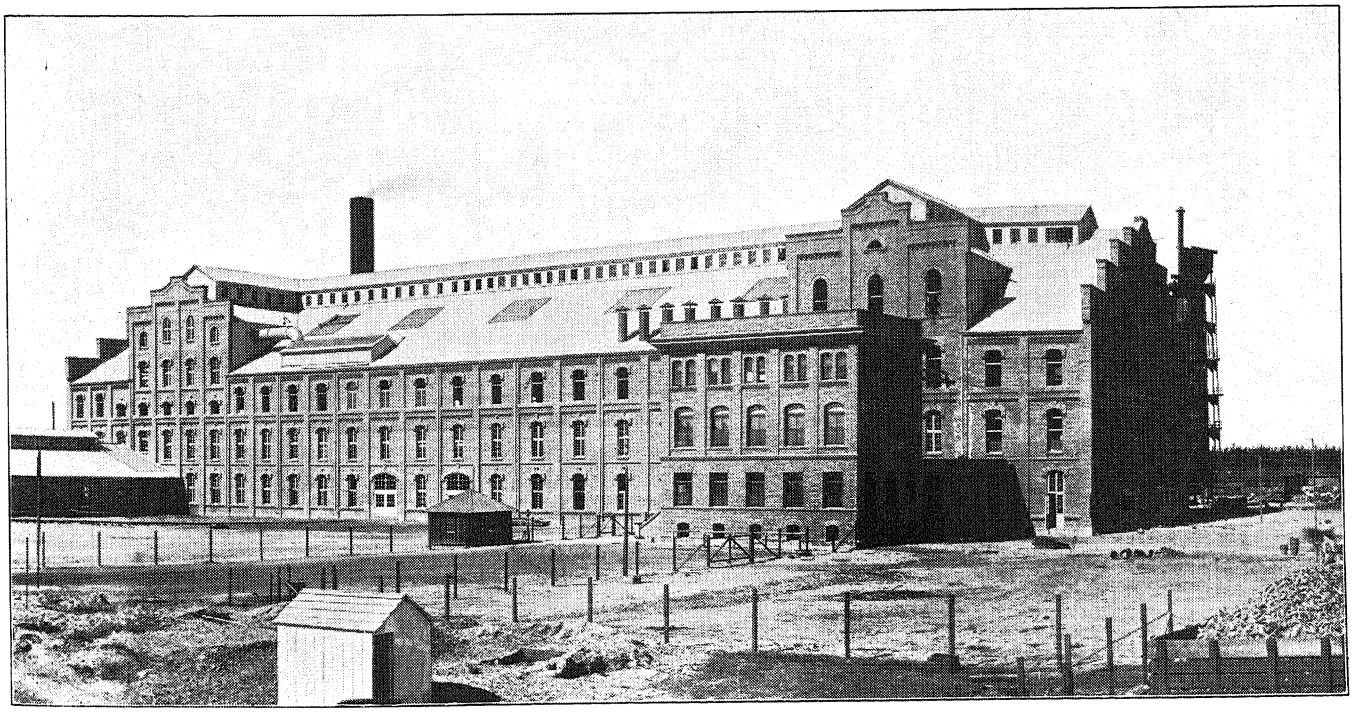


FIG. 2.—AMERICAN BEET SUGAR COMPANY'S FACTORY, OXNARD, CAL.

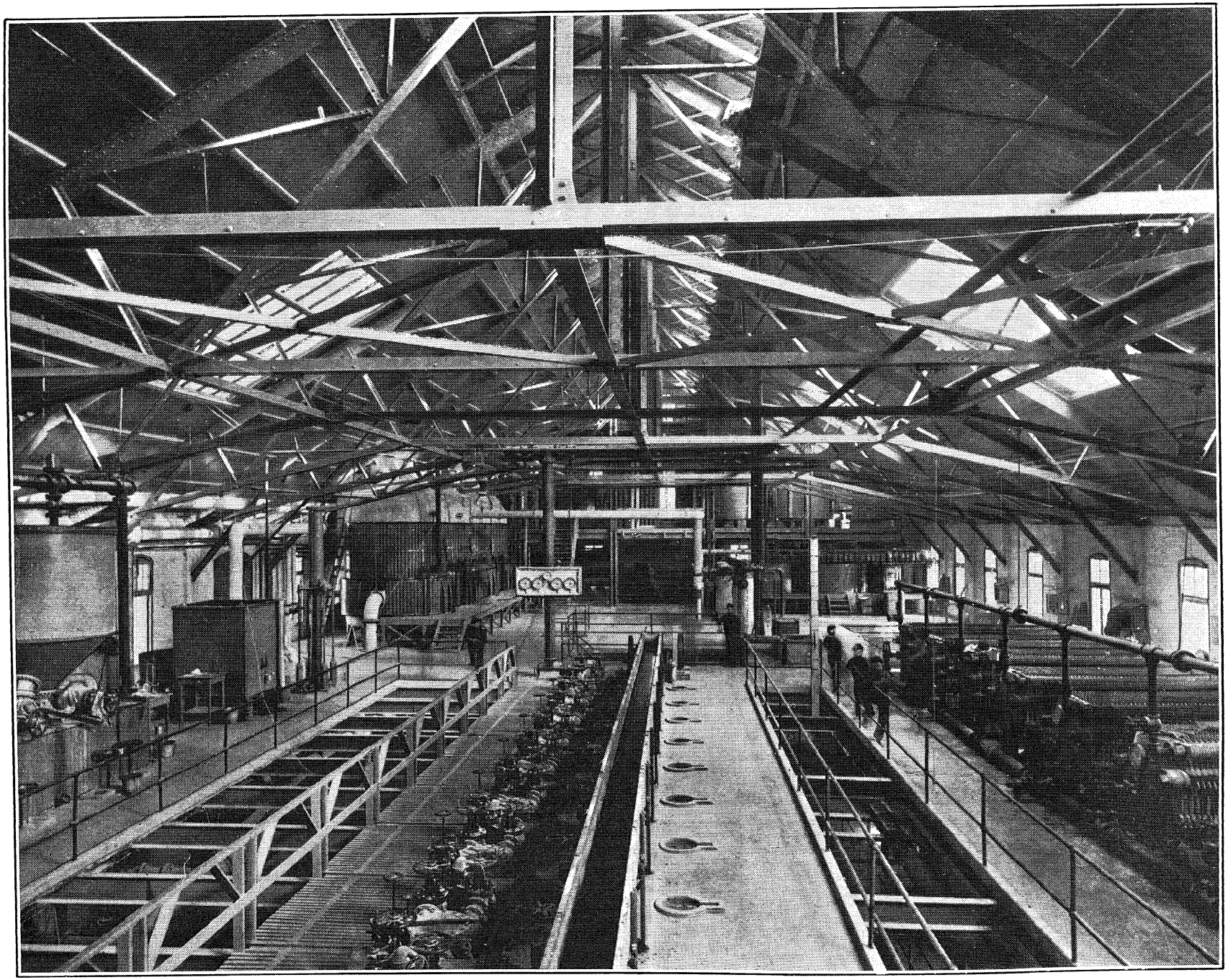


FIG. 3.—INTERIOR VIEW, STANDARD BEET SUGAR COMPANY'S FACTORY, LEAVITT, NEBR.

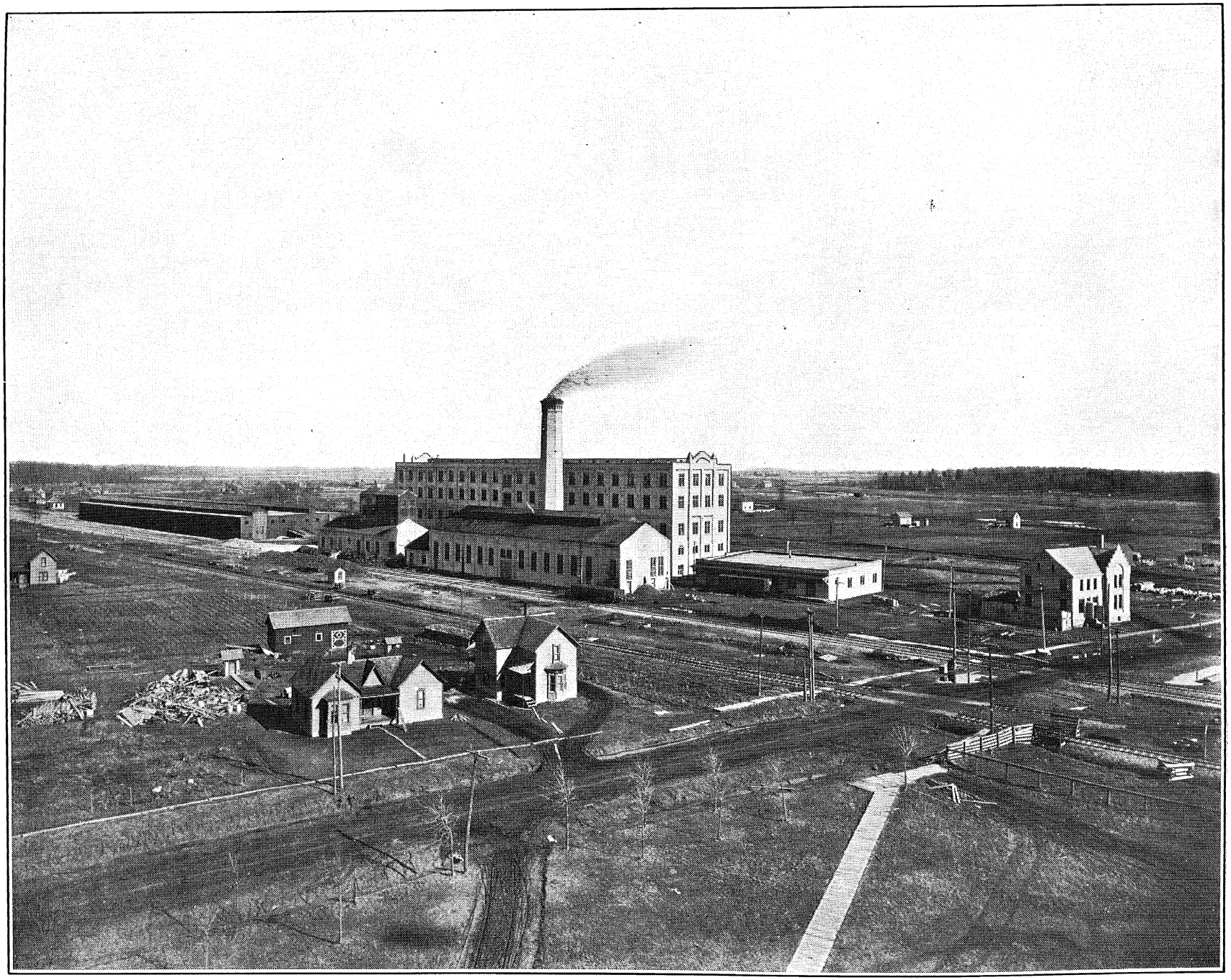


FIG. 4.—ALMA SUGAR COMPANY'S FACTORY, ALMA, MICH.

TABLE 10.—BEET SUGAR MANUFACTURED ON THE CONTINENT OF EUROPE AND IN THE UNITED STATES FOR THE YEARS 1897–98 TO 1899–1900.

[From Licht's Monthly Circular.]

	1899–1900. Tons of 2,240 pounds.	1898–99. Tons of 2,240 pounds.	1897–98. Tons of 2,240 pounds.
Germany	1,798,631	1,721,718	1,852,857
Austria	1,108,007	1,051,290	831,667
France	977,850	830,132	821,235
Russia	910,000	776,066	738,715
Belgium	304,000	244,017	265,397
Holland	171,029	149,763	125,658
Other countries	253,929	209,115	196,245
Total for Europe	5,523,446	4,982,101	4,831,774
United States	[1]71,427	[2]82,471	[2]40,399

[1] In tons of 2,240 pounds, deducting raw sugar carried over to 1900.
[2] Willett & Gray's Weekly Statistical Sugar Trade Journal, in tons of 2,240 pounds.

Historical.[1]—Until 1879 the history of the American beet sugar industry is a record of a series of failures.

The first experiments were made in 1830. There is no record of the quantity of sugar manufactured.

The history of the next experiments is also brief. David Lee Child in 1838–39 conducted small works at Northampton, Mass., and made 1,300 pounds of sugar, then discontinued the manufacture.

There is no record of further attempts until 1863, and from that time until 1876 a number of failures occurred in California, Illinois, and Wisconsin.

The first factory in California was erected in 1870, at Alvarado, the site of the first successful factory in the United States.

These works were operated until 1873, when it was proposed to remove them to another location. A new company was organized, which purchased the Alvarado machinery and removed it to Soquel, Santa Cruz county. E. H. Dyer, a stockholder of the Alvarado company, purchased the buildings, and in the face of many difficulties organized a company and installed new machinery. After a short time this company was reincorporated with larger capital, and operated the works until 1889 with varying success. The operations were hampered by imperfect and antiquated machinery, and these conditions, combined with lower prices of sugar, compelled another reorganization. In 1899 the property passed into the hands of the Alameda Sugar Company under the management of E. C. Burr, an experienced sugar refiner, who has rebuilt the factory and continued the manufacture with marked success.

The factory at Soquel, Cal., was in operation in 1879 and reported in the Tenth Census. It was operated at a loss for several years, and was abandoned about 1880.

The history of the manufacture at Alvarado is of great interest, since the success of these works, and the practical demonstration of the fact that suitable beets could be grown, led to the establishment of other factories, and were undoubtedly important factors in the development of the beet-sugar industry.

In 1879, 4 factories were in operation, 2 in California, 1 in Maine, and 1 in Delaware. The statistics of these factories, as published in the Tenth Census, are shown in Table 11.

TABLE 11.—STATISTICS OF BEET-SUGAR FACTORIES IN 1879, BY STATES, CENSUS OF 1880.[1]

STATES.	Number of establishments.	Capital.	WAGE-EARNERS.		Cost of materials used.	Value of products.
			Average number.[2]	Total wages.		
United States	4	$365,000	350	$62,271	$186,128	$282,572
California	2	215,000	150	39,131	104,724	162,988
Delaware	1	100,000	50	3,140	6,404	8,584
Maine	1	50,000	150	20,000	75,000	111,000

[1] Data from Tenth Census, Manufactures, pp. 94, 101, and 127.
[2] Men, 16 years and over.

Of these factories, 3 apparently yielded a small profit to their owners, but the history of the industry shows that, except 1 factory in California, at Alvarado, all were failures. The Alvarado factory, in fact, would possibly have followed the fate of the others, on account of its small capacity and antiquated machinery, had not additional capital been obtained. As already stated, the Alvarado Company was reorganized in 1889 upon a good financial basis and is still a prosperous establishment.

The favorable results obtained in the factory at Alvarado and the building of a factory at Watsonville, Cal., by Claus Spreckels, gave a new impetus to the sugar industry. Since then 35 factories have been built, or are building, in 11 states and 1 territory.

The Oxnard Brothers have been active in the development of the beet-sugar industry, and through their influence several large factories have been constructed.

In 1885 the factory at Alvarado was equipped with machinery of sufficient capacity to work approximately 125 tons of beets per day. The present Alvarado factory, owned by the Alameda Sugar Company, and equipped with modern American machinery, is shown in figure 1.

Beet sugar was not reported separately in the census of 1890, as only 2 factories were in operation. These factories were both located in California, and are still operated upon a largely increased scale. One of these factories a few years ago manufactured nearly 20,000 tons of sugar in a single season.

The quantity of beet sugar manufactured in 1889 was not separately tabulated in the report of the Eleventh Census. The quantity reported by the factories to the California state board of agriculture was 2,457 tons of

[1] Compiled largely from reports of William McMurtrie [In U. S. Dept. of Agriculture, Special Report No. 28 (1880), Appendix B] and H. W. Wiley [In U. S. Dept. of Agriculture, Division of Chemistry, Bulletin No. 27 (1890)].

[2] From U. S. Dept. of Agriculture, Division of Chemistry, Bulletin No. 5 (1885).

2,000 pounds, a large part of which was raw sugar. The total value of the product probably did not exceed $275,000. The average price paid for sugar beets was approximately $5 per ton. The total output of beet sugar in 1889 was less than 2 per cent of the total cane and beet sugar of domestic manufacture.

In 1897 the number of factories had increased to 9, with a total of 45,246 short tons[1] of sugar manufactured, or approximately 12 per cent of the total cane and beet sugar of domestic manufacture.

In 1899, as shown by the census statistics in this report, the number of factories operated was 30, with an output of 79,998 short tons of sugar, excluding 1,731 short tons of raw sugar melted in 1900, equivalent to the quantity melted in 1899 from the product of 1898. The total quantity of cane and beet sugar of domestic manufacture, as reported in Willett & Gray's Circular in 1899, was 229,537 short tons, showing that the production of beet sugar was then approximately 35 per cent of the total sugar produced in the country from sugar cane and beets.

The cane crop of 1899 was fully 100,000 tons below the average, but the beet crop was not over 50 per cent of what would reasonably be expected from the acreage seeded, hence the comparison is a just one.

The American beet-sugar factories now have a nominal daily capacity of 22,310 short tons of beets, and, when fully supplied with the raw material, should easily manufacture 240,000 short tons of sugar per annum.

From this brief historical sketch it is apparent that the period for which the statistics were gathered by the Census Office was one of the greatest activity in our beet-sugar industry. This fact has largely influenced the writer in devoting to the details of advancement more space than a strictly statistical report would require.

It should be stated that this period of great activity began in 1896, since which time 35 factories have been built, including 6 new ones for the crop of 1900. Of these 35 factories, 2 have failed. One, located at Menominee Falls, Wis., was not completed in time for the crop, and tests of machinery showed it to be practically a failure. This factory has never been operated and is not included in the statistics in this report. The second failure was that of the factory at Rome, N. Y. This factory was operated during three seasons, but was of small capacity and capital, and was not prepared to meet the sharp competition of other factories in the purchase of beets.

Federal and State Aid.—The bounty paid under the provisions of the tariff act of 1890 proved a powerful stimulus to investments in beet-sugar manufacture. Under this act domestic producers were paid a direct bounty for each pound of beet sugar manufactured. Since the repeal of this act, a protective tariff has favored the domestic manufacture of beet sugar.

Congress has for several years made appropriations to enable the Department of Agriculture to conduct investigations relative to the industry, and has also made provision for admitting beet-sugar machinery of foreign manufacture free of duty.

The Secretary of Agriculture has vigorously prosecuted the investigations intrusted to his Department. Printed information and beet seeds have been liberally distributed among farmers, and prospective investors have been accorded by the Department every facility to aid them in deciding upon locations for factories. The present Secretary, Hon. James Wilson, has been especially active in his efforts in behalf of the industry, and has done much toward the definition of those areas best suited to beet culture.

Several states have extended aid in the form of direct bounties, and have expended large sums for this purpose. The experience of the past few years as regards bounties has not always, however, been such as to encourage investments. Several state legislatures have repealed the bounty laws passed by their predecessors, and have even refused the payment of bounty already earned. The supreme court of Michigan has declared the bounty act of that state unconstitutional.

Local aid has been extended in a number of instances in the form of factory sites and exemption from taxation for a term of years.

Progress in Machinery and Methods.—The greatest advances in the past decade, in machinery, have been in the line of improvements rather than of new inventions.

There has been a marked improvement in labor-saving machinery, but perhaps the most notable advances have been in the convenient distribution of machinery and in the use of special devices in the transportation and handling of the raw materials, products, and by-products.

The climatic and labor conditions which obtain in localities in the United States suitable for the cultivation of the sugar beet and for the manufacture of beet sugar, have resulted in the development of mechanical devices which are used but little abroad. A person familiar with European machinery and factory construction, on inspecting the better class of establishments embodying American ideas and American construction, will at once notice the simplicity of arrangement and the graceful yet substantial design of the machinery.

Since the beet-sugar industry originated in Europe, and has there attained its greatest development, it is natural that we should have derived our processes of manufacture and the designs of much of our machinery from European sources.

Our builders have, in many instances, improved upon the foreign construction and have produced machinery

[1] U. S. Dept. of Agriculture. Special Report on the Beet Sugar Industry in the United States. (1898.) p. 160.

better adapted to American labor and climatic conditions.

Owing to the close study of foreign methods by our American builders and manufacturers, and to the considerable number of factory employees of foreign birth, it is impracticable in this review to confine these remarks to progress in machinery designed and built by Americans; frequently the suggestions leading to improvements have come directly or indirectly from abroad. Only those processes in use in this country will be mentioned.

Transportation, Unloading, and Storage of Beets.—The broad, level valleys of California permit the transportation of large loads of sugar beets in farm wagons. Loads exceeding 10 tons of beets have frequently been drawn to the factories in farm wagons of special construction. Inquiry in California indicates that the average load is from 7 to 8 tons of beets. The average in the beet districts of other states is probably less than 2, and doubtless in frequent cases does not exceed 1 ton per load. The economy of labor in the transportation of beets in California is evident from these figures.

The labor employed in hauling a load of 8 tons is no greater than for a load of 1 ton, and, by the use of mechanical devices for unloading, the actual cost for labor of delivering 8 tons of beets upon the cars or in the bins is little greater than for the delivery of a single ton. It should be noted, however, that the conditions in California are quite different from those of other beet sugar producing states.

The dry weather that usually prevails there during the greater part of the manufacturing season contributes to the delivery of roots with but little adhering soil. This condition is favorable to the use of mechanical dumping devices that can not be used to advantage in many other sections of the country.

A dumping device much used in California is usually termed the "net method." A net is stretched over the bed of the wagon and the beets are loaded upon it. The load is drawn alongside the car or bin, to which one edge of the net is then attached; the entire load is now discharged at one time by drawing on the opposite edge of the net by means of horses or a motor. In some instances the net and contents are lifted bodily by a traveling crane and the load deposited where desired in the bin.

A patented apparatus in use at a western factory consists essentially of a counterpoised tilting table, upon which the loaded wagon of beets is clamped, and by a simple manipulation its contents are dumped into the bin.

A tilting table is used at certain factories in discharging beets from railway cars. One of these factories has a capacity for dumping three cars, and another for dumping five cars at a time. The tables are tilted by hydraulic power and the beets fall directly into the sluices and are flushed into the factory.

The California factories have a very large receiving capacity. One of them can receive 1,000 tons of beets per day, by wagon alone, if necessary. Outside of California, mechanical devices for unloading beets are little used.

Many years ago certain French factories began the use of pipe lines in the transfer of beet juice from auxiliary or rasping stations to the central factory. This method is still used in Europe at several factories, but is not widely employed.

The exceptionally favorable conditions for beet production in Utah have led the Utah Sugar Company to increase its manufacture by means of outlying stations, according to the French system, devised by Linard. The Utah Sugar Company operated one auxiliary plant last year, and is equipping a second for the present season's work. These auxiliary plants have a combined capacity of from 700 to 800 tons of beets per day. A third auxiliary plant is now being built by this company for the crop of 1901–1902. The juice receives a part of its requirement of lime, and is then pumped approximately 20 miles through 5-inch pipe lines to the central factory. European experience has amply demonstrated that with proper precautions no loss of sugar need be feared in the use of pipe lines.

The construction of beet bins and sluices has been materially improved. The earlier bins were more or less experimental and of somewhat temporary construction. The modern factories now have substantial, well ventilated bins. In some instances the sluices are built of steel, which provides a very strong and convenient construction. In general, however, cement concrete is employed.

In those states where intense cold weather prevails during the greater part of the manufacturing season, the beet bins are constructed rather with a view to protecting the roots from thawing than for protection from frost. The experience of the American factories appears to have demonstrated that little loss of sugar is to be feared from the beets being frozen, but that, once frozen, every effort must be made to prevent thawing prior to manufacturing operations. In general, the bins are built of wood and wholly above ground. In cold climates, the bins in which beets are to be stored but a few days are often left open at the sides, and in some instances are not even roofed.

The American methods of constructing beet bins are much simpler than those employed in Europe, where these necessary adjuncts frequently involve a large outlay of capital. It is undoubtedly true that our abundant supplies of lumber at moderate cost have had their influence on the design and construction of the bins.

Factory buildings.—The advance in the methods of constructing factory buildings is especially noticeable. In modern American factories heavy brick walls, with roof and floors of wood, are no longer seen. Light walls, steel posts and beams, and concrete floors are the

rule. The machinery is entirely supported upon beams carried by posts, the walls serving only for protection from the weather. The absence of the heavy partition walls so common in European factories is noticeable.

In laying the floors, expanded metal, such as is frequently used instead of wooden lathing, is laid from beam to beam upon a temporary staging of lumber. The concrete, to a thickness of approximately 3 inches, is applied directly upon the metal. A floor of this class is not only fireproof, but is of great advantage in the event of leakage, or tanks overflowing.

The modern sugar-factory building is fireproof, and as there is no inflammable material stored in it, the formerly heavy item of fire insurance is practically eliminated.

A very hopeful sign for the future of the American beet-sugar industry is found in the evident belief on the part of the projectors of many of the factories that the industry has long since passed the experimental stage. This is evidenced by the large, substantial buildings and the arrangement of machinery so as to admit of readily enlarging the plant. With few exceptions, the factories built within the past ten years have been designed with a view to doubling their capacity, 350 or 500 tons of beets having been considered an economical starting point. In figure 2 a factory is shown which was originally designed for a capacity of 1,000 tons, with space for doubling. It has since been enlarged to 2,000 tons capacity. In the interior view, figure 3, the spaces provided for additional machinery may be noted in a similar, but smaller, factory by the same builders. Two of the old factories have been repeatedly enlarged, 2 factories have doubled, and 1 has nearly quadrupled its capacity. The beet-sugar building of to-day is lofty, and is prepared for almost any emergency that may arise in the development of new processes and new machinery.

Experience has demonstrated that the greatest problems in the American beet-sugar industry are to be found in the field rather than in the factory. It should not be assumed from this statement that suitable beets are difficult to grow in satisfactory quantities; the problem is to convince the farmer that with persistent effort and experience he will find sugar beets a surer and more profitable crop than many others.

Of the factories built in this country within the past few years, the most successful, mechanically considered, have been designed and built by Americans or by sugar engineers of foreign birth who have been long identified with the sugar industry in the United States.

In some instances, the experience of our manufacturers with foreign-built machinery has not been satisfactory. The American engineer has great aptitude in designing and placing machinery with a view to economy and to quality of product, and the American manufacturer demands that his factory shall include such conditions. He can unquestionably obtain these conditions at home and avoid the expensive experiences of certain factories.

This is not intended to be a sweeping condemnation of foreign-built factories, since we know there are builders in Europe as competent as any in the world. The writer's wish is simply to emphasize the fact that satisfactory machinery can be obtained in this country. The time has long since passed when it was necessary to go to Europe for sugar engineers or to find shops capable of designing or building beet-sugar machinery. There is not a single item of sugar machinery that our shops can not build, of as effective design as the most approved from foreign sources.

The advance in the beet-sugar industry in the past ten years has been so great that we now have several large shops prepared to execute orders for complete plants. The illustrations, figures 2 and 4, of American-built and equipped factories, are indicative of the great progress made in the beet-sugar industry.

Automatic scales of German manufacture are employed in many factories in weighing the beets. The scales provide a valuable check on the weight of raw material entering the factory. Automatic scales of American manufacture are also being introduced, to some extent, in weighing the finished product.

There has been but little improvement during the past decade in the design of the diffusion battery. Some advance may be noted in the construction of details, such as latches, etc., and heating by means of steam injectors appears to be growing in favor. The long desired invention of a satisfactory continuous process of diffusion seems to be as far from attainment as ever.

For the removal of the pulp various devices are used. The usual method is to discharge the by-product from the elevators into dump cars, to be carried to the silos or storage pile. Some factories, finding no market for the pulp during the past season, flushed it from the building with water, in one instance a distance of several miles, to the ocean. Aerial transportation of the pulp in cars suspended from a cable is practiced at several factories.

The systematic storage and care of pulp, so noticeable in Europe, is almost entirely lacking in this country. So far as the writer could learn, the return of a certain quantity of pulp to the beet grower is stipulated in the contracts of only one company. This is a very popular form of contract abroad, and in many districts it is doubtful whether beets could be obtained without it.

Hon. James Wilson, Secretary of Agriculture, who has been consistently encouraging the beet-sugar industry through his field agents and the publications of the Department, has wisely taken the ground that the most profitable expansion of the industry demands the utilization of the pulp in cattle feeding. He looks for the greatest advance to be made in those sections

where the farmer can be made to appreciate the feeding value of this by-product.

In Europe kilns have been constructed and used to some extent for desiccating pulp. Kilns of American design are being constructed at several factories. These kilns will make it possible to ship dry pulp, over long distances if necessary, to points where it will find a market. The dried material contains about 10 per cent of water, and may be used as an absorbent for molasses or other liquid food. It is claimed that a ready market awaits this product both at home and abroad.

The carbonatation apparatus has been improved. A few factories employ modern tanks 18 to 20 feet in depth. The use of cottonseed oil, which is displacing tallow in several factories for keeping down the foam in the carbonatation process, results in a considerable economy. Only one factory is equipped with the process of continuous carbonatation. Where all the factory conditions conduce to regularity of work, this process would probably prove a saving of labor.

Filtration plays an important part in the modern sugar factory. The juice and liquors are repeatedly filtered at the various stages of the manufacture. This demand for filtration led first to the invention of filter pockets, of which the formerly well-known Puvrez filter and filter pockets were forerunners, and from which the present mechanical filters were developed. The improvement in mechanical filtration has been limited to details of joints and fastenings.

Sand filters are being erected in one factory. A filter of the Denek type, but provided with a metal filtering surface, has been successfully employed as a depulper by the builder of two of the new factories. Two small filters of this type are sufficient for the removal of the fine pulp from the diffusion juice of 500 tons of beets a day.

A few years ago there was a tendency to increase the size of the filter presses, and a number of the so-called "monster" presses were built. These presses have apparently not proved as desirable in practice as was anticipated, and now few presses are built having a filtering area even as large as 1,000 square feet.

The improvement in the methods of removing the filter-press or lime-cake from the factory has been marked. This has been a very troublesome by-product with which to deal, especially in cold climates. The old method of discharging the lime-cake into cars is disappearing.

In a number of sugar houses, located where the climate is mild, the lime-cake is discharged into a conveyor or drag, and is mechanically removed from the building. Many factories in Nebraska and the states farther east discharge the lime-cake into a mixer, where it is beaten to a batter with waste water which is constantly flowing into the mixer. The thin batter overflows into a trough and is led to a settling pond. In a more recent construction the lime-cake batter is forced by a centrifugal pump through a 4-inch pipe, and deposited in the pond.

The settling pond is arranged to give the water a long travel with a slow current. By the time the water has reached the outlet it is reasonably clear. It is claimed that this water may be run into the rivers without perceptibly polluting them. One of the factories uses this method for the disposal of all its waste, including that from the Steffen saccharate process. In a few months after the close of the manufacturing season, the lime deposit dries, and may be removed from the bed of the pond with road scrapers.

With few exceptions the American factories manufacture only white granulated sugar of a very excellent quality. This sugar is manufactured without the use of boneblack, the bleaching of the juice being accomplished by sulphurous acid.

There has been no marked improvement in the apparatus for sulphuring the juice; the French and German types of sulphur stoves are used. In many factories the juice is treated with sulphurous acid in tanks somewhat similar to those employed in the carbonatation. In other factories a very rational continuous apparatus, built of wood, is used. This apparatus, when once regulated, is easily controlled without detailing a laborer specially for the purpose.

The Welner-Jelinck type and the ordinary vertical tube or "standard" multiple-effects are used for evaporating the juice by all but one of the factories. This latter factory uses an automatic multiple-effect, a recent American invention of the "film" type, but in which a copious circulation of the solution over the heating surfaces is maintained by mechanical means. This apparatus is widely used in the manufacture of cane sugar and in sugar refineries, but has not yet had an extended trial in the beet-sugar industry.

Apparatus of the Welner-Jelinck type, with horizontal tubes of small diameter, is used by the majority of the factories. One factory is equipped with a quintuple-effect evaporator, and all the others have quadruple-effects.

The vacuum-pans employed are of the usual form, and show no material progress, either in shape or distribution of the heating surface, over those employed ten years ago.

The brasmoscope, a foreign invention, is used to some extent in controlling the boiling of the low products. This is an instrument which is attached to the vacuum-pan, and enables a rapid estimate of the density of the massecuite to be made from temperature and pressure indications. By the use of this apparatus massecuites may be concentrated to a practically uniform density.

Probably the most important advance made in beet-sugar methods in the past few years, as illustrated in American factories, is the process of "crystallization in

movement." This process was invented in Germany. It consists in agitating the massecuite during the crystallization, and is usually applied in this country to the low products only. The apparatus consists of a large wrought-iron cylinder, fitted with a water jacket and agitators similar to those of a massecuite mixer. The average capacity of the apparatus is appproximately 35 tons of massecuite. As the name of the process implies, the massecuite is agitated and the crystals are kept in motion during the crystallization, thus constantly bringing their surfaces into contact with fresh portions of the sugar solution, and promoting a rapid increase in size. The massecuite is systematically cooled during the progress of the crystallization, thus forcing the sugar out of solution. A small centrifugal is employed in many factories to determine the most economical point at which to discontinue the operation.

This process has facilitated the management of the low products and reduced the time required for the crystallization to four or five days, instead of the several weeks formerly required. The crystallization movement has proven an economy of labor. It also permits systematic control of the crystallization of the sugar.

Vacuum crystallizers are being installed in a factory now building.

The most approved centrifugals for drying sugar are of American invention. American types of centrifugals are used wherever sugar is manufactured.

The only recent improvement in these machines worthy of special note is the water-driven centrifugal. A water motor is coupled directly to the spindle of the machine, and does away with belting and shafting. This device not only promotes the safety of the workmen, but renders each machine entirely independent of the others, and obviates the delays incident to belts and pulleys. A factory now building will be supplied with water-driven centrifugals.

Molasses Processes.—But two molasses processes are now in use in American factories, namely, the Steffen separation process and the osmose process. The former is a saccharate process, employing quicklime in an impalpable powder as a precipitant of the sugar; the latter, as its name implies, depends upon dialysis. Both processes are of foreign origin and have been in use many years.

A factory built for the crop of 1900 by E. H. Dyer & Co., at Fremont, Ohio, is equipped with a lead saccharate process, a German invention. In this process the molasses is mixed with caustic potash and lead carbonate. The nascent oxide of lead formed combines with the sugar, forming a saccharate of lead, which is collected and washed in a filter-press, then suspended in water and decomposed with carbonic acid; pure sugar is thus liberated, and the carbonate of lead precipitated is used in the treatment of a subsequent lot of molasses. The mother liquor which flows from the filter-presses is treated for the recovery of potash, soda, and other by-products.

Should this process prove satisfactory in the practical test of manufacture, it will enable the factory to utilize every by-product of the beet in the manufacture of readily salable material.

The development of molasses processes is well shown in Table 12, which presents the statistics of the German sugar industry, compiled by Ernst Glanz. Data prior to 1886 are omitted.

TABLE 12.—QUANTITIES OF MOLASSES TREATED IN GERMANY BY VARIOUS PROCESSES FOR THE EXTRACTION OF THE SUGAR.

CROP.	Osmose process.	Elution process.	Steffen's separation process.	Strontium process.	All other processes.	Total quantity of molasses treated.
	Tons.	*Tons.*	*Tons.*	*Tons.*	*Tons.*	*Tons.*
1886–87	7,315	93,589	35,537	104,104	14,400	254,945
1887–88	92,460	97,115	43,878	117,549	15,033	366,035
1888–89	51,598	73,839	34,762	121,356	11,022	292,577
1889–90	46,579	70,345	40,273	118,489	6,905	282,591
1890–91	73,209	79,735	50,980	121,530	10,048	335,502
1891–92	57,496	60,332	50,725	124,420	5,132	298,105
1892–93	25,614	44,897	49,336	127,130	4,628	251,605
1893–94	19,462	22,842	28,938	157,628	2,806	231,676
1894–95	15,883	28,111	34,293	184,431	.....	262,718
1895–96	24,601	24,019	31,425	214,632	.....	294,677
1896–97	10,966	21,135	32,403	255,830	2,041	322,375
1897–98	7,297	10,240	27,230	260,225	1,815	306,807
1898–99	4,342	8,598	20,616	249,307	2,265	280,128

An examination of these German statistics[1] indicates that the strontium process leads all others, both in the amount of sugar recovered and in the rate of increase in its application. In 1890 approximately 36 per cent of the sugar recovered by all molasses processes was obtained by the use of strontia. The per cent of increase has been rapid, and in 1899 nearly 90 per cent of the sugar recovered was obtained by this process.

The osmose and elution processes have rapidly decreased in the extent of their application, until at the present time they are little used, as is indicated by the statistical table.

The yield of sugar by the separation process (Steffen) reached its maximum in 1890. The output of sugar by this process decreased 35 per cent from 1890 to 1892, and has reached the production of 1892 but once since. The sugar yielded by this process is more than double the quantity by all other processes except the strontium. There is little probability of the extensive application of the strontium process in the United States, unless large deposits of suitable strontium-bearing minerals be discovered.

It is noticeable in these German statistics that the quantity of molasses treated by the various saccharate and other processes has varied within narrow limits during the past fifteen years. The quantity consumed in alcohol manufacture has varied more; but in fifteen years it has not exceeded 105,000 tons yearly, and in 1898 was only 51,666 tons, a figure approaching the average of several years.

The quantity exported has ranged as high as 111,000

[1] "Zeitschrift des Vereins für die Rübenzucker-Industrie des Deutschen Reichs." Supplement to the number for March, 1900. Translated and weights converted into tons of 2,000 pounds.

tons, while in 1898 it was only 7,234 tons. The quantity of molasses not accounted for in molasses processes, distillation, and export in 1898 reached the enormous quantity of 138,816 tons. The disposal of this molasses, with profit to the manufacturer, is a great problem. Some of it is fed to cattle, but the amount so used is only a small part of the surplus of this by-product. These are interesting figures, in view of the large production of molasses in our factories and the enormous losses incurred through the necessity of running much of the molasses product into the rivers. These figures are of value also in exhibiting the relative extent of the application of the various molasses processes.

Marked improvements have been made in laboratory methods and polariscopic instruments. The most progressive factories are using direct methods of analysis of the beets in control work and in fixing the purchase price of the beets. A few factories still adhere to the indirect method of analysis of beets, i. e., analysis of the juice, and conversion to terms of the weight of the beet by the use of an arbitrary factor. It is a fact well known to analysts that the proportion of juice in the beets is a very variable quantity, and that the use of an arbitrary factor introduces errors into the estimate of the sugar content. For this reason certain establishments have been in the habit of varying the factor from time to time, as in their judgment, based on tests, the beets varied in juice content. This has led to dissatisfaction on the part of the farmers. These factories, if they continue to purchase beets on test, will be compelled to keep pace with improvements in analytical methods, and purchase on the basis of the percentage of sugar in the beet as determined directly and without the arbitrary assumption of factors for conversion.

The direct methods of beet analysis have been so greatly simplified in the past few years that it is now possible to make a large number of tests with great accuracy and little labor. A notable improvement in polariscopes, conducive to accuracy and ease of manipulation, is in the addition of a pair of prisms which give a triple instead of a double field. This device enables a prompt and accurate adjustment to the neutral point to be made. Other improvements, aside from accuracy of adjustments of the various parts of the instrument, relate to the better protection of the optical parts from climatic influences, dust, and insects.

The improvements in mills and rasps for pulping the beet for analytical purposes have been numerous, as have also those in the other laboratory accessories. All the American factories have well-equipped laboratories and are more or less under chemical control.

Summary and Conclusion.—The statistics of the beet-sugar industry show that, after many years of manufacture on a small scale, it has assumed large proportions, and in the census year more than one-third of the domestic sugar product was obtained from the beet. This quantity of sugar, 70 per cent of which was suitable for immediate consumption, was produced in a year of extremely unfavorable agricultural conditions in the beet districts. The yield of beets per acre was less than half that of an average season. The factories could readily manufacture more than two and one-half times the quantity of sugar produced, if supplied with sufficient raw material.

The progress of the industry can not be measured by the returns of previous censuses, since beet sugar has been separately reported but once, by the census of 1880, and at that time the total capital invested in 4 establishments would not equip a modern factory of average capacity.

The schedules show that but 1 factory obtained sufficient beets, and that many were operated but a small fraction of their capacity. The average quantity of beets worked per factory was 26,489 short tons, and the average nominal capacity of the factories, based upon only 100 days' work, is more than 60,000 tons. The average length of the working season in the various states is not known, but for the United States it is probably nearer 140 days than 100 days. Notwithstanding the very adverse agricultural conditions which resulted in the small supply of raw material, the value of the products was larger than the expenditures. A number of factories earned a fair return on their investments, others paid expenses, and several lost heavily. The statistics demonstrate that beet-sugar manufacture is a commercial success in the United States.

RICE, CLEANING AND POLISHING.

RICE, CLEANING AND POLISHING.

By DANIEL C. ROPER, *Expert Special Agent.*

Reports have been received from 80 establishments engaged in rice, cleaning and polishing, in the United States, during the census year ending May 31, 1900. These establishments were located in 12 states, but it is impossible to publish separate totals for 6 of these states without disclosing the operations of individual establishments. The statistics of these 6 states are therefore grouped under the head of "all other states," and include establishments distributed as follows: California, 1; Mississippi, 2; New York, 2; Oregon, 1; Texas, 1; and Washington, 2. The statistics for Hawaii are not included in the general tables of this report, but are given separately in Table 5.

Table 1 is a comparative summary of the statistics of rice, cleaning and polishing, as returned at the censuses of 1880, 1890, and 1900.

Rice, cleaning and polishing, being of comparatively recent commercial development, was not reported at any census prior to 1880. Since that time the growth of this industry has been noteworthy, the number of establishments having increased from 22 in 1880 to 80 in 1900, a gain of 263.6 per cent; the capital from $562,200 in 1880 to $2,601,352 in 1900, a gain of 362.7 per cent; and the value of products from $3,133,324 in 1880 to $8,723,726 in 1900, a gain of 178.4 per cent.

TABLE 1.—COMPARATIVE SUMMARY OF RICE, CLEANING AND POLISHING, IN THE UNITED STATES, 1880 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.			PER CENT OF INCREASE.	
	1900	1890	1880	1890 to 1900	1880 to 1890
Number of establishments	80	32	22	150.0	45.5
Capital	$2,601,352	$2,073,884	$562,200	25.4	268.9
Salaried employees	169	96	(1)	76.0	.....
Salaries	$182,033	$96,160	(1)	89.3	.....
Wage earners, average number	651	647	516	0.6	25.4
Total wages	$265,585	$223,433	$110,467	18.9	102.3
Men, 16 years and over	639	630	876	1.4	67.6
Wages	$262,042	$221,360	(1)	18.4	.....
Women, 16 years and over	(2)	9	94	.....	[3]90.4
Wages	(2)	$1,323	(1)	.....	.....
Children	12	8	46	50.0	[3]82.6
Wages	$3,543	$750	(1)	372.4	.....
Miscellaneous expenses	$230,208	$147,992	(4)	55.6	.....
Cost of materials used	$7,575,522	$5,601,206	$2,666,497	35.2	110.1
Value of products	$8,723,726	$6,693,196	$3,133,824	30.3	113.6

[1] Not separately reported. [2] None. [3] Decrease. [4] Not reported.

Table 2 presents, by states, the quantity and cost of rough rice milled, the quantity and value of products, the per cent of total rice milled by each state, and the average quantity of rice milled per establishment.

TABLE 2.—QUANTITY AND COST OF ROUGH RICE MILLED, QUANTITY AND VALUE OF PRODUCTS, PER CENT OF TOTAL RICE MILLED BY EACH STATE, AND AVERAGE QUANTITY OF RICE MILLED PER ESTABLISHMENT, BY STATES: 1900.

STATES.	Number of establishments.	ROUGH RICE MILLED.		PRODUCTS.			Per cent of total rice milled.	Average quantity of rice milled per establishment (pounds).
		Pounds.	Cost.	Total value.	Clean rice (pounds).	By-products[1] (pounds).		
United States	80	398,602,018	$7,184,208	$8,723,726	243,031,200	155,570,818	100.0	4,982,525
Alabama	4	193,500	3,435	4,816	116,660	76,840	[2]	48,375
Florida	4	575,640	8,850	13,995	350,466	225,174	0.1	143,910
Georgia	4	14,444,541	154,433	184,804	8,622,510	5,822,031	3.6	3,611,135
Louisiana	37	290,165,708	4,764,867	5,786,451	173,632,724	116,532,984	72.8	7,842,317
North Carolina	4	9,929,250	168,400	238,520	5,959,710	3,969,540	2.5	2,482,313
South Carolina	18	42,405,795	821,338	973,132	24,864,112	17,541,683	10.7	2,355,878
All other states[3]	9	40,887,584	1,262,885	1,572,008	29,485,018	11,402,566	10.3	4,543,065

[1] Includes hulls and waste.
[2] Less than one-tenth of 1 per cent.
[3] Includes establishments distributed as follows: California, 1; Mississippi, 2; New York, 2; Oregon, 1; Texas, 1; and Washington, 2.

The 80 establishments engaged in rice, cleaning and polishing in the United States during the census year, cleaned 398,602,018 pounds of rough rice, valued at $7,184,208. From this were obtained 243,031,200 pounds of clean rice, and 155,570,818 pounds of by-products. The total value of all products was $8,723,726. Included in the quantity of rice milled are 39,414,459 pounds of foreign rice, received principally from China and Japan, and handled by mills on the Pacific coast, in New York city, and in New Orleans. The products of

many rice mills do not reach commercial channels, and it is, therefore, impossible to itemize the value of products. The average consumption per establishment during the census year was 4,982,525 pounds, ranging from 48,375 pounds in Alabama to 7,842,317 in Louisiana. The Louisiana mills handled 72.8 per cent of the total quantity milled.

Table 3 presents the quantity of products and the per cent which each formed of the total product.

TABLE 3.—QUANTITY OF PRODUCTS AND THE PER CENT WHICH EACH FORMED OF THE TOTAL: 1900.

STATES.	Total pounds.	CLEAN RICE.		POLISH.		BRAN.		HULLS AND WASTE.	
		Pounds.	Per cent of total.	Pounds.	Per cent of total.	Pounds.	Per cent of total.	Pounds.	Per cent of total.
United States	398,602,018	243,031,200	61.0	15,134,648	3.8	69,265,012	17.3	71,171,158	17.9
Alabama	193,500	116,660	60.3	7,758	4.0	38,573	19.9	30,509	15.8
Florida	575,640	350,466	60.9	22,975	4.0	109,328	19.0	92,871	16.1
Georgia	14,444,541	8,622,510	59.7	435,528	3.0	2,604,964	18.0	2,781,539	19.3
Louisiana	290,165,708	173,632,724	59.8	11,491,319	4.0	50,243,288	17.3	54,798,377	18.9
North Carolina	9,929,250	5,959,710	60.0	368,010	3.7	1,934,730	19.5	1,666,800	16.8
South Carolina	42,405,795	24,864,112	58.6	1,648,211	3.9	8,640,421	20.4	7,253,051	17.1
All other states[1]	40,887,584	29,485,018	72.1	1,160,847	2.9	5,693,708	13.9	4,548,011	11.1

[1] Includes establishments distributed as follows: California, 1; Mississippi, 2; New York, 2; Oregon, 1; Texas, 1; and Washington, 2.

The by-products obtained in milling rice are polish (or flour), bran, and hulls. Polish is the fine dust taken from the grain in the final polishing process, bran is the product obtained from the grinding of the inner cuticle of the grain with the finer particles of hulls, and hulls are the outer husks of the grain. As shown in the above table, the component parts of the product of rice, cleaning and polishing, in the United States during the census year were: Clean rice, 61 per cent; polish, 3.8 per cent; bran, 17.3 per cent; and hulls and waste, 17.9 per cent. Thus, from a barrel (162 pounds) of rough rice is obtained an average of 99 pounds of clean rice, 6 pounds of polish, 28 pounds of bran, and 29 pounds of hulls and waste. Foreign rice is received in a partially cleaned condition and hence these ratios do not apply to it. Mills handling foreign rice show 74.9 per cent of clean rice, or 121 pounds per barrel of rough rice, and a very small percentage of waste. This accounts for the large percentage of clean rice shown for "all other states" in Table 3. "All other states" includes the states of New York, Washington, Oregon, and California, which mill foreign rice almost exclusively.

Both rice flour and bran are considered excellent feed for cattle and hogs, and are ground together by mills in Georgia and the Carolinas and sold for this purpose. Such a feed is valued at about $15 per ton. When sold separately the bran brings about $12 per ton and the flour $18. Owing to the large amount of starch in rice flour, it will not undergo fermentation with yeast, and hence can not be used alone in bread making, but mixed with wheat or rye flour it is used for this purpose. In Germany this product is used in making an imitation ivory, from which is manufactured doll heads and cheap jewelry. Starch, cement, paper, and other similar products are made from it. Hulls, which are a waste in most of the mills, are used by some of the larger ones as a fuel. Their recent use by the ice companies, canned goods factories, and crockery houses for packing purposes, is increasing the demand for them.

Table 4 presents, by decades, the quantity of clean rice produced in the United States from 1840 to 1900.

TABLE 4.—QUANTITY OF RICE GROWN IN THE UNITED STATES (IN POUNDS OF CLEAN RICE), BY DECADES, 1840 TO 1900.[1]

STATES.	1900	1890	1880	1870	1860	1850	1840
United States	250,280,227	123,590,994	110,131,373	73,635,021	187,167,032	215,313,497	80,811,422
Alabama	926,946	399,270	810,889	222,945	493,465	2,312,252	149,019
Arkansas	8,630	7,110	.....	73,021	16,831	63,179	5,454
California	.....	.....	.....	.....	2,140	.....	.....
Florida	2,254,492	1,011,805	1,294,677	401,687	223,704	1,075,090	481,420
Georgia	11,174,562	14,556,432	25,369,687	22,277,380	52,507,652	38,950,691	12,894,732
Illinois	.....	.....	.....	.....	.....	.....	460
Kentucky	.....	.....	.....	.....	.....	5,688	16,376
Louisiana	172,732,430	75,645,433	23,188,311	15,854,012	6,831,257	4,425,349	3,604,534
Michigan	.....	.....	.....	.....	716	.....	.....
Minnesota	.....	.....	.....	.....	3,286	.....	.....
Mississippi	739,222	676,746	1,718,951	374,627	809,082	2,719,856	777,196
Missouri	.....	.....	.....	.....	9,767	700	50
North Carolina	7,892,580	5,846,404	5,609,191	2,059,281	7,593,976	5,465,868	2,820,388
South Carolina	47,360,128	30,338,951	52,077,515	32,304,825	119,100,528	159,930,613	60,590,861
Tennessee	.....	.....	.....	3,899	40,372	258,854	7,977
Texas	7,186,863	108,423	62,152	63,844	26,031	88,203	.....
Virginia	4,374	360	.....	.....	8,225	17,154	2,956

[1] As reported to the division of agriculture, Census Office.

The production of rice in 1900 (growth of 1899), as reported to the division of agriculture, Twelfth Census, expressed in terms of clean rice, was 250,280,227 pounds. The quantity of foreign-grown rice milled in the United States during the census year was 39,414,459 pounds. By subtracting this foreign rice from the total mill consumption given in Table 2, 398,602,018 pounds, the quantity of rice of domestic growth milled is found to be 359,187,559 pounds. There were two establishments in Louisiana and one in Texas whose products were primarily flour and grist, but which reported having cleaned in connection therewith 18,251,112 pounds of rough rice from the crop of 1899. By adding this to the amount of domestic rice milled, the total quantity of rice of domestic growth milled in the United States during the census year is found to be 377,438,671 pounds. The quantity of clean rice obtained from this was 224,912,528 pounds. The excess in the quantity of rice grown over that milled, expressed in terms of clean rice, is 25,367,699 pounds, which represents the quantity of rice held by the farmers for seed, or cleaned by hand on the farm for domestic use, or milled in local gristmills and returned by them with all other unclassified products.

The acreage devoted to rice culture in the United States for the crop of 1899 was 351,344. The amount of seed required per acre varies from 114 to 135 pounds in the Carolinas and Georgia to from 50 to 80 pounds in Louisiana and Texas. The increase in acreage for the crop of 1899 was marked in all the states, but especially in Louisiana and Texas, where the acreage increased from 84,555 in 1889 to 210,396 in 1899. A small part of the seed used in this region came from Japan, but it is safe to assume that 30,000,000 pounds of domestic rough rice, equivalent to about 18,000,000 pounds of clean rice, was thus kept from the mills. The remaining difference of 7,367,699 pounds represents the quantity of rice cleaned by hand on the farms or milled and not separately reported by gristmills. In the upland rice-growing territory, where this product is grown only for domestic consumption, the quantity milled in connection with the gristmills was of such small importance that it was included in "all other products" in the reports of such establishments.

Table 5 is a summary of rice, cleaning and polishing in Hawaii during the census year.

TABLE 5.—SUMMARY FOR HAWAII, CROP OF 1899.

Number of establishments	41
Capital	$381,625
Salaried employees	18
Salaries	$12,100
Wage-earners, average number	173
Total wages	$49,124
Men, 16 years and over	171
Wages	$48,800
Children, under 16 years	2
Wages	$324
Miscellaneous expenses	$23,329
Cost of materials used	$481,925
Value of products, including custom work and repairing	$664,300
Pounds of rough rice milled	22,089,250
Average consumption of rough rice per establishment	538,762
Pounds of clean rice obtained	15,001,020
Production in pounds[1]	33,442,400
Acreage[1]	9,130
Average production per acre (pounds)	3,663

[1] As reported to division of agriculture, Twelfth Census.

The 41 establishments shown in the above table used 22,089,250 pounds of rough rice, and produced 15,001,020 pounds of clean rice, valued at $664,300. Of this amount 596,100 pounds, valued at $29,306, were imported, as shown in Table 8. The total production of the Hawaiian Islands was 33,442,400 pounds, expressed in terms of clean rice. The difference between this and the mill consumption is 18,441,380 pounds. It thus appears that less than one-half of the production was cleaned by the mills reporting. The remainder was either cleaned for domestic uses by primitive methods or held as rough rice for seed. The balance of trade in rice between the United States and the Hawaiian Islands is now in favor of this country, having become so within the past decade. The imports of rice from these islands decreased from 7,840,900 pounds in 1891 to 596,100 pounds in 1900, while the exports to them increased from nothing in 1891 to 6,619,188 pounds in 1900, as shown by Tables 10 and 11. The explanation of this is found both in the changed relationship between these countries and in the increased demand for rice in Hawaii, caused by the immigration in recent years of large numbers of Chinese and Japanese, who are very large consumers of rice. In Japan the per capita consumption of rice is 308.75 pounds yearly, while in the United States it is only 3.8 pounds.

Table 6 presents a comparison from 1890 to 1899 of the annual production of rice in the United States, exports and consumption of domestic rice, imports, exports, and net imports of foreign rice, total rice consumption, per cent of domestic product exported, per cent of consumption produced in the United States, and the per cent of consumption imported.

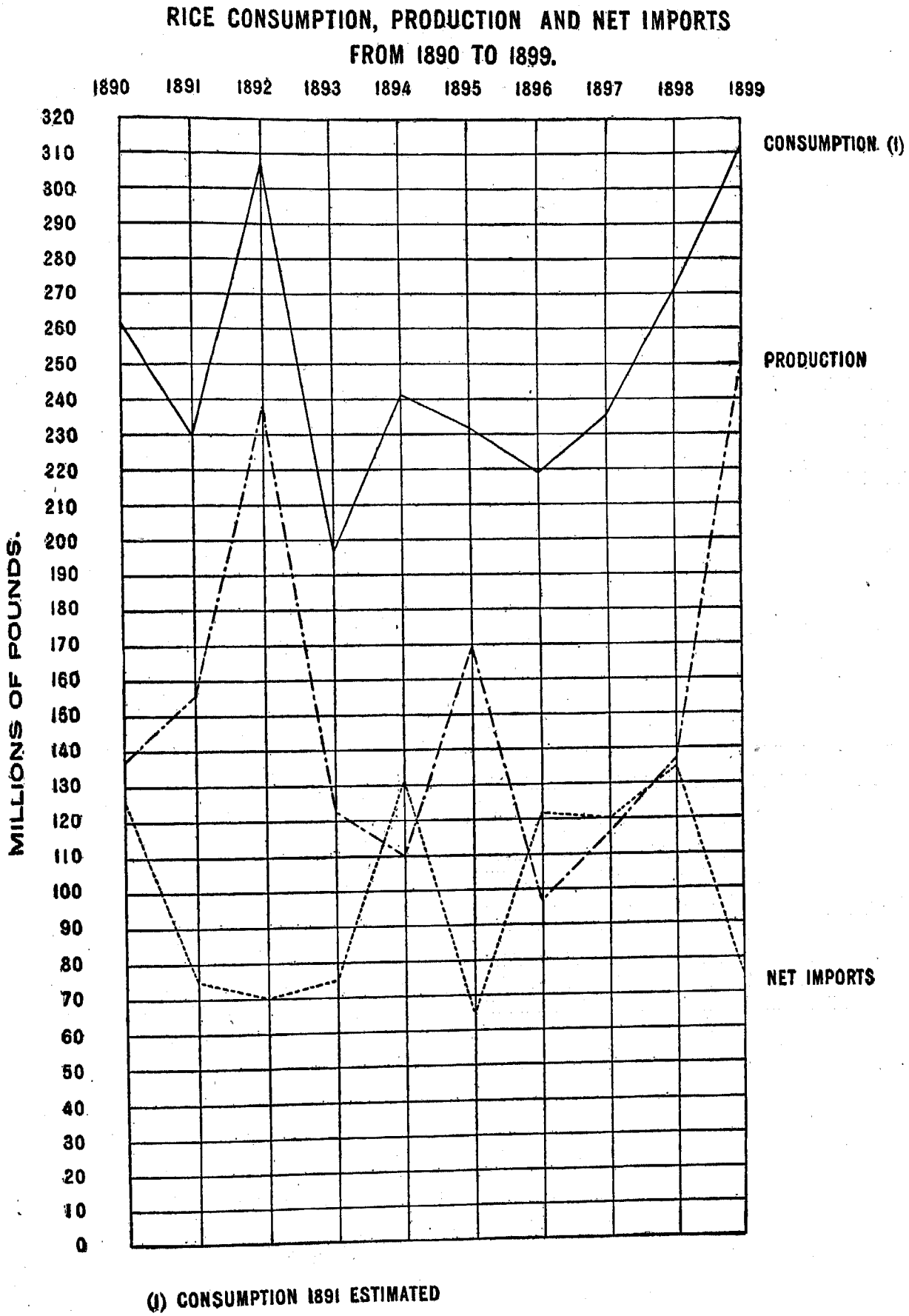
TABLE 6.—COMPARATIVE STATEMENT—PRODUCTION, EXPORTS, AND CONSUMPTION OF DOMESTIC RICE, IN POUNDS; IMPORTS, EXPORTS, AND NET IMPORTS OF FOREIGN RICE; TOTAL RICE CONSUMPTION; PER CENT OF DOMESTIC PRODUCT EXPORTED; PER CENT OF CONSUMPTION PRODUCED IN THE UNITED STATES; AND PER CENT OF CONSUMPTION IMPORTED: 1890 TO 1899.[1]

	1899	1898	1897	1896	1895	1894	1893	1892	1891	1890
Production[2]	250,280,227	136,990,720	116,301,760	96,886,400	168,665,440	109,820,800	122,865,160	237,546,900	155,665,600	186,800,000
Exports of domestic[3]	12,947,009	852,704	637,146	387,288	[4]1,346,876	124,296	763,425	756,992	(5)	540,620
Consumption of domestic	237,333,218	136,138,016	115,664,614	96,499,112	167,318,564	109,696,504	122,101,735	236,789,908	.....	186,259,380
Imports[3]	93,648,451	163,837,026	129,810,630	133,939,930	78,190,384	141,301,411	86,810,536	81,031,944	85,112,164	188,101,063
Exports of foreign[3]	18,267,687	19,114,698	10,305,694	11,607,634	13,619,466	10,271,357	11,877,253	10,870,572	10,591,923	8,119,574
Net imports	75,380,764	134,722,328	119,504,936	122,332,296	64,570,868	131,030,054	74,933,283	70,161,372	74,520,241	124,981,489
Total consumption	312,713,982	270,860,344	235,169,550	218,831,408	231,889,432	240,726,558	197,035,018	306,951,280	.....	261,243,869
Per cent of domestic product exported	5.2	0.6	0.5	0.4	0.8	0.1	0.6	0.3	.....	0.4
Per cent of consumption produced in the United States	75.9	50.3	49.2	44.1	72.2	45.6	62.0	77.1	.....	52.2
Per cent of consumption imported	24.1	49.7	50.8	55.9	27.8	54.4	38.0	22.9	.....	47.8

[1] The statistics of production cover the growth of the years indicated; the commercial statistics cover the year ending June 30, following.
[2] Statistics from 1891 to 1898, inclusive, compiled from statistics (Dan Talmage's Sons Co.), Bulletin No. 22, United States Department of Agriculture. For 1899, from reports to the division of agriculture, Twelfth Census.
[3] Statistical Abstract of the United States Treasury Department, 1900.
[4] 896,000 pounds damaged.
[5] Included in "rice bran, etc." Rice not reported separately.

The production statistics cover the growth of the years indicated, while those of imports and exports have to do with the same crop, but cover the fiscal years ending June 30, following. The consumption of domestic rice has been ascertained by deducting from the total production the quantity exported. This unexported quantity added to the net imports gives the total consumption. The net imports are the imports less the quantity of foreign rice reexported.

Table 6 shows the relation between the consumption of foreign and domestic rice in the United States for the past decade. Taking the period as a whole, there has been a general increase in both the production and consumption of rice. During the four years preceding 1899 the consumption of foreign rice showed a tendency to increase, the net imports having risen from 64,570,868 pounds in 1895 to 134,722,328 pounds in 1898. The percentage of the rice consumption imported during this period increased from 27.8 to 49.7. It is gratifying to note, however, that the large production of 1899 reduced the net imports for the fiscal year ending June 30, 1900, to the very low figure of 75,380,764 pounds, which was only 24.1 per cent of the consumption. Besides furnishing 75.9 per cent of its total consumption in 1899 this country exported 12,947,009 pounds of clean rice, or 5.2 per cent of the total production. The solution of the irrigation problem in Louisiana and Texas will enable the United States to show a rapid increase in the annual rice production during the next decade, undisturbed by the large variations shown in the crops of the past ten years. The rice territory along the Carolina and Georgia coast is subject to harvest storms, and the upland territory to drought. These disturbing factors will be largely offset by the increased territory made available by irrigation.


RICE CONSUMPTION, PRODUCTION AND NET IMPORTS
FROM 1890 TO 1899.
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
320
310
300
290
280
270
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
MILLIONS OF POUNDS.
CONSUMPTION (1)
PRODUCTION
NET IMPORTS
(1) CONSUMPTION 1891 ESTIMATED

The foregoing diagram illustrates graphically variations in production, in net imports, and in the total consumption of rice for the United States during the decade between 1890 and 1900. Each vertical line represents a year and each longitudinal line 10,000,000 pounds of rice. The line connecting the points where the quantity intersects the year forms the line of variation for the decade. Consumption statistics employed in this diagram cover the consumption of clean rice and not by-products.

Table 7 presents exports of rice, rice bran, meal, and polish, and imports of rice, rice flour, rice meal, and broken rice, 1891 to 1900

TABLE 7.—EXPORTS OF DOMESTIC RICE, AND RICE BRAN, MEAL, AND POLISH, AND IMPORTS OF RICE, AND RICE FLOUR, RICE MEAL, AND BROKEN RICE, YEARS ENDING JUNE 30, 1891 TO 1900.[1]

YEARS.	EXPORTS.						IMPORTS.					
	Total.		Rice.		Rice bran, meal, and polish.		Total.		Rice.		Rice flour, rice meal, and broken rice.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
1900	41,066,417	$867,387	12,947,009	$500,364	28,119,408	$167,023	116,679,891	$2,279,086	93,648,451	$1,904,915	23,031,440	$374,121
1899	15,384,689	118,809	852,704	38,511	14,481,985	80,298	204,177,293	3,930,149	153,837,026	3,152,771	50,340,267	777,378
1898	6,200,987	62,999	637,146	27,501	5,563,841	35,498	190,285,315	3,746,833	129,810,680	2,793,111	60,474,635	953,722
1897	3,905,754	34,730	387,288	14,617	3,518,466	20,113	197,816,134	3,517,160	133,939,930	2,555,960	63,876,204	961,200
1896	[2]15,081,554	93,754	[2]1,346,876	14,117	13,684,678	79,637	146,724,607	2,185,579	78,190,334	1,274,574	68,534,273	911,005
1895	1,623,336	16,454	124,296	4,687	1,499,040	11,767	219,564,320	3,445,512	141,801,411	2,353,974	78,262,909	1,091,538
1894	10,766,249	112,139	763,425	19,384	10,002,824	92,255	142,161,817	2,374,335	86,810,536	1,540,992	55,351,281	833,343
1893	13,711,798	153,384	756,992	25,126	12,954,806	128,208	147,483,828	2,790,151	81,031,944	1,598,625	66,451,884	1,191,526
1892	10,256,796	89,340	([3])	([3])	10,256,796	89,340	148,103,688	3,030,883	85,112,164	1,933,447	62,991,524	1,097,436
1891	3,490,895	59,714	540,620	33,012	2,950,275	26,702	214,363,582	4,559,540	133,104,063	3,170,132	81,259,519	1,389,408

[1] Commerce and Navigation of the United States. [2] 896,000 pounds damaged. [3] Included in "rice bran, etc."

Table 8 presents imports of rice and its by-products, by countries, for the year ending June 30, 1900.

TABLE 8.—IMPORTS, BY COUNTRIES, RICE, AND RICE FLOUR, RICE MEAL, AND BROKEN RICE, YEAR ENDING JUNE 30, 1900.

COUNTRIES.	TOTAL.		RICE.		RICE FLOUR, RICE MEAL, AND BROKEN RICE.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	116,679,891	$2,279,086	93,648,451	$1,904,915	23,031,440	$374,121
France	66,584	1,205	380	29	66,204	1,176
Germany	39,178,448	683,186	18,603,285	353,112	20,570,163	330,074
Italy	1,527,061	48,550	1,527,061	48,550	.....	.....
Netherlands	1,940,600	50,725	1,940,600	50,725	.....	.....
United Kingdom	18,378,015	370,004	16,470,735	335,937	1,907,280	34,067
Dominion of Canada:						
Nova Scotia, New Brunswick, etc	448	17	448	17	.....	.....
Quebec, Ontario, Manitoba, etc	5,018	84	5,018	84	.....	.....
British Columbia	4,865	649	4,865	649	.....	.....
Mexico	728,556	20,141	728,556	20,141	.....	.....
West Indies:						
British	1,200	60	1,200	60	.....	.....
Cuba	1,785	46	1,785	46	.....	.....
Brazil	180	3	180	3	.....	.....
Colombia	150	6	150	6	.....	.....
Chinese Empire	24,604,713	489,809	24,354,306	485,347	250,407	4,462
East Indies—British	123,375	1,034	123,375	1,034	.....	.....
Hongkong	4,813,633	92,725	4,720,708	91,238	92,925	1,487
Japan	24,718,735	491,471	24,569,699	488,631	144,036	2,840
Turkey in Asia	425	15	.....	.....	425	15
Hawaii	596,100	29,306	596,100	29,306	.....	.....

Table 9 presents imports of rice and its by-products, by countries, for the years ending June 30, 1891 to 1900.

TABLE 9.—IMPORTS, BY COUNTRIES, RICE AND ITS BY-PRODUCTS, IN POUNDS, YEARS ENDING JUNE 30, 1891 TO 1900.[1]

COUNTRIES.	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891
Total	116,679,891	204,177,293	190,285,315	197,816,134	146,724,607	219,564,320	142,161,817	147,483,828	148,103,688	214,363,582
Hawaii—free	596,100	2,595,600	4,414,300	5,881,600	4,354,500	5,144,087	9,115,483	8,473,800	7,489,700	7,840,900
Hawaii—dutiable				46			22,890			
Austria-Hungary—do				220						
Belgium—do			3,358	840	613				112,260	200,000
Denmark—do			110,286						448,000	2,240,000
France—do	66,584	1,455		490	2,536	244	121	716	2,206	396
Germany—do	39,173,448	68,876,114	101,329,151	93,130,979	76,631,164	109,091,207	57,592,434	63,911,049	59,046,542	92,775,543
Italy—do	1,527,061	1,295,549	985,872	935,864	901,592	894,056	648,906	725,949	478,627	373,943
Netherlands—do	1,940,600	3,283,467	9,366,562	7,321,861	698,419	10,732,022	2,068,497	22,400	143,936	621,540
Portugal—do					4,000			2,729		
Spain—do			2,205						1,102	1,217
Sweden and Norway—do								313		
United Kingdom—do	18,878,015	19,799,935	19,154,899	21,641,430	7,290,095	8,829,497	12,281,985	14,516,868	11,760,456	20,952,347
British Honduras—do					6,400					
Dominion of Canada:										
Nova Scotia, New Brunswick, etc.—do	448	1,922	10			244		55	100	224
Quebec, Ontario, Manitoba, etc—do	5,018	115,012	980	36,456	321	1,413	344	2,266	622	261
British Columbia—do	4,865	21,751	7,324	100	158,015	367,201	554,500	556,438	519,500	1,348,610
Central American States:										
Costa Rica—do		295						50		
Guatemala—do				5,850					5,100	5,635
Honduras—do										
Salvador—do	728,556	575,354	224,386	800		1,843				
Mexico—do	1,200		89,140	92,439	19,500	348,124	1,302	15,652	1,159	35,943
West Indies:										
British—do	1,785	163,384	663						300	5
Cuba—do			218	1,780	24,365	50	1,190	2,683	56,836	57,015
Porto Rico—do	180									
Brazil—do	150									26,455
Colombia—do									351	
Guiana—British—do	24,604,713	34,484,841	32,098,874	192						
Chinese Empire—do	123,875	10,387,439	1,267,524	29,753,135	27,219,663	40,473,266	33,727,366	32,603,476	30,870,205	39,601,761
East Indies:										
British—do					2,129,724	5,131,923	1,684,921	3,813,480	5,926,060	13,500,019
Dutch—do	4,813,633	5,166,408	3,679,174	413,733	197,057	56,000	16,522	27,547		
Hongkong—do	24,718,735	57,408,717	17,550,439	3,813,207	2,603,734	4,240,319	2,906,193	4,513,347	5,078,163	2,597,547
Japan—do	425			34,785,112	24,482,909	34,251,824	21,588,650	18,293,273	26,162,463	32,184,221
Turkey in Asia—do										
All other Asia—do		50					200			
Turkey in Africa—Egypt—do								2,050		

[1] Commerce and Navigation of the United States.

Table 10 presents the quantity and value of rice, and rice bran, rice meal, and polish exported, by countries, for the year ending June 30, 1900.

TABLE 10.—EXPORTS, BY COUNTRIES, QUANTITY AND VALUE OF RICE, AND RICE BRAN, RICE MEAL, AND POLISH; YEAR ENDING JUNE 30, 1900.[1]

COUNTRIES TO WHICH EXPORTED.	TOTAL.		RICE.		RICE BRAN, RICE MEAL, AND POLISH.	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	41,066,417	$667,387	12,947,009	$500,364	28,119,408	$167,023
EUROPE.						
France	23,096	1,559	23,096	1,559		
Germany	21,694,171	126,878	4,607	261	21,689,564	126,617
Greenland, Iceland, etc	589	38	589	38		
Netherlands	4,058,200	28,261			4,058,200	28,261
United Kingdom	2,773,065	32,332	428,821	20,334	2,344,244	11,998
NORTH AMERICA.						
Bermuda	1,082	80	1,082	80		
British Honduras	25,400	402	10,000	321	15,400	81
Quebec, Ontario, Manitoba, etc	7,424	389	7,424	389		
British Columbia	24,272	1,263	24,272	1,268		
Central American States:						
Costa Rica	2,500	16			2,500	16
Guatemala	14,723	442	14,723	442		
Honduras	79,842	2,577	79,842	2,577		
Nicaragua	507,375	17,735	497,875	17,685	9,500	50
Mexico	150,663	5,178	150,663	5,178		
West Indies:						
British	100	4	100	4		
Cuba	155,486	3,145	155,486	3,145		
Haiti	700	36	700	36		
Porto Rico	4,852,008	153,882	4,852,008	153,882		
Santo Domingo	325	20	325	20		
SOUTH AMERICA.						
Colombia	23,111	991	23,111	991		
OCEANIA.						
French Oceania	2,697	94	2,697	94		
Guam	40,200	1,193	40,200	1,193		
Hawaii	6,619,188	290,575	6,619,188	290,575		
Tongo, Samoa, etc	10,200	297	10,200	297		

[1] Commerce and Navigation of the United States.

Table 11 presents exports of domestic rice and its by-products, by countries, for the years ending June 30, 1891 to 1900.

TABLE 11.—EXPORTS OF DOMESTIC RICE AND ITS BY-PRODUCTS, BY COUNTRIES, YEARS ENDING JUNE 30, 1891 TO 1900.[1]

COUNTRIES TO WHICH EXPORTED.	1900 (pounds).	1899 (pounds).	1898 (pounds).	1897 (pounds).	1896 (pounds).	1895 (pounds).	1894 (pounds).	1893 (pounds).	1892 (pounds).	1891 (pounds).
Total	41,066,417	15,334,689	6,200,987	3,905,754	15,031,554	1,623,386	10,766,249	[2]13,711,798	[2]10,256,796	[3]3,490,895
Belgium										450
France	23,096	45,709	35,812	19,952			30,765			31,450
Germany	21,694,171	13,029,985	5,547,922	3,493,542	10,350,557	809,205	9,677,859			2,620
Greenland, Iceland, etc	589									
Netherlands	4,058,200	728,000		27,000	56,000		154,560			
Russia, Baltic and White seas		800								
Sweden and Norway		350								
United Kingdom	2,773,065	1,052,719	400,596	118,390	2,606,346	54,759	179,365			240,444
Bermuda	1,082	681	948	500	777					
British Honduras	25,400	8,083	31,886	4,020	620	2,540	7,725			675
Dominion of Canada:										
Nova Scotia, New Brunswick, etc					50					
Quebec, Ontario, Manitoba, etc	7,424	22,116	38,688			80,650				1,630
British Columbia	24,272	565	985		8,030	5,600	630			
Newfoundland and Labrador			340	448						442
Central American States:										
Costa Rica	2,500		2,015		22,825	500	251,575			11,979
Guatemala	14,723	28,565	37,513	49,226	20,425	4,641	34,096			
Honduras	79,842	31,450	32,746	39,989	15,784	7,418	80,955			710
Nicaragua	507,375	31,234	6,000	106,524	135,184	18,344	122,545			62,487
Mexico	150,663	125,443	23,660	23,924	29,565	6,695	29,330			39,263
Miquelon, Langley, etc			318							1,010
West Indies:										
British	100	1,674	2,559	3,159	3,551					2,111
Cuba	155,486	209,239	4,009		1,693,478	655,950	122,000			17,433
Dutch		200	1,293	2,055	1,305					85
French		310								
Haiti	700	126	15,490	3,332	3,667	3,283				25,290
Porto Rico	4,852,008	2,754			9,700					200
Santo Domingo	325	691	400		516					3,026
Brazil										75,785
Colombia	23,111	10,471	16,484	12,158	71,075	23,750	74,844			2,775
Peru										3,990
Venezuela		416	728	1,535	662					10,565
British Australasia		2,908			1,437					1,250
French Oceania	2,697									
Guam	40,200									
Hawaii	6,619,188									
Tonga, Samoa, etc	10,200									
Liberia		100								5,000
Portuguese Africa		100	600							895

[1] Commerce and Navigation of the United States.
[2] Rice, etc., not enumerated by countries, 1892 to 1893, inclusive.
[3] Includes an item of 2,950,275 pounds of rice polish exported; destination of same not given.

Tables 7, 9, and 11 show the foreign trade in rice and the distribution of exports during each year of the decade ending June 30, 1900, while Tables 7, 8, and 10 show the distribution of the foreign trade in rice for the census year 1900. Although the foreign rice trade has fluctuated very much from year to year, there has been a general decrease in imports and a corresponding increase in exports. The imports of rice and its by-products decreased from 214,363,582 pounds in 1891 to 116,679,891 pounds in 1900, while the exports for the same period increased from 3,490,895 to 41,066,417 pounds. Exports prior to 1900 were on the average less than one-half of 1 per cent of the production, except in 1896, when a large proportion of damaged rice was exported. More than one-half of the exports of rice and its by-products, during the year ending June 30, 1900, went to Germany, the remainder being sent principally to the West Indies and Central America. The imports of whole rice have varied greatly from year to year, but the amount of by-products imported, beginning with 81,259,519 pounds in 1891, has steadily decreased to 23,031,440 pounds in 1900. The amount of whole rice imported has been in inverse ratio to production, except in 1899 when a substantial increase in production failed to produce a reduction in imports. Importations of rice are chiefly for food and come principally from Japan, China, and Germany. There was a marked change in the foreign rice trade of the United States during the census year. The exportation of domestic whole rice was 12,947,009 pounds, or 5.2 per cent of the production of 1899. Of this quantity 6,619,188 pounds went to Hawaii, and 4,852,008 pounds to Porto Rico. The large increase in exports to these countries has been occasioned by the change of political relationship between them and the United States.

Table 12 presents the exports of domestic clean rice, by customs districts, for the years ending June 30, 1891 to 1900.

TABLE 12.—EXPORTS OF DOMESTIC CLEAN RICE, BY CUSTOM DISTRICTS, YEARS ENDING JUNE 30, 1891 TO 1900.[1]

DISTRICTS FROM WHICH EXPORTED.	1900		1899		1898		1897		1896	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	12,947,009	$500,364	852,704	$38,511	637,146	$27,501	387,288	$14,617	1,346,876	$14,117
Baltimore, Md	28,425	1,063								
Bangor, Me	589	38								
Bath, Me	6,000	300								
Belfast, Me										
Boston and Charlestown, Mass							9,160	458		
Charleston, S. C	2,700	145	1,190	79	2,831	159			750	50
New Bedford, Mass					600	28				
New York, N. Y	5,100,633	168,148	306,499	19,604	352,620	18,518	91,122	4,851	83,867	4,307
Philadelphia, Pa			5,249	196					50	4
Providence, R. I									200	10
St. Johns, Fla										
St. Augustine, Fla										
Savannah, Ga	14,534	760	13,808	813	14,965	852	10,745	586		
Brazos de Santiago, Tex	76,787	2,015					21,484	427	28,446	601
Corpus Christi, Tex	1,165	46	76,962	1,912						
Galveston, Tex	155,200	3,134			1,100	28	665	31	69,400	1,388
Key West, Fla	286	9	72,736	2,110	1,580	57	220	8		
Mobile, Ala	5,382	192	6,715	289	10,913	427				
New Orleans, La	662,406	24,662	246,393	8,563	190,354	4,988	251,702	8,193	1,155,774	7,827
Paso del Norte, Tex	26,642	2,108			20,020	1,001				
Pearl River, Miss										
Saluria, Tex	42,529	898	47,776	1,507	140	6			146	8
Tampa, Fla			72,000	3,284						
Alaska	8,722	777	565	36	985	54				
Arizona			450	15	485	30	2,190	63	763	51
Puget Sound, Wash	15,550	486								
San Diego, Cal			95	4	565	29			200	7
San Francisco, Cal	6,792,085	295,199	150	7	1,300	160				
Champlain, N. Y	2,616	130	1,721	69						
Huron, Mich	1,860	93	100	4	33,588	1,158				
Minnesota, Minn			295	19	100	6				
Montana and Idaho									7,280	364
Oswegatchie, N. Y	280	10								
Vermont, Vt	2,668	156								

DISTRICTS FROM WHICH EXPORTED.	1895		1894		1893		1892[2]		1891	
	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.
Total	124,296	$4,687	763,425	$19,884	756,992	$25,126	[2]10,256,796	[2]$89,340	540,620	$33,012
Baltimore, Md	16,895	676			52,429	2,555			6,908	346
Bangor, Me										
Bath, Me										
Belfast, Me					990	59				
Boston and Charlestown, Mass					134,564	5,076			1,120	39
Charleston, S. C										
New Bedford, Mass										
New York, N. Y	3,283	141							444,045	29,217
Philadelphia, Pa									200	9
Providence, R. I										
St. Johns, Fla										
St. Augustine, Fla					40	4				
Savannah, Ga										
Brazos de Santiago, Tex			5,578	141					1,900	102
Corpus Christi, Tex									4,435	228
Galveston, Tex										
Key West, Fla	212	11	122,580	2,068						
Mobile, Ala										
New Orleans, La	97,288	3,516	611,087	16,986	568,969	16,532			41,601	1,068
Paso del Norte, Tex										
Pearl River, Miss	1,063	38								
Saluria, Tex	665	48	23,550	658						
Tampa, Fla										
Alaska										
Arizona										
Puget Sound, Wash			630	31						
San Diego, Cal									2,904	181
San Francisco, Cal									35,877	1,714
Champlain, N. Y										
Huron, Mich										
Minnesota, Minn									1,630	108
Montana and Idaho	4,240	212								
Oswegatchie, N. Y	650	45								
Vermont, Vt										

[1] Commerce and Navigation of the United States.

[2] Not enumerated by districts; total for year includes values for bran, meal flour, etc.

This table shows a decided increase in the exports of rice at nearly all the customs districts and especially at San Francisco, where the exports increased from practically nothing in 1899 to 6,792,085 pounds in 1900. The leading customs districts in the exportation of rice in 1900 were San Francisco, New York, and New Orleans.

HISTORICAL AND DESCRIPTIVE.

If its importance as a food product is to be measured by the number of persons who consume it, rice must, without doubt, be considered the greatest cereal. The countries in which rice forms the principal and, very often, the only food, have a population variously estimated to be from 825,000,000 to 900,000,000 of the world's population of nearly a billion and a half. There is no authentic record of its origin, though frequent mention is made of it in ancient literature. Nearly all authorities agree, however, that the Chinese were its first cultivators.

It was introduced, for cultivation, into the United States in 1647, when Sir William Berkeley, then governor of Virginia, received a half bushel of the grain from England. He caused this to be planted and from it a yield of 16 bushels was obtained. But with this the industry appears to have rested until 1694. In that year a ship bound from Madagascar was obliged to seek refuge in the harbor at Charleston, S. C., owing to a violent storm at sea. The captain of the vessel finding an old friend, Thomas Smith, governor of the province, presented him with a sack of the grain. Experiments in its cultivation were begun, resulting in making South Carolina, for more than a century, the leading rice producing state of this country.

Up to 1860 the industry was confined chiefly to the Carolinas and Georgia, these states producing practically the entire commercial crop. But the revolution in the system of labor, and the almost complete annihilation of the capital of the planters by the Civil War resulted in a new beginning for this industry, which brought radical changes in farming methods and in milling processes.

The effect of the change in labor conditions, resulting from the war, has been instrumental in keeping rice production practically at a standstill in the two Carolinas and Georgia, and to increase its culture on the prairie lands of Louisiana, where improved machinery can be more advantageously employed. For example, the combined production of the Carolinas and Georgia decreased from 56,641,486 pounds in 1869 to 50,741,787 pounds in 1889, while that of Louisiana increased from 15,854,012 to 75,645,433 pounds during the same period. The Twelfth Census, reporting for the crop of 1899, gives the Carolinas and Georgia 66,427,270 and Louisiana 172,732,430 pounds. The remarkable increase in rice culture in Louisiana and Texas during the past decade is due to the discovery that the lands of this region are both suitable to rice culture and capable of satisfactory irrigation. The farmers no longer raise "Providence rice," a localism for a crop dependent upon rainfall, but the rivers and bayous have been utilized and canal companies have grown rich furnishing water to rice planters. When the flooding season is over, these lands are so readily and thoroughly drained as to permit of the employment of modern harvesting machines.

With the opening up of these vast prairies to rice culture have come the gang plow, the horse drill, the twine binder, and the steam thresher. One harvesting machine, operated by one man and five mules, does in one day what formerly required a whole family and hired help to do in a season. Nowhere else in the rice-growing belt has it been possible to introduce such implements, owing to the inability of the growers to properly drain their rice lands.

The problem of a fuel supply has been removed by the recent discovery of natural oil in Texas. Beaumont, the famous oil center, is in the midst of this rice belt. Oil tanks already dot this section, and rice farmers and rice millers alike are using the oil for fuel. There has thus been made available for rice culture in southwest Louisiana and southeast Texas a vast territory which will guarantee a steady increase of the rice crop, unaffected by drought and so cheapened by the utilization of machinery as to encourage the hope that the United States may at no distant time not only supply its own consumption requirements but successfully compete with the East in the markets of the world.

Although rice is one of the oldest cereals and constitutes the principal food of over half the people of the world, the methods of cleaning it have until recently been of very crude design. The great advancement in the methods of recent years is largely the result of greatly increased production and consumption among the civilized countries and the technical requirements of a fanciful trade.

The primitive method of milling rice in the United States, and at present in vogue in China and other foreign countries, is to place a small quantity of the grain in a hollow stone or block of wood and pound it with a stone pestle. The blow cracks the hull, and the friction created by the sliding motion of the rice under the pestle removes the hull from the cuticle. The hulls and bran are gotten rid of by winnowing. The first advance from this process was the use of a mortar made of a short section of a hollowed log, the pestle being a heavy pounder attached to a horizontal beam 6 to 8 feet long, which rested upon a fulcrum, 4 to 5 feet from the mortar. The pounder was raised and dropped by quickly stepping on and off the shorter end of the beam. This simple process and the fanning mill are in use in oriental countries at this time. Such a mill cleans about 11 bushels of paddy a day. The next advance was the use of the water wheel as a motive power, geared to a horizontal shaft. The pounder was a vertical beam, about 10 feet long and 6 inches square. As the horizontal shaft revolved, a rounded arm projecting from it caught

a pointed pin in the vertical shaft, raised the pounder, and slipping past dropped it into the mortar of rice. This was repeated until the hulls and bran were separated from the grain.

The usual process of milling the rice of commerce is more complicated. The paddy is first screened to remove trash and other foreign particles. The hulls are then removed by rapidly-revolving mill stones, and separated from the whole and broken rice by means of screens and blowers. This process does not remove the thin cuticle of the grain; to do this it is passed through a huller or subjected to heavy pounding. The huller is a short, horizontal tube of cast iron, with interior ribs and a funnel at one end to admit the rice. Within this tube revolves a shaft, with ribs so adjusted that the revolution of the shaft creates sufficient friction to remove the cuticle. The rice passes out of the huller at the end opposite the funnel, to be separated from the by-products and polished. In other mills the cuticle is removed by pounding in mortars, with pestles weighing from 380 to 400 pounds. Strange to say, this heavy weight breaks comparatively few grains. When it is sufficiently cleaned, the flour and bran are separated, and the grain sent to cooling pans, where it remains for eight or nine hours. After passing through the huller or the mortar, the rice is ready for the finishing process, polishing, which gives it a pearly luster. This finish is secured by passing the whole grains through a rapidly revolving screen with brushes, or with wire gauze and sheepskin.

This process gives to the rice grain its fine, glossy surface, and adds to its commercial value, but detracts from its value as a food. The outer surface of the clean, unpolished rice contains almost all the fats of the grain, and its removal materially lessens both the flavor and nutritive value. The fashion of highly polishing the grain for the general trade does not tend to popularize it as a food. In its preparation for local consumption rice is seldom or never polished. This may explain the reason why travelers remark upon the excellent quality of oriental rice compared with that of commerce.

The grading of clean rice is not according to quality. From one kind of paddy may be obtained several grades according to the size of the grain, whole or broken, its susceptibility to polish, and general appearance. The average price for the crop of 1899 varied from 2½ cents per pound for common, to 6 cents for fancy grades. No. 2 rice, consisting of broken grains and fragments, and worth about 1⅝ cents per pound, is mostly used by breweries, and therefore called "brewers' rice." This arbitrary grading of rice according to size and luster, without regard to quality, makes breakage in milling a serious problem for both producer and miller. When a grain breaks it loses a large percentage of its commercial value, though its food value is unchanged. Rice worth 6½ cents as extra fancy, when broken so as to pass through a No. 12 sieve, is worth only 1½ cents.

The proportion of whole rice obtained by milling varies greatly, dependent largely upon the quality of the paddy. The selection of seed, cultivation, and curing all decidedly affect the friability of the grain. Careful attention on the part of the planter goes further to decrease the percentage of broken rice than that of the miller himself. The annual loss in the commercial value of the rice crop, on account of the difference in price between whole and broken rice, has been estimated by the United States Department of Agriculture (Bulletin No. 22, 1899) at about $2,000,000. The most productive is not usually the best milling rice.

TABLE 13.—RICE, CLEANING AND POLISHING, BY STATES: 1900.

	United States.	Alabama.	Florida.	Georgia.	Louisiana.	North Carolina.	South Carolina.	All other states.[1]
Number of establishments	80	4	4	4	37	4	18	9
Capital:								
Total	$2,601,352	$2,995	$4,510	$113,155	$1,818,144	$51,325	$293,385	$317,838
Land	$202,927	$95	$550	$30,085	$119,109	$5,425	$46,012	$1,651
Buildings	$610,808	$400	$800	$40,075	$450,260	$13,600	$97,958	$7,715
Machinery, tools, and implements	$764,125	$2,100	$2,960	$20,775	$522,250	$19,300	$51,090	$145,650
Cash and sundries	$1,023,492	$400	$200	$22,220	$726,525	$13,000	$98,325	$102,822
Proprietors and firm members	71	5	5	4	26	2	22	7
Salaried officials, clerks, etc.:								
Total number	169			5	126	9	18	11
Total salaries	$182,033			$4,800	$141,122	$8,325	$15,762	$12,024
Officers of corporations—								
Number	27				20	4	2	1
Salaries	$50,570				$42,450	$4,400	$2,720	$1,000
General superintendents, managers, clerks, etc—								
Total number	142			5	106	5	16	10
Total salaries	$131,463			$4,800	$98,672	$3,925	$13,042	$11,024
Men—								
Number	138			5	104	4	16	9
Salaries	$129,744			$4,800	$97,802	$3,700	$13,042	$10,400
Women—								
Number	4				2	1		1
Salaries	$1,719				$870	$225		$624
Wage-earners, including pieceworkers and total wages:	1,138	7	8	19	797	41	155	111
Greatest number employed at any one time during the year	591	7	8	12	414	7	78	65
Least number employed at any one time during the year	651	3	3	14	412	30	112	77
Average number								

[1] Includes establishments distributed as follows: Washington, 2; Texas, 1; Oregon, 1; New York, 2; Mississippi, 2; California, 1.

TABLE 13.—RICE, CLEANING AND POLISHING, BY STATES: 1900—Continued.

	United States.	Alabama.	Florida.	Georgia.	Louisiana.	North Carolina.	South Carolina.	All other States.[1]
Wage-earners, including pieceworkers and total wages—Continued.								
Wages	$265,585	$360	$976	$8,250	$180,523	$7,675	$25,243	$42,558
Men, 16 years and over—								
Average number	639	3	3	14	400	30	112	77
Wages	$262,042	$360	$976	$8,250	$176,980	$7,675	$25,243	$42,558
Children, under 16 years—								
Average number	12	.....	.....	.....	12	.....	.....	.....
Wages	$3,543	.....	.....	.....	$3,543	.....	.....	.....
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	872	6	4	19	574	39	132	98
February	785	6	4	19	518	39	120	84
March	711	6	1	17	446	39	113	89
April	578	4	.....	12	320	39	113	90
May	435	4	.....	15	182	39	109	86
June	285	4	.....	13	90	12	104	62
July	204	.....	3	2	92	9	89	59
August	316	.....	3	2	208	9	42	52
September	575	.....	5	16	355	12	134	53
October	914	1	7	19	633	37	144	73
November	1,012	3	7	19	702	41	146	94
December	994	2	7	18	684	41	144	98
Children, under 16 years—								
January	14	.....	.....	.....	14	.....	.....	.....
February	14	.....	.....	.....	14	.....	.....	.....
March	12	.....	.....	.....	12	.....	.....	.....
April	8	.....	.....	.....	8	.....	.....	.....
May	7	.....	.....	.....	7	.....	.....	.....
June	3	.....	.....	.....	3	.....	.....	.....
July	2	.....	.....	.....	2	.....	.....	.....
August	7	.....	.....	.....	7	.....	.....	.....
September	18	.....	.....	.....	18	.....	.....	.....
October	22	.....	.....	.....	22	.....	.....	.....
November	18	.....	.....	.....	18	.....	.....	.....
December	14	.....	.....	.....	14	.....	.....	.....
Miscellaneous expenses:								
Total	$230,203	$29	$109	$2,690	$162,104	$3,782	$6,862	$51,627
Rent of works	$19,556	.....	$36	$100	$4,410	$500	$235	$14,275
Taxes, not including internal revenue	$24,769	$6	$36	$1,306	$17,394	$157	$4,785	$1,085
Rent of offices, interest, etc	$165,784	$23	$37	$1,284	$131,503	$3,125	$4,842	$24,970
Contract work	$20,094	.....	.....	.....	$8,797	.....	.....	$11,297
Materials used:								
Aggregate cost	$7,575,522	$8,615	$10,855	$161,070	$4,954,135	$200,465	$856,790	$1,388,592
Principal materials—								
Total cost	$7,382,132	$8,442	$10,530	$158,703	$4,819,645	$187,020	$842,497	$1,360,295
Purchased in raw state	$7,169,294	$8,435	$10,505	$154,433	$4,644,838	$175,700	$821,698	$1,358,685
Purchased in partially manufactured form	$212,838	$7	$25	$4,270	$174,807	$11,320	$20,799	$1,610
Fuel	$89,307	$100	$235	$1,535	$72,233	$2,435	$6,367	$6,402
Rent of power and heat	$8,560	.....	.....	.....	$300	.....	.....	$8,260
Mill supplies	$44,929	$48	$80	$782	$31,999	$760	$7,625	$3,635
Freight	$50,594	$25	$10	$50	$29,958	$10,260	$301	$10,000
Products:								
Value	$8,723,726	$4,816	$13,995	$184,804	$5,736,451	$238,520	$973,132	$1,572,008
Comparison of products:								
Number of establishments reporting for both years	47	3	2	3	23	.....	9	7
Value for census year	$5,296,141	$4,200	$6,778	$182,494	$3,561,956	.....	$184,960	$1,355,758
Value for preceding business year	$4,370,897	$4,150	$3,500	$76,754	$2,905,962	.....	$160,320	$1,220,211
Power:								
Number of establishments reporting power	78	4	3	4	37	3	18	9
Total horsepower	7,573	28	60	216	5,106	140	913	1,110
Owned—								
Engines—								
Steam—								
Number	90	2	3	3	50	3	24	5
Horsepower	7,002	18	42	210	5,059	125	898	640
Water wheels—								
Number	9	2	1	1	.....	1	1	3
Horsepower	264	10	18	6	.....	15	15	200
Electric motors—								
Number	2	.....	.....	.....	2	.....	.....	.....
Horsepower	27	.....	.....	.....	27	.....	.....	.....
Rented—								
Electric horsepower	280	.....	.....	.....	10	.....	.....	270
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	80	4	4	4	37	4	18	9
No employees	6	.....	.....	1	.....	1	3	1
Under 5	38	4	4	2	13	1	12	2
5 to 20	15	.....	.....	1	9	1	.....	4
21 to 50	14	.....	.....	.....	9	1	2	2
51 to 100	6	.....	.....	.....	5	.....	1	.....
101 to 250	1	.....	.....	.....	1	.....	.....	.....

[1] Includes establishments distributed as follows: Washington, 2; Texas, 1; Oregon, 1; New York, 2; Mississippi, 2; California, 1

STARCH.

STARCH.

By Dr. H. W. Wiley.

A comparative summary of the starch manufacture of the United States from 1850 to 1900, inclusive, with percentages of increase for each decade, is given in Table 1.

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

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870	1850 to 1860
Number of establishments	124	80	139	195	167	146	55.0	[1]42.4	[1]28.7	16.8	14.4
Capital	$11,671,567	$4,929,155	$5,328,256	$2,741,675	$2,051,710	$692,675	136.8	[1]7.5	94.3	33.6	196.2
Salaried officials, clerks, etc., number	406	[2]218	(3)	(3)	(3)	(3)	86.2	.....	.....	.....	.....
Salaries	$451,334	[2]$229,909	(3)	(3)	(3)	(3)	96.3	.....	.....	.....	.....
Wage-earners, average number	2,655	2,903	3,119	2,072	1,073	694	[1]8.5	[1]6.9	50.5	93.1	54.6
Total wages	$1,099,696	$959,108	$919,197	$900,719	$298,526	$193,224	14.7	4.3	2.1	201.7	54.5
Men, 16 years and over	2,088	2,307	2,710	1,712	1,063	686	[1]9.5	[1]14.9	58.3	61.1	55.0
Wages	$986,852	$840,780	(3)	(3)	(3)	(3)	17.4	.....	.....	.....	.....
Women, 16 years and over	535	484	301	317	10	8	10.5	60.8	[1]5.0	3,070.0	25.0
Wages	$107,720	$105,362	(3)	(3)	(3)	(3)	2.2	.....	.....	.....	.....
Children, under 16 years	32	112	108	43	.....	.....	[1]71.4	3.7	151.2	.....	.....
Wages	$5,124	$12,966	(3)	(3)	.....	.....	[1]60.5	.....	.....	.....	.....
Miscellaneous expenses	$700,277	$1,108,135	(4)	(4)	(4)	(4)	[1]36.8	.....	.....	.....	.....
Cost of materials used	$5,806,422	$5,153,677	$4,911,060	$3,884,909	$1,380,000	$799,459	12.7	4.9	26.4	181.5	72.6
Value of products	$9,232,984	$8,934,517	$7,477,742	$5,994,422	$2,828,258	$1,261,468	3.3	19.5	24.7	112.3	128.8

[1] Decrease.
[2] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 7.)
[3] Not reported separately.
[4] Not reported.

The data of this table show that the amount of capital increased in fifty years from $692,675, invested in 146 establishments, to $11,671,567 invested in 124 establishments, an increase of $10,978,892; wages from $193,224 to $1,099,696, an increase of $906,472. The smaller increase in wages is due in part to the fact that the technical operations in starch making have been greatly improved, requiring a smaller proportion of labor. The total cost of the materials used increased from $799,459 to $5,806,422, or $5,006,963; the value of products from $1,261,468 to $9,232,984, or $7,971,516.

Table 2 is a comparative summary, by states, for 1890 and 1900.

TABLE 2.—COMPARATIVE SUMMARY, BY STATES: 1890 AND 1900.

		United States.	Connecticut.	Florida.	Illinois.	Indiana.	Iowa.	Maine.	Massachusetts.
Number of establishments	1900	124	8	(1)	8	4	4	45	5
	1890	80	7	3	(2)	8	4	18	6
Capital: Total	1900	$11,671,567	$377,400	(1)	$169,210	$2,872,833	$700,064	$344,349	$344,999
	1890	$4,929,155	$94,879	$675	(2)	$894,800	$181,890	$117,350	$415,900
Land	1900	$2,464,141	$19,900	(1)	$2,600	$806,500	$30,000	$23,530	$29,320
	1890	$324,011	$6,600	$45	(2)	$64,000	$6,000	$5,300	$22,000
Buildings	1900	$3,287,110	$21,950	(1)	$30,000	$493,925	$225,000	$150,750	$67,300
	1890	$1,377,608	$6,100	$130	(2)	$310,000	$27,000	$63,700	$31,000
Machinery, tools, and implements	1900	$3,119,703	$157,845	(1)	$103,600	$1,294,034	$205,234	$71,365	$53,271
	1890	$1,046,036	$9,400	$355	(2)	$226,500	$21,175	$48,350	$203,700
Cash and sundries	1900	$2,800,613	$177,705	(1)	$33,010	$278,374	$239,330	$98,704	$195,108
	1890	$2,181,500	$72,779	$145	(2)	$294,300	$127,715	.....	$159,200
Salaried officials, clerks, etc., number	1900	406	92	(1)	6	7	35	17	21
	[3]1890	218	17	5	(2)	32	22	15	10
Salaries	1900	$451,334	$57,180	(1)	$7,400	$7,871	$37,842	$3,475	$23,788
	[3]1890	$229,909	$18,815	$1,590	(2)	$33,045	$21,937	$2,690	$10,064

[1] Reported in "all other states" in 1900.
[2] Reported in "all other states" in 1890.
[3] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 7.)

TABLE 2.—COMPARATIVE SUMMARY, BY STATES: 1890 AND 1900—Continued.

		United States.	Connecticut.	Florida.	Illinois.	Indiana.	Iowa.	Maine.	Massachusetts.
Wage-earners, average number	1900	2,655	113	(1)	86	210	327	111	65
	1890	2,909	43	1	(2)	658	106	309	47
Total wages	1900	$1,099,696	$40,128	(1)	$52,600	$89,200	$114,881	$34,824	$34,736
	1890	$959,108	$13,968	$60	(2)	$218,695	$35,074	$32,165	$26,508
Men, 16 years and over	1900	2,088	106	(1)	64	174	248	111	58
	1890	2,807	34	.....	(2)	524	57	302	47
Wages	1900	$986,852	$37,838	(1)	$46,100	$82,735	$97,050	$34,824	$32,736
	1890	$840,780	$12,220	.....	(2)	$190,864	$25,650	$31,885	$26,508
Women, 16 years and over	1900	535	5	(1)	17	36	77	.....	7
	1890	484	9	.....	(2)	112	34	7	.....
Wages	1900	$107,720	$1,990	(1)	$5,000	$6,465	$17,331	.....	$2,000
	1890	$105,362	$1,748	.....	(2)	$25,900	$7,174	$280	.....
Children, under 16 years	1900	32	2	(1)	5	.....	2	.....	.....
	1890	112	.....	1	(2)	22	15	.....	.....
Wages	1900	$5,124	$800	(1)	$1,500	.....	$500	.....	.....
	1890	$12,966	.....	$60	(2)	$1,931	$2,250	.....	.....
Miscellaneous expenses	1900	$700,277	$57,366	(1)	$22,528	$22,676	$59,192	$9,176	$28,708
	1890	$1,108,135	$18,549	$10	(2)	$71,782	$50,985	$19,579	$5,003
Cost of materials used	1900	$5,806,422	$285,830	(1)	$345,824	$549,830	$623,814	$358,716	$259,652
	1890	$5,153,677	$147,789	$530	(2)	$1,062,221	$166,453	$222,417	$160,659
Value of products	1900	$9,232,984	$591,000	(1)	$542,190	$989,639	$896,831	$555,576	$390,161
	1890	$8,034,517	$299,625	$2,816	(2)	$1,580,543	$355,150	$315,225	$214,000

		Michigan.	Minnesota.	Missouri.	New Hampshire.	New York.	Ohio.	Wisconsin.	All other states.[3]
Number of establishments	1900	4	8	3	4	15	5	6	10
	1890	(4)	6	(4)	(2)	16	3	(2)	10
Capital: Total	1900	$408,921	$209,274	$24,700	$8,100	$3,547,305	$2,073,209	$93,250	$497,958
	1890	(4)	$94,250	(4)	(2)	$2,189,934	$710,825	(2)	$228,652
Land	1900	$74,911	$6,975	.....	$925	$717,180	$705,000	$10,450	$36,850
	1890	(4)	$4,600	(4)	(2)	$140,000	$52,566	(2)	$22,900
Buildings	1900	$102,188	$55,000	.....	$5,000	$1,072,223	$875,000	$22,000	$166,774
	1890	(4)	$41,100	(4)	(2)	$482,200	$340,028	(2)	$76,350
Machinery, tools, and implements	1900	$132,050	$59,825	$3,700	$1,725	$696,892	$269,703	$36,750	$38,709
	1890	(4)	$29,500	(4)	(2)	$317,300	$122,006	(2)	$67,750
Cash and sundries	1900	$99,772	$87,474	$21,000	$450	$1,061,010	$223,506	$24,050	$260,620
	1890	(4)	$19,050	(4)	(2)	$1,250,434	$196,225	(2)	$61,652
Salaried officials, clerks, etc., number	1900	35	5	25	.....	79	31	7	46
	[5]1890	(4)	10	(4)	(2)	66	22	(2)	19
Salaries	1900	$35,780	$2,780	$33,600	.....	$149,169	$39,815	$4,020	$48,664
	[5]1890	(4)	$7,843	(4)	(2)	$105,231	$22,370	(2)	$11,824
Wage-earners, average number	1900	88	57	70	4	996	199	34	300
	1890	(4)	73	(4)	(2)	1,175	341	(2)	150
Total wages	1900	$30,166	$23,287	$19,475	$1,465	$471,662	$78,159	$15,267	$93,846
	1890	(4)	$26,380	(4)	(2)	$436,887	$121,405	(2)	$47,966
Men, 16 years and over	1900	51	57	19	4	804	157	30	205
	1890	(4)	73	(4)	(2)	889	266	(2)	115
Wages	1900	$25,166	$23,287	$10,480	$1,465	$437,322	$67,949	$14,467	$75,488
	1890	(4)	$26,380	(4)	(2)	$382,576	$103,075	(2)	$41,622
Women, 16 years and over	1900	32	.....	51	.....	174	39	4	93
	1890	(4)	.....	(4)	(2)	224	65	(2)	33
Wages	1900	$5,000	.....	$9,045	.....	$32,130	$9,850	$800	$18,109
	1890	(4)	.....	(4)	(2)	$47,266	$16,770	(2)	$6,224
Children, under 16 years	1900	.....	.....	.....	.....	18	3	.....	2
	1890	(4)	.....	(4)	(2)	62	10	(2)	2
Wages	1900	.....	.....	.....	.....	$2,210	$360	.....	$254
	1890	(4)	.....	(4)	(2)	$7,045	$1,560	(2)	$120
Miscellaneous expenses	1900	$54,056	$10,570	$12,020	$425	$303,643	$84,396	$9,999	$25,522
	1890	(4)	$10,631	(4)	(2)	$822,659	$95,179	(2)	$13,808
Cost of materials used	1900	$161,089	$250,594	$126,610	$14,387	$1,704,054	$572,168	$100,719	$453,695
	1890	(4)	$210,536	(4)	(2)	$2,188,667	$677,999	(2)	$321,456
Value of products	1900	$330,183	$329,566	$230,000	$18,500	$2,589,903	$940,511	$154,080	$674,894
	1890	(4)	$350,026	(4)	(2)	$4,016,181	$1,109,026	(2)	$691,925

[1] Reported in "all other states" in 1900.
[2] Reported in "all other states" in 1890.
[3] Includes establishments distributed as follows in 1900: California, 2; Florida, 2; Maryland, 1; Nebraska, 2; New Jersey, 1; North Dakota, 1; Pennsylvania, 1. In 1890: Illinois, 1; Kansas, 1; Nebraska, 1; New Hampshire, 1; Pennsylvania, 1; Rhode Island, 1; Vermont, 2; Wisconsin, 2. Kansas, Rhode Island, and Vermont not reported in 1900.
[4] Not reported in 1890.
[5] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 7.)

While the value of products as a whole increased 3.3 per cent during the decade, 1890 to 1900, a decrease is shown for a number of states. This is particularly noticeable in New York, where it was 35.5 per cent; in Indiana, 37.4 per cent; and in Ohio, 15.2 per cent. This may be in part attributed to changes in the location of the manufacture, owing to an industrial combination.

New York was first in rank, Indiana second, and Ohio third; the same positions they held in 1890.

Table 3 shows the distribution of establishments, 1890 and 1900, by states geographically arranged, with increase for the decade.

TABLE 3.—NUMBER OF ESTABLISHMENTS, 1890 AND 1900, WITH INCREASE DURING THE DECADE, BY STATES, ARRANGED GEOGRAPHICALLY.

	1900	1890	Increase.
United States	124	80	44
New England states	62	34	28
Maine	45	18	27
New Hampshire	4	1	3
Vermont	.....	2	[1]2
Massachusetts	5	5	.....
Rhode Island	.....	1	[1]1
Connecticut	8	7	1
Middle states	18	17	1
New York	15	16	[1]1
New Jersey	1	.....	1
Pennsylvania	1	1	.....
Maryland	1	.....	1
Southern states	2	3	[1]1
Florida	2	3	[1]1
Central states	37	24	13
Ohio	5	3	2
Michigan	4	.....	4
Indiana	4	8	[1]4
Illinois	3	1	2
Wisconsin	6	2	4
Minnesota	8	6	2
Iowa	4	4	.....
Missouri	3	.....	3
Western states	3	2	1
North Dakota	1	.....	1
Nebraska	2	1	1
Kansas	.....	1	[1]1
Pacific states	2	.....	2
California	2	.....	2

[1] Decrease.

The greatest increase in number of establishments, 28, was in the New England states, but they were mainly small factories. The Central states show the next greatest increase, 13, the Western states having an increase of 1 and the Middle states of 1.

Table 4 shows the capital invested in 1890 and 1900, with percentages of the total for each decade.

TABLE 4.—CAPITAL: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	$11,671,567	100.0	$4,929,155	100.0	136.8
Land	2,464,141	21.1	324,011	6.6	660.5
Buildings	3,287,110	28.2	1,377,608	27.9	138.6
Machinery, tools, and implements	3,119,703	26.7	1,046,036	21.2	198.2
Cash and sundries	2,800,613	24.0	2,181,500	44.3	28.4

The data in this table show that the percentage of capital invested in land has increased from 6.6 to 21 during the ten years. This discloses the urban location of many of the plants. Capital invested in buildings increased 138.6 per cent, and in machinery, tools, and implements 198.2 per cent.

Of the miscellaneous expenses 1.2 per cent was ror rent of works, 5.7 per cent for taxes, not including internal revenue, 92.7 per cent for rent of offices, insurance, interest, advertising, and other sundries, and four-tenths of 1 per cent for contract work.

The quantity of materials used in a geographical subdivision is governed by the extent of the manufacture there located. The Central states produced the most starch in 1900, and therefore used the most material, or 47 per cent of the total value. The Middle states used 31.9 per cent, and the New England states 15.8 per cent. The remainder, 5.3 per cent, was divided between the Western states and "all other states." The cost of indian corn was 46.9 per cent of the total materials, and of potatoes 12.1 per cent. These are the chief materials of the manufacture.

Of the value of products 13 per cent comprises by-products, including cattle food. (See Table 7.) Of the starch made 76.3 per cent was corn starch, and 14 per cent potato starch. The 9.7 per cent remaining was divided between wheat and root starch.

The total quantity of starch manufactured was 297,803,139 pounds. Of this total, 247,051,744 pounds were made from indian corn, and 50,751,395 pounds from all other materials. The average value per pound of indian corn starch was 2.5 cents, and the average value of all other starches was 3.8 cents per pound.

The reason of the increased value of starches from other sources than indian corn is due to the peculiar properties which these bodies have for special purposes. This is illustrated by the fact that for use in the textile industries potato starch is preferred to that made from indian corn, and a higher price is paid therefor by the manufacturers. Starches from which

tapioca and similar bodies are made bring a higher price on account of the particular uses to which they are put. For laundry purposes, for the manufacture of glucose, and largely for edible purposes the indian corn starch is cheaper and is in almost universal use in the United States.

Excluding glucose, which can not be regarded as a by-product in the manufacture of starch, cattle foods are the principal by-products. The refuse coming from the manufacture of starch from potatoes is of less value than that coming from indian corn, and hence in Maine, which is the principal state for the manufacture of potato starch, there is no by-product mentioned which is used for cattle foods. Observations of the starch factories in Maine bear out this statement. In a large number of them it was found that the pulp was not used for any purpose whatever. The same statement may be made regarding Minnesota, where no cattle food was reported as a by-product.

Table 5 is a summary for starch made from materials other than potatoes, 1900, arranged by states according to rank.

TABLE 5.—STARCH, OTHER THAN POTATO: SUMMARY, BY STATES, 1900.

STATES.	Rank by value of products.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	PRODUCTS.		
				Number.	Salaries.	Average number.	Wages.			Total value.	Starch, value.	All other products, value.
United States	.....	51	$10,880,973	371	$433,869	2,411	$1,007,501	$667,701	$5,034,964	$8,091,539	$6,908,836	$1,182,703
New York	1	7	3,528,605	79	149,169	992	470,090	303,261	1,698,639	2,580,968	1,961,766	619,202
Indiana	2	4	2,872,833	7	7,871	210	89,200	22,676	549,830	989,639	892,330	97,309
Ohio	3	5	2,078,209	31	39,815	199	78,159	84,396	572,168	940,511	858,776	81,735
Iowa	4	4	700,064	35	37,842	327	114,881	59,192	628,814	896,831	818,271	78,560
Connecticut	5	8	377,400	92	57,180	113	40,128	57,366	285,330	591,000	581,000	10,000
Illinois	6	3	169,210	6	7,400	86	52,600	22,528	345,324	542,190	389,590	152,600
Massachusetts	7	5	344,999	21	23,788	65	34,736	28,708	259,652	390,161	389,815	346
Michigan	8	3	252,000	29	28,540	50	15,166	52,181	129,112	267,345	154,428	112,917
Missouri	9	3	24,700	25	33,600	70	19,475	12,020	126,610	230,000	230,000	.....
All other states[1]	.....	9	487,953	46	48,664	299	93,066	25,373	443,985	662,894	632,860	30,034

[1] Includes establishments distributed as follows: California, 2; Florida, 2; Maryland, 1; Nebraska, 2; New Jersey, 1; Pennsylvania, 1.

Table 6 is a summary for potato starch, 1900, arranged by states according to rank.

TABLE 6.—POTATO STARCH: SUMMARY, BY STATES, 1900.

STATES.	Rank by value of products.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	MATERIALS USED.				PRODUCTS.			
				Number.	Salaries.	Average number.	Wages.		Total cost.	Potatoes.		All other materials, cost.	Total value.	Potato starch.		All other products, value.
										Pounds.	Cost.			Pounds.	Value.	
United States	.....	73	$840,594	35	$17,465	244	$92,195	$32,576	$771,458	237,141,445	$699,808	$71,650	$1,141,445	33,941,826	$1,129,129	$12,316
Maine	1	45	344,349	17	3,475	111	34,824	9,176	358,716	101,875,200	339,584	19,132	555,576	15,273,633	544,760	10,816
Minnesota	2	8	209,274	5	2,780	57	23,287	10,570	250,594	84,617,200	221,779	28,815	329,566	10,882,333	329,566	.....
Wisconsin	3	6	93,250	7	4,020	34	15,267	9,999	100,719	35,441,765	88,250	12,469	154,030	5,043,060	154,030	.....
New Hampshire	4	4	8,100	.....	.....	4	1,465	425	14,387	3,380,080	13,422	965	18,500	520,000	18,500	.....
All other states[1]	.....	10	185,621	6	7,190	38	17,352	2,406	47,042	11,827,200	36,773	10,269	83,773	2,222,800	82,273	1,500

[1] Includes establishments distributed as follows: Michigan, 1; New York, 8; North Dakota, 1.

HISTORICAL AND DESCRIPTIVE.

Starch is one of the principal components of all cereal grains, and of certain root crops, such as the potato, the sweet potato, the cassava, and others. The most important uses of starch are, first, in the laundry; second, for the manufacture of glucose; third, for edible purposes; and fourth, for use in the textile industries. The principal commercial sources of starch are the cereals and potatoes. In the United States indian corn is the principal cereal employed in making starch for commercial purposes. The only other cereal which is used to any extent is wheat, and the use of this cereal is extremely limited. A large number of establishments in the United States also produce starch from potatoes, but in a very small way. Practically five-sixths of the commercial starch of the United States is derived from indian corn. In Europe the principal source of starch is the potato, and this tuber is used very extensively both on the Continent and in England for this purpose. In tropical countries considerable quantities of starch are made from the different varieties of the cassava, and this industry has lately been introduced into the United States, since cassava grows

well in Florida and some other southern parts of the United States. The starch made from the varieties of the cassava is used either as indicated above or for the manufacture of the food product known as tapioca.

The methods of manufacturing starch used either for pure starch, on the one hand, or the manufacture of glucose on the other, is as follows: Grades of indian corn numbers 2, 3, and 4, and grains of no grades are used, but chiefly number 2. The corn is bought shelled in the open market. Cobs and leaves are removed by means of an inclined mechanically shaken sieve through which the grain passes; dirt and fine dust are removed by fans; and nails and other iron scraps are removed by magnets. Large tanks made of wood, iron, or copper, with a capacity of about 1,000 bushels, are used for steeping or softening the corn. Water charged with three-tenths of 1 per cent of SO_2 (sulphurous acid) and heated to 125° F. is used for the softening of the grain; the water is circulated from the bottom to the top by means of a steam injector, and from twenty-four to thirty-six hours are required to complete the steeping. The soft, warm grains are ground or "cracked" with ordinary 4½-foot French burr mills; the grinding being only carried far enough to loosen the germ, and not break it. The "cracked" mass is threshed three times in order to complete the loosening of the germ. The thresher is a box containing 2 circular shafts, fitted with blunt steel arms, making from 1,500 to 2,000 revolutions per minute. The threshed mass is passed between rubber-faced rolls, and the excess of starch liquor is removed from the germ, etc. The wringer is an ordinary five-roller laundry wringer carrying an endless steel gauge belt between the rolls. Technically they are known as "slop machines."

The semidried mass is fed into the "germ separators," where, in consequence of the difference in specific gravity between the germ and shells, the germ floats and the shells sink in a starch solution of 8.5° Baumé. The germ and some starch liquor overflow at one end and at the top of the separator, and the shells and a little more starch liquor are removed from the bottom by a motor pump. To facilitate the removal of the germ, paddles or sweeps drag the germs to the point of overflow and a screw-conveyor form of agitator in the bottom of the separator does the same for the shells. The separator is much like a masse-cuite mixer. It is filled and kept filled with 8.5° Baumé starch liquor.

From the separators the germ and the starch liquor are fed upon a great many copper sieves or "shakers," where the starch liquor is removed from the germs and the germ is freed from adhering starch by washing with water. The shakers are set at a slight angle and are given about 400 lateral throws of 1½ inches per minute. The shaker bottom is covered with a perforated sheet of copper. The washing water comes from small V-shaped troughs running crosswise of the shakers and having their sides perforated.

The germ is put into large sacks or cloths of coarse mesh and subjected to a pressure from a hydraulic press. From this press the germ enters a revolving steam-heated dryer, much like a sugar granulator, and all but 3 per cent of the moisture is removed. A suction fan removes any dust or light particles. The dried germ is run into aspirators, where the shell and points of the germ are removed by fans and screens, and after cooling it is fed to a five-roller shell mill, where it is ground to a fine meal. The mills are of the regular linseed-mill pattern, with one roll set over the other. After grinding, the germ or meal is fed into a double-bottom steam heater or cooker, and from this into another, and at the same time a small jet of steam plays on it as it is moved about by the agitators, in order to supply the required moisture. The meal is heated until it is just bearable to the hand.

The heated meal is fed from the bottom of the cooker into a form; this form in turn drops the meal on a cotton cloth, and the attendant folds over the ends of the cloth, and by means of a piston driven by steam, forms and compresses the cake. The formed cake is slipped between the plates of a regular oil press holding 16 cakes. A hydraulic pressure of 4,000 pounds to the square inch removes 90 per cent of the oil. The oil is filter-pressed through cloth or paper and allowed to settle in large iron tanks for several days. After this it is barreled and is sold in this form of package. The oil cake containing 10 per cent of oil is sold as a cattle food, principally in Europe.

The shells and other unground parts that are removed from the bottom of the germ separator are called the "first grind." From the separators this is fed upon rapidly oscillating silk sieves or shakers. Here the mass is drained, the starch liquor passing through the silk and going to the starch supply tank. The drained first grind is fed into a second net of burr mills, when the starch adhering to the shells is removed as far as practicable.

The feed or second grind is fed upon silk sieves or shakers. The first half of the shake simply drains the starch from the second grind without any washing. These drainings are also sent to the starch-supply tank and are washed five times in passing over the second or last half of the shakers in order to remove all adhering starch. The feed passes through a set of wringers for the final removal of any free starch. It is then mixed with the solids from the "steep water," and the gluten is pumped into large presses, where 45 per cent of the adhering moisture is removed. These presses are very large, carrying 100 plates, and are operated by hydraulic pressure.

The feed after being broken by threshers is carried into large steam dryers, where the moisture is reduced to 20 per cent. After again passing through threshers it is conveyed into the finishing dryers, where all but about 10 per cent of moisture is removed. It is then ground

to a fine meal by food attrition mills, which have two flat disks revolving in opposite directions at a speed of 2,000 revolutions per minute. The disks have little square pockets, one-fourth by 1 inch and one-fourth inch deep, giving an enormous cutting surface. The feed is sold as gluten, buffalo-maize, and golden feed, and is one of the well-known concentrated cattle feeds in the market.

The washings of the second grind on the second shakers that are very dilute are run into cone settlers, where the excess of water is removed and the concentrated starch liquor is sent to the starch-supply tank. These cone settlers are circular iron tanks, with cone bottoms, and are about 12 feet deep. The starch enters a 10-inch pipe, extending from the top to within 36 inches of the bottom. The point of the cone has a one-half-inch outlet for removing the starch. The water overflows at the top of the tank. By this arrangement the settling and drawing off of the water and starch are continuous. The accumulated starch liquors are collected in the supply tank from all parts of the house, after being run upon a set of silk shakers carrying a very fine mesh silk, known as No. 20. These shakers remove the finer particles of feed, etc.

From the shakers the starch is fed in small streams to the starch tables, where the starch settles and the gluten runs off at the end of the table. The tables are long gutters, 20 inches wide, 9 inches deep, and 100 feet long, with a fall of about 4 inches in that length. When the tables are filled sufficiently the starch is scraped with rubber-edged scrapers and is shoveled upon carriers. These carriers empty into large 12-foot tubs or "breakers," where the starch is mixed with enough water to make a solution weighing either 24° Baume', or 6° Baumé. The 6° starch is again passed over No. 20 shakers and is then run on another set of tables to remove any adhering gluten or other impurities carried off by the water. After scraping, or rubbing and draining, the starch is removed from the tables by carriers.

From the carriers the starch is fed into breakers or threshers, and, after being broken into pieces the size of a hen's egg, it is loaded into shallow canvas-bottom trays. These trays are put on a wagon and the wagon run into kilns. These wagons are run on tracks, and are fitted with racks to hold 14 trays equaling 1 bag of starch, or 300 pounds. The starch remains in the kiln twelve hours, and is gradually moved from the air outlet end of the kiln to the hot air inlet end. These kilns are narrow tunnels holding 16 cars; a temperature of 140° is maintained, and the heated air enters at one end and is drawn out at the other. The starch, containing about 10 per cent of moisture, is powdered either by rolls or beaters and then passed through silk-bolting machines. Pearl starch is that which is not milled after drying but is sold in small masses of a pseudo-crystalline structure. The starch before sending to market is either sacked or barreled.

Twenty-four Degree or Glucose Starch.—The 24° Baumé starch is pumped into the refinery breakers, where it is mixed with one-fourth of 1 per cent concentrated muriatic acid, and is pumped into the converters. The converters are horizontal copper cylinders, 6 by 20 feet, holding 2,000 gallons of starch liquor. A perforated steam coil is in the bottom of the converter and a similar perforated pipe in the top is the inlet for the starch. Before pumping in the starch the steam coil is covered with an acidified water which is brought to a boil. The starch is pumped in, just fast enough not to cool the water below the boiling point, under a pressure of 20 pounds to the square inch. When all of the starch is in the converter the pressure is raised to 35 pounds, and is held at this for twelve minutes, or until the desired sodine test for glucose containing 55 per cent of dextrose is obtained. For acme sugar containing 85 per cent of dextrose the starch is diluted to 14° Baumé and held at a pressure of 45 pounds for forty-five minutes. For brewing sugar containing 93 per cent of dextrose the starch is diluted to 18° Baumé and held at a pressure of 40 pounds for twenty minutes.

The conversions are forced into blow-up tubs, which are large open tubs for relieving the pressure on the converters. From these tubs it flows into neutralizers, where all but 0.015 per cent of the acidity is neutralized with soda ash. From the neutralizers the liquor enters settling tanks for the removal of the coagulated gluten and fibrous matter or it is pumped into regular sugar presses at once.

The liquors from the presses are passed over or through boneblack until all of the color is removed. These filters are horizontal cylinders, 20 by 6 feet, filled with animal black. The liquor enters at the top and is drawn out at the bottom. The filters will usually run from fifteen to eighteen hours. From the filters the liquor is drawn into vacuum pans and is evaporated under 27° to 30° Baumé. From the vacuum pans the liquor is passed through another set of black filters to remove the color that has been generated in the evaporation. These filters are like the first filters, but contain freshly burned black and are only run four hours. After this liquor has exhausted the black it is used for light liquors. From the filters the liquor is drawn into the finishing pan and evaporated to the required density. For glucose either 41°, 42°, 43°, 44°, or 45° Baumé are required. For 70 sugar 41° and for acme or 80 sugar 45° Baumé are required. All weighings are made at 100° F. The pans are regular sugar vacuum pans holding about 63 pounds of glucose.

The glucose from the pans is run into cone-bottom iron tanks fitted with cooling pipes. After cooling the glucose to 100° F., a little bisulphite of soda is added to prevent fermentation, and a little aniline violet to neutralize any tinge of yellow. The glucose is drawn into barrels, and sold at 1 to 1½ cents per pound.

The sugar from the vacuum pans in the case of 70 sugar is drawn into a cooler, and to it are added several buckets of previously crystallized sugar. In this way crystallization is induced. The sugar is then drawn into barrels or pans, where it crystallizes and becomes solid in eighteen hours at normal temperature. The acme is handled in the same manner, but is all crystallized in pans in a room heated to 115° F. Thirty-six hours are required for the acme crystallization, and then thirty-six hours more in a cold room for curing. The panned sugar is chopped and sold in bags. Anhydrous sugar is handled much in the same way as the other, only that the starch is diluted to 1½° Baumé and the plextrose is carried to the maximum. The crystallization is done in cones or forms in a hot room. The cones are made to fit a centrifugal, in which the sugar is freed from adhering sirup. The sugar is shaved and air-dried for several days, and is sold in barrels at 4½ to 5½ cents per pound.

The so-called gluten drawn from the tabled starch is first settled for five hours in wooden tubs, and then the concentrated mass is further concentrated in cone settlers. It is then mixed with the feed and sent to the presses. The steep water from the steeps is first acidified with sulphuric acid to remove the sulphurous acid. It is evaporated to 10° Baumé and neutralized with milk of lime. The precipitate formed is removed by filter presses. The liquor is then evaporated to 30° Baumé and again mixed with the lime precipitate. It is then mixed with the pressed feed.

In the above description no attempt has been made to go into the details of the manufacture, but simply to give the general principles which are followed. In different factories different details of manufacture would be found, but in general the large factories making indian corn starch follow essentially the methods given above.

Starch from Potatoes.—The principles underlying the manufacture of starch from the potato are very simple in their mechanical application. The problem is very much less complicated than in the case of indian corn, since there are no by-products which are worth saving except the pulp, hence no apparatus is necessary for the removal of the outer hull or of the germ. Potatoes of all sizes are used, but chiefly what is known as the culls or immature tubers, or those which are injured in digging and are unsuitable for sending to the market for food purposes. The state of the markets is usually such that there is more profit in selling well-formed and mature potatoes of good size for direct consumption than there is in sending them to the starch factories.

Usually when the price of good, marketable potatoes approaches $1 per barrel, farmers find it more profitable to sell for direct consumption. In a personal inspection of the potato-starch industry in Aroostook county, Maine, made by the author in 1899, potatoes fit for consumption on the table were selling for a dollar a bushel, while the starch manufacturers were paying only from 30 cents to 60 cents per bushel for potatoes used in the manufacture of starch. It is evident that the quantity of starch in such potatoes is very much inferior to that in the merchantable potatoes sold at a higher price. The yield of commercial starch varies from 10 to 16 per cent of the weight of the potatoes used, according to the character and grade of the raw material employed. In Germany potatoes particularly rich in starch are grown especially for starch making. It is not a matter of wonder, therefore, that the yield of starch from the American factories is lower than from the German factories for the same weight of potatoes.

The process of manufacture of potato starch is very simple; in fact the housewife can make a very good potato starch by rasping the potato on a piece of sheet iron punctured with numerous holes by an ordinary awl, throwing the pulp upon a fine cloth and washing the starch through with a stream of water.

A complete study of the potato as a source of starch making, and the details of manufacture, are discussed in Bulletin No. 58 of the United States Department of Agriculture, Bureau of Chemistry.

Table 7 is a detailed summary for the entire starch manufacture, 1900, by states.

TABLE 7.—STARCH: DETAILED

		United States.	Connecticut.	Illinois.	Indiana.	Iowa.	Maine.
1	Number of establishments	124	8	3	4	4	45
	Character of organization:						
2	Individual	50	4	1	1	.....	30
3	Firm and limited partnership	29	1	.....	1	.....	11
4	Incorporated company	45	3	2	2	4	4
	Capital:						
5	Total	$11,671,567	$377,400	$169,210	$2,872,333	$700,064	$344,349
6	Land	$2,464,141	$19,900	$2,600	$806,500	$30,000	$23,530
7	Buildings	$3,287,110	$21,950	$30,000	$493,925	$225,000	$150,750
8	Machinery, tools, and implements	$3,119,703	$157,845	$103,600	$1,294,034	$205,284	$71,365
9	Cash and sundries	$2,800,613	$177,705	$33,010	$278,374	$239,880	$98,704
10	Proprietors and firm members	109	7	1	2	.....	46
	Salaried officials, clerks, etc.:						
11	Total number	406	92	6	7	35	17
12	Total salaries	$451,334	$57,180	$7,400	$7,871	$37,842	$8,475
	Officers of corporations—						
13	Number	44	4	3	2	4	1
14	Salaries	$104,589	$4,000	$5,800	$5,664	$6,394	$750
	General superintendents, managers, clerks, etc.—						
15	Total number	362	88	3	5	31	16
16	Total salaries	$346,745	$53,180	$1,600	$2,207	$31,448	$2,725
	Men—						
17	Number	318	87	2	4	27	16
18	Salaries	$329,684	$52,580	$1,200	$2,087	$29,683	$2,725
	Women—						
19	Number	44	1	1	1	4	.....
20	Salaries	$17,061	$600	$400	$120	$1,765	.....
	Wage-earners, including pieceworkers, and total wages:						
21	Greatest number employed at any one time during the year	3,667	136	128	239	364	506
22	Least number employed at any one time during the year	2,648	107	56	192	300	452
23	Average number	2,655	113	86	210	327	111
24	Wages	$1,099,696	$40,128	$52,600	$89,200	$114,881	$34,824
	Men, 16 years and over—						
25	Average number	2,088	106	64	174	248	111
26	Wages	$986,852	$37,838	$46,100	$82,735	$97,050	$34,824
	Women, 16 years and over—						
27	Average number	535	5	17	36	77	.....
28	Wages	$107,720	$1,990	$5,000	$6,465	$17,331	.....
	Children, under 16 years—						
29	Average number	32	2	5	.....	2	.....
30	Wages	$5,124	$300	$1,500	.....	$500	.....
	Average number of wage-earners, including pieceworkers, employed during each month:[1]						
	Men, 16 years and over—						
31	January	1,820	98	2	162	240	22
32	February	1,864	97	2	168	245	33
33	March	2,020	99	102	178	236	33
34	April	2,110	100	102	177	246	21
35	May	2,102	99	102	177	242	20
36	June	1,888	101	102	166	237	20
37	July	1,851	118	32	170	257	16
38	August	1,868	114	42	171	261	5
39	September	2,533	112	62	173	257	455
40	October	2,628	110	72	176	253	480
41	November	2,371	115	76	182	254	222
42	December	2,001	109	72	188	248	9
	Women, 16 years and over—						
43	January	554	5	.....	35	85	.....
44	February	543	5	.....	34	78	.....
45	March	560	5	20	35	80	.....
46	April	554	5	20	33	79	.....
47	May	549	5	20	34	81	.....
48	June	561	5	20	38	74	.....
49	July	523	5	20	36	76	.....
50	August	521	5	20	34	79	.....
51	September	597	5	20	37	77	.....
52	October	475	5	20	39	74	.....
53	November	464	5	20	39	75	.....
54	December	519	5	24	39	75	.....
	Miscellaneous expenses:						
55	Total	$700,277	$57,866	$22,528	$22,676	$59,192	$9,176
56	Rent of works	$8,362	$1,180	$360	$182	$180	$300
57	Taxes, not including internal revenue	$40,145	$1,576	$268	$3,004	$2,375	$2,216
58	Rent of offices, insurance, interest, and all sundry expenses not hitherto included.	$649,382	$52,222	$21,900	$19,540	$56,637	$6,660
59	Contract work	$2,388	$2,388	.....	.....	.....	.....
	Materials used:						
60	Aggregate cost	$5,806,422	$285,830	$345,324	$549,830	$623,814	$358,716
	Principal materials—						
61	Total cost	$4,403,650	$227,390	$330,200	$445,883	$418,621	$339,584
62	Corn, pounds	462,213,456	.....	45,660,000	72,676,464	89,266,016	.....
63	Cost	$2,723,241	.....	$324,000	$442,689	$396,452	.....
64	Wheat, pounds	667,620	.....	480,000	.....	.....	.....
65	Cost	$6,702	.....	$4,500	.....	.....	.....
66	Potatoes, pounds	237,141,445	.....	.....	.....	.....	101,875,200
67	Cost	$699,808	.....	.....	.....	.....	$339,584
68	Roots, pounds	1,092,000	.....	.....	.....	.....	.....
69	Cost	$2,700	.....	.....	.....	.....	.....
70	Corn starch, pounds	28,549,150	10,497,848	85,000	149,162	658,000	.....
71	Cost	$527,378	$221,334	$1,700	$3,194	$16,360	.....
72	Wheat flour, pounds	26,201,896	.....	.....	.....	.....	.....
73	Cost	$417,804	.....	.....	.....	.....	.....
74	Borax, pounds	162,935	66,479	.....	.....	170	.....
75	Cost	$12,335	$5,120	.....	.....	$15	.....
76	Gum, pounds	32,163	3,422	.....	.....	170	.....
77	Cost	$1,823	$802	.....	.....	$21	.....
78	Soda, pounds	696,140	4,890	.....	.....	305,523	.....
79	Cost	$11,859	$134	.....	.....	$5,773	.....
80	Fuel	$200,912	$696	$4,000	$21,703	$97,176	$3,286
81	Rent of power and heat	$21,455	$684	$24	$215	$8	$250
82	Mill supplies	$66,300	$200	$10,005	$1,149	$3,090	$2,118
83	All other materials	$1,011,447	$35,601	$1,095	$80,874	$115,960	$8,467
84	Freight	$102,658	$21,259	.....	$6	$48,959	$21

[1] The average number of children, under 16 years, employed during each month, is not included in the table, because of the small number reported.

SUMMARY, BY STATES, 1900.

Massachusetts.	Michigan.	Minnesota.	Missouri.	New Hampshire.	New York.	Ohio.	Wisconsin.	All other states.[1]	
5	4	8	3	4	15	5	6	10	1
			1	2	6			5	2
			1	2	5		2	1	3
3		2			4	5	4	4	4
2	4	6	1						
$344,999	$408,921	$209,274	$24,700	$8,100	$3,547,305	$2,073,209	$93,250	$497,053	5
$29,320	$74,911	$6,975		$925	$717,180	$705,000	$10,450	$36,850	6
$67,300	$102,188	$55,000		$5,000	$1,072,223	$875,000	$22,000	$166,774	7
$53,271	$132,050	$59,825	$8,700	$1,725	$696,892	$269,703	$36,750	$33,709	8
$195,108	$99,772	$87,474	$21,000	$450	$1,061,010	$223,506	$24,050	$260,620	9
9		6	3	7	17		4	7	10
21	35	5	25		79	31	7	46	11
$23,788	$35,780	$2,780	$33,600		$149,169	$39,815	$4,020	$48,664	12
					8	2		5	13
5	7	1	2		$37,948	$4,700		$16,869	14
$8,200	$10,800	$464	$3,000						
16	28	4	23		71	29	7	41	15
$15,588	$24,930	$2,316	$30,600		$111,221	$35,115	$4,020	$31,795	16
14	19	4	23		69	26	7	20	17
$14,948	$23,080	$2,316	$30,600		$110,149	$33,501	$4,020	$22,795	18
					2	3		21	19
2	9				$1,072	$1,614		$9,000	20
$640	$1,850								
73	145	156	102	19	1,144	205	82	368	21
59	30	85	65	18	811	189	78	211	22
65	83	57	70	4	996	199	84	300	23
$34,736	$30,166	$23,287	$19,475	$1,465	$471,662	$78,159	$15,267	$93,846	24
58	51	57	19	4	804	157	30	205	25
$32,736	$25,166	$23,287	$10,430	$1,465	$437,322	$67,949	$14,467	$75,483	26
7	32		51		174	39	4	93	27
$2,000	$5,000		$9,045		$32,130	$9,850	$800	$18,109	28
					18	3		2	29
					$2,210	$360		$254	30
60	32		18		815	159	2	210	31
61	33		18		841	158	2	206	32
58	93	3	19		806	158	13	222	33
58	95	73	19		803	158	46	212	34
58	95	73	19		797	154	46	220	35
58	18	7	19		784	156	2	218	36
53	10	7	18		818	157		195	37
50	10	67	19		826	157		146	38
61	24	150	22	10	819	158	42	188	39
61	88	149	18	19	767	157	64	214	40
61	89	136	18	19	752	151	75	221	41
61	30	15	18		826	155	63	207	42
8	50		40		188	32	6	105	43
8	50		40		189	32	6	106	44
6	50		40		185	32	6	101	45
6	50		40		187	37	6	91	46
6	50		55		172	37	6	83	47
8	50		55		177	37	6	91	48
7	10		55		186	43		85	49
7	10		80		189	43		54	50
8	50		80		188	43		89	51
8	3		46		125	43	6	106	52
5	3		40		122	44	6	105	53
9	9		40		175	43	6	98	54
$28,708	$54,056	$10,570	$12,020	$425	$303,643	$84,396	$9,999	$25,522	55
$300			$1,620		$240	$1,930	$420	$1,700	56
$1,996	$768	$1,057		$60	$18,177	$5,488	$889	$2,271	57
$26,412	$53,288	$9,513	$10,400	$365	$285,226	$76,978	$8,690	$21,551	58
									59
$259,652	$161,089	$250,594	$126,610	$14,387	$1,704,054	$572,168	$100,719	$453,685	60
$244,854	$89,302	$221,779	$111,800	$13,422	$1,077,791	$480,212	$88,250	$314,562	61
					162,456,728	59,940,608		32,213,640	62
					$1,040,546	$369,314		$150,240	63
									64
	187,620								65
	$2,202						35,441,765	3,000,000	66
	7,080,000	84,617,200		3,380,080	1,747,200		$88,250	$9,000	67
	$23,000	$221,779		$13,422	$4,773			1,092,000	68
								$2,700	69
								4,898,000	70
$80,000	800,000		6,187,140		350,000	4,544,000		$72,000	71
$6,000	$11,000		$107,300		$10,490	$78,000		5,277,960	72
13,939,464	2,822,400				1,336,340	2,825,732		$77,387	73
$237,654	$53,100				$16,765	$92,898		$7,000	74
10,000			49,286					$3,000	75
$700			$3,500						76
			28,571						77
			$1,000						78
43,478					326,000			16,249	79
$500					$5,217			$235	80
$7,089	$6,011	$8,944	$300	$340	$67,591	$13,900	$2,649	$22,227	81
			$60		$19,904	$130		180	82
$1,040	$4,266	$2,343	$60	$105	$30,320	$4,477	$610	$6,517	83
$6,669	$61,510	$17,324	$14,390	$520	$495,872	$72,449	$8,300	$92,426	84
		$204			$12,576	$1,000	$910	$17,723	

[1] Includes establishments distributed as follows: California, 2; Florida, 2; Maryland, 1; Nebraska, 2; New Jersey, 1; North Dakota, 1; Pennsylvania, 1.

TABLE 7.—STARCH: DETAILED

		United States.	Connecticut.	Illinois.	Indiana.	Iowa.	Maine.
	Products:						
85	Aggregate value	$9,232,984	$591,000	$542,190	$989,639	$896,331	$555,576
	Starch—						
86	Total number of pounds	297,803,139	11,337,368	24,874,000	43,979,000	39,325,047	15,273,633
87	Total value	$8,037,965	$581,000	$389,590	$892,330	$818,271	$544,760
88	Corn starch, pounds	247,051,744	11,337,368	24,470,800	43,979,000	39,325,047	.....
89	Value	$6,133,001	$581,000	$369,390	$892,330	$818,271	.....
90	Wheat starch, pounds	16,064,569	.....	403,200	.....	.....	.....
91	Value	$749,755	.....	$20,200	.....	.....	.....
92	Potato starch, pounds	33,941,826	.....	.....	.....	.....	15,273,633
93	Value	$1,129,129	.....	.....	.....	.....	$544,760
94	Root starch, pounds	745,000	.....	.....	.....	.....	.....
95	Value	$26,080	.....	.....	.....	.....	.....
96	Cattle food, pounds	68,745,819	.....	10,400,000	25,000,000	2,500,000	.....
97	Value	$258,023	.....	$104,000	$58,385	$5,559	.....
98	All other products	$936,996	$10,000	$48,600	$38,924	$73,001	$10,816
	Comparison of products:						
99	Number of establishments reporting for both years	76	7	2	1	3	28
100	Value for census year	$5,497,600	$451,000	$43,440	$973,089	$894,581	$898,810
101	Value for preceding business year	$4,870,205	$472,469	$30,000	$950,000	$824,545	$311,536
	Power:						
102	Number of establishments reporting	114	6	2	3	3	45
103	Total horsepower	11,985	71	851	941	840	1,517
	Owned—						
	Engines—						
104	Steam, number	171	2	7	14	13	48
105	Horsepower	9,810	55	650	933	832	1,414
106	Gas or gasoline, number	2	.....	.....	.....	.....	.....
107	Horsepower	10	.....	.....	.....	.....	.....
108	Water wheels, number	16	.....	.....	.....	.....	2
109	Horsepower	1,595	.....	.....	.....	.....	65
110	Electric motors, number	10	.....	3	.....	1	.....
111	Horsepower	323	.....	200	.....	4	.....
112	Other power, number	11	.....	.....	.....	.....	.....
113	Horsepower	165	.....	.....	.....	.....	.....
114	Rented, horsepower	82	16	1	8	4	33
	Establishments classified by number of persons employed, not including proprietors and firm members:						
115	Total number of establishments	124	8	3	4	4	45
116	No employees	1	.....	.....	.....	.....	.....
117	Under 5	14	3	1	1	1	.....
118	5 to 20	82	2	1	2	1	45
119	21 to 50	11	1	.....	.....	.....	.....
120	51 to 100	7	2	.....	.....	.....	.....
121	101 to 250	6	.....	1	1	1	.....
122	251 to 500	3	.....	.....	.....	1	.....

SUMMARY, BY STATES, 1900—Continued.

Massachusetts.	Michigan.	Minnesota.	Missouri.	New Hampshire.	New York.	Ohio.	Wisconsin.	All other states.[1]	
$390,161	$330,183	$329,566	$230,000	$18,500	$2,589,908	$940,511	$154,080	$674,894	85
8,042,151	4,945,680	10,882,333	6,700,000	520,000	67,652,609	36,301,525	5,048,060	22,926,733	86
$389,815	$215,766	$329,566	$230,000	$18,500	$1,970,701	$858,776	$154,080	$644,860	87
585,960	.....	.....	6,700,000	.....	66,170,869	34,412,450	.....	20,070,250	88
$46,391	.....	.....	$230,000	.....	$1,915,766	$788,213	.....	$496,640	89
7,456,191	3,287,880	.....	.....	.....	616,740	1,889,075	.....	2,411,483	90
$343,424	$154,428	.....	.....	.....	$25,000	$75,563	.....	$131,140	91
.....	1,657,800	10,882,333	.....	520,000	265,000	.....	5,048,060	800,000	92
.....	$61,338	$329,566	.....	$18,500	$8,935	.....	$154,080	$12,000	93
.....	.....	.....	.....	.....	600,000	.....	.....	145,000	94
.....	.....	.....	.....	.....	$21,000	.....	.....	$5,080	95
.....	.....	.....	.....	.....	29,045,819	.....	.....	.....	96
.....	1,800,000	.....	.....	.....	$88,279	.....	.....	.....	97
.....	$1,800	.....	.....	.....	$530,923	$81,735	.....	$30,034	98
$346	$112,617	.....	.....	.....	9	3	.....	7	99
5	.....	6	1	4	$1,126,005	$183,664	.....	$667,384	100
$390,161	.....	$235,966	$115,000	$18,500	$867,862	$152,000	.....	$599,650	101
$365,216	.....	$180,827	$105,000	$11,100	14	4	5	9	102
4	4	8	3	4	4,435	1,063	290	601	103
65	719	461	82	49	28	10	5	14	104
4	8	12	3	3	2,825	910	290	589	105
65	675	461	72	39	.....	.....	.....	2	106
.....	.....	.....	.....	.....	.....	.....	.....	10	107
.....	.....	.....	.....	.....	.....	.....	.....	.....	108
.....	.....	.....	.....	1	13	.....	.....	.....	109
.....	.....	.....	.....	10	1,520	.....	.....	.....	110
.....	5	.....	.....	.....	1	.....	.....	.....	111
.....	44	.....	.....	.....	75	.....	.....	.....	112
.....	.....	.....	.....	.....	1	10	.....	.....	113
.....	.....	.....	.....	.....	15	150	.....	.....	114
.....	.....	.....	10	.....	.....	3	.....	2	115
5	4	8	3	4	15	5	6	10	116
.....	.....	.....	.....	.....	1	.....	.....	.....	117
.....	.....	.....	.....	2	6	.....	.....	.....	118
4	2	6	1	2	3	1	5	7	119
1	.....	2	1	.....	1	2	1	2	120
.....	2	.....	1	.....	.....	2	.....	.....	121
.....	.....	.....	.....	.....	2	.....	.....	1	122
.....	.....	.....	.....	.....	2	.....	.....	.....	

[1] Includes establishments distributed as follows: California, 2; Florida, 2; Maryland, 1; Nebraska, 2; New Jersey, 1; North Dakota, 1; Pennsylvania, 1.

COTTONSEED PRODUCTS.

COTTONSEED PRODUCTS.

By DANIEL C. ROPER, *Expert Special Agent.*

Reports have been received from 357 establishments engaged in the manufacture of cottonseed products during the census year ending May 31, 1900. These establishments are located in 15 different states and territories, but it is impossible to publish separate totals for 4 of these states without disclosing the operations of individual establishments. The statistics for these 4 states are therefore grouped under the head of "all other states" in the tables of this report, and include establishments distributed as follows: Florida, 1; Kansas, 1; Missouri, 2; and Illinois, 1.

Table 1 shows by states and territories and for the United States the number of establishments, the quantity and cost of cottonseed crushed for oil extraction, and the quantity and value of each of the products, together with the total value of all products.

TABLE 1.—NUMBER OF ESTABLISHMENTS, QUANTITY, COST, AND AVERAGE COST PER TON OF COTTONSEED CRUSHED; AND QUANTITY, VALUE, AND AVERAGE VALUE PER UNIT OF PRODUCTS MANUFACTURED: 1900.

STATES AND TERRITORIES.	Number of establishments.	COTTONSEED.			PRODUCTS.			
		Tons.	Cost.	Average cost per ton.	Total value.	Oil.		
						Gallons.	Value.	Average value per gallon.
								Cents.
United States	357	2,479,386	$28,682,616	$11.55	$42,411,835	93,325,729	$21,390,674	22.9
Alabama	27	172,093	2,019,085	11.73	2,952,254	6,704,951	1,520,834	22.7
Arkansas	20	190,015	2,245,710	11.82	3,188,812	7,224,971	1,644,465	22.8
Georgia	46	271,833	3,246,814	11.94	4,787,100	10,606,693	2,468,386	23.3
Indian Territory	6	26,415	297,939	11.28	446,078	931,885	207,251	22.2
Louisiana	21	250,983	2,833,767	11.29	4,397,891	9,692,640	2,222,762	22.9
Mississippi	41	394,678	4,577,995	11.60	6,671,031	15,033,565	3,364,278	22.4
North Carolina	20	107,660	1,313,663	12.20	1,880,015	4,388,277	979,637	22.3
Oklahoma	6	26,425	247,520	9.37	410,063	937,021	186,761	19.9
South Carolina	48	156,642	2,186,408	13.96	3,043,547	6,162,218	1,545,934	25.1
Tennessee	15	168,307	1,848,829	10.98	2,737,038	6,454,173	1,363,555	21.1
Texas	102	692,604	7,560,661	10.92	11,519,656	24,354,695	5,696,263	23.4
All other states[1]	5	21,731	254,225	11.70	378,350	834,640	190,548	22.8

STATES AND TERRITORIES.	PRODUCTS—continued.								
	Cake and meal.			Hulls.			Linters.		
	Tons.	Value.	Average value per ton.	Tons.	Value.	Average value per ton.	Pounds.	Value.	Average value per pound.
									Cents.
United States	884,391	$16,030,576	$18.13	1,169,286	$3,189,354	$2.73	57,272,053	$1,801,231	3.1
Alabama	60,389	1,076,150	17.82	80,167	217,925	2.72	4,331,016	137,345	3.2
Arkansas	65,459	1,142,102	17.45	90,683	248,770	2.74	4,613,519	153,475	3.3
Georgia	91,637	1,713,038	18.69	132,344	405,581	3.06	6,398,830	200,095	3.1
Indian Territory	9,185	182,807	19.90	13,074	32,972	2.52	673,975	23,048	3.4
Louisiana	91,348	1,715,424	18.78	114,446	287,650	2.51	6,133,661	172,055	2.8
Mississippi	141,529	2,618,405	18.50	185,060	396,791	2.14	9,199,737	291,557	3.2
North Carolina	36,088	678,978	18.81	52,139	145,928	2.80	2,149,996	75,477	3.5
Oklahoma	9,481	163,785	17.28	12,424	40,897	3.29	525,550	18,620	3.5
South Carolina	57,986	1,169,645	20.17	71,542	217,886	3.05	3,223,892	110,082	3.4
Tennessee	59,613	1,045,795	17.54	79,858	196,105	2.46	4,058,473	131,583	3.2
Texas	252,983	4,371,377	17.28	328,119	975,489	2.97	15,544,379	476,527	3.1
All other states[1]	8,693	153,075	17.61	9,430	23,360	2.48	419,025	11,367	2.7

[1] Includes establishments distributed as follows: Florida, 1; Kansas, 1; Missouri, 2; Illinois, 1.

The cost of the cottonseed crushed for oil extraction was $28,632,616 and the values of the products were as follows: Oil, $21,390,674; cake and meal, $16,030,576; hulls, $3,189,354; linters, $1,801,231—a total of $42,411,835. The value of the seed was increased 48.1 per cent by the manufacture.

The refining of oil and the manufacture of fertilizers were conducted in connection with oil extraction by a number of the establishments reported in Table 1, but this report does not cover any operation subsequent to the extraction of oil. Statistics of cottonseed oil refining are not included, both because such operations do not come within the proper scope of this report, and because it is impracticable to present statistics of the quantity of oil refined without danger of duplication, owing to the different stages of refinement in which the oil is purchased by different mills. This report, moreover, does not show the capital, wages, and miscellaneous expenses of the establishments, for the reason that it has been impracticable to differentiate the capital, labor, and expenses covering the several industries included in the operations of these establishments so as to present such statistics for oil extraction only. In comparing the statistics of this report with the general statistics of manufacturing industries, it should be remembered that the classification "oil, cottonseed, and cake," in the general statistics, includes, in addition to the industry covered by this report, the refining of cottonseed oil and some manufacturing of fertilizers. The value of products, as given in the general statistics, includes also the value of a considerable quantity of fertilizers manufactured at the oil mills by combining cottonseed meal with phosphate rock. The statistics of mills which crush cottonseed for use as a fertilizer without extracting oil are not included in this report, but are included in the general tables of manufactures under the classification "fertilizers."

Among the economic developments which have characterized the industrial progress of the United States during the past quarter of a century, none has attracted more attention and brought about more desirable results than the manufacture of cottonseed products. In the Mississippi Valley and other sections of the country where fertilizers were not required for replenishing the soil, the disposal of cottonseed gave the ginner and the community great concern prior to 1860. The seed was usually hauled to a remote place to rot, or dumped into some convenient stream of running water. With the growth of population and increase in cotton culture this careless method of disposal often became a great nuisance. In this connection the following extract from one of the laws of Mississippi is interesting history:

ARTICLE 18. Every owner or proprietor of any cotton gin erected within half a mile of any city, town, or village is hereby required to remove or destroy all cottonseed which may fall from such gin, so that the same shall not prejudice the health of the inhabitants of such city, town, or village; and every person being an owner or proprietor of a cotton gin situate as aforesaid, who shall neglect or refuse to remove or destroy the cottonseed in and about such gin, having received five days' notice, shall forfeit and pay the sum of $20 for every day he or she shall neglect or refuse to remove or destroy the cottonseed as aforesaid, to be recovered by warrant in the name of the state before any justice of the peace of the proper county for the use and benefit of said county.

ARTICLE 19. No person who shall be the owner or proprietor of any cotton gin shall be authorized to throw or permit to be thrown the cottonseed from such gin into any river, creek, or other stream of water which may be used by the inhabitants for drinking or fishing therein; and any person offending herein shall forfeit and pay for every such offense the sum of $200, to be recovered in any court of competent jurisdiction, by action of debt or information in the name of any person who will sue for the same, one moiety thereof to such person and the other moiety to the county in which the offense is committed.[1]

The low commercial rating of cottonseed so vividly indicated in this law was current in these localities until the introduction of the intensive system of cotton farming, which is practically coeval with the introduction of the cottonseed-oil mill; although, in localities where the soil required replenishing, a few thrifty farmers early began the use of the seed as a fertilizer. In its early use as a fertilizer the seed was made into a compost, or exposed to the weather for a sufficient time to destroy the germ life. While in many localities these methods are still in vogue, yet the more general plan is to destroy the germ life by crushing the seed. This manner of using cottonseed was found to involve great waste, when it was discovered that through the manipulations of the oil mills all of the value of the seed as a fertilizer was retained, and at the same time it was, through its by-products, made to contribute marvelously to the general economy of wealth. The result is that from a product that was deemed a nuisance in 1857 there was produced in 1900 a value of $42,411,835, and only 53.1 per cent of the available raw material was utilized.

Table 2 shows by states and territories and for the United States the number of establishments, the average consumption of cottonseed per establishment, the average quantity and value of the several products manufactured from one ton of seed, and the per cent that each is of the total weight and value.

[1] Revised Code of Mississippi: 1857, page 207.

TABLE 2.—NUMBER OF ESTABLISHMENTS, AVERAGE CONSUMPTION OF SEED, AVERAGE PRODUCTION PER TON OF SEED, AND PER CENT OF EACH TO TOTAL: 1900.

STATES AND TERRITORIES.	Number of establishments.	Average consumption of seed per establishment.	PRODUCTS. Average per ton of seed. Quantity. Oil.	Cake and meal.	Hulls.	Linters.	Waste.	Value. Total.	Oil.	Cake and meal.
United States	357	*Tons.* 6,945	*Gallons.* 37.6	*Pounds.* 713	*Pounds.* 943	*Pounds.* 23	*Pounds.* 39	$17.11	$8.63	$6.46
Alabama	27	6,374	39.0	702	932	25	48	17.15	8.84	6.25
Arkansas	20	9,501	38.0	689	954	24	48	16.78	8.65	6.01
Georgia	46	5,909	39.0	674	974	24	35	17.61	9.08	6.30
Indian Territory	6	4,403	35.3	695	990	26	24	16.89	7.85	6.92
Louisiana	21	11,952	38.6	728	912	24	46	17.52	8.86	6.83
Mississippi	41	9,626	38.1	717	938	23	37	16.90	8.52	6.63
North Carolina	20	5,383	40.8	670	969	20	35	17.46	9.10	6.31
Oklahoma	6	4,404	35.5	718	940	20	56	15.52	7.07	6.20
South Carolina	48	3,263	39.3	740	913	21	31	19.43	9.87	7.47
Tennessee	15	11,220	38.4	708	949	24	31	16.26	8.10	6.21
Texas	102	6,790	35.2	731	947	22	36	16.63	8.22	6.31
All other states[1]	5	4,346	38.4	800	868	19	25	17.41	8.77	7.04

STATES AND TERRITORIES.	PRODUCTS—continued. Average per ton of seed—Continued. Value—Continued. Hulls.	Linters.	Per cent of each to total. Weight. Oil.[2]	Cake and meal.	Hulls.	Linters.	Waste.	Value. Oil.	Cake and meal.	Hulls.	Linters.
United States	$1.29	$0.73	14.1	35.6	47.1	1.2	2.0	50.4	37.8	7.5	4.3
Alabama	1.26	0.80	14.6	35.1	46.6	1.3	2.4	51.5	36.4	7.4	4.7
Arkansas	1.31	0.81	14.3	34.4	47.7	1.2	2.4	51.6	35.8	7.8	4.8
Georgia	1.49	0.74	14.6	33.7	48.7	1.2	1.8	51.6	35.8	8.4	4.2
Indian Territory	1.25	0.87	13.2	34.8	49.5	1.3	1.2	46.6	41.0	7.4	5.1
Louisiana	1.14	0.69	14.5	36.4	45.6	1.2	2.3	50.6	39.0	6.5	3.9
Mississippi	1.01	0.74	14.3	35.8	46.9	1.1	1.9	50.4	39.2	6.0	4.4
North Carolina	1.35	0.70	15.3	33.5	48.5	1.0	1.7	52.1	36.2	7.7	4.0
Oklahoma	1.55	0.70	13.3	35.9	47.0	1.0	2.8	45.5	40.0	10.0	4.5
South Carolina	1.39	0.70	14.7	37.0	45.6	1.1	1.6	50.8	38.4	7.2	3.6
Tennessee	1.17	0.78	14.4	35.4	47.4	1.2	1.6	49.8	38.2	7.2	4.8
Texas	1.41	0.69	13.2	36.6	47.3	1.1	1.8	49.4	38.0	8.5	4.1
All other states[1]	1.08	0.52	14.4	40.0	43.4	1.0	1.2	50.4	40.4	6.2	3.0

[1] Includes establisments distributed as follows: Florida, 1; Kansas, 1; Missouri, 2; Illinois, 1.
[2] Estimated on the basis of 7.5 pounds per gallon.

At the census of 1870 but 26 cottonseed-oil mills were reported. The number increased to 45 in 1880, 119 in 1890, and 357 in 1900; an increase of 73.1 per cent between 1870 and 1880; 164.4 per cent between 1880 and 1890; and 200 per cent between 1890 and 1900. But it should be noted that the censuses prior to 1900 included all establishments engaged in refining cottonseed oil, while, as previously explained, this report includes only such establishments as are engaged in extracting the oil; accordingly, the figures given above are probably not quite correct as regards the increase between 1890 and 1900.

The general average consumption of seed per establishment for the season covered by the census year was 6,945 tons.

Table 2 shows the average quantity of products per ton of seed for the United States in 1900, as follows: Crude oil, 37.6 gallons (equivalent to 282 pounds); cake and meal, 713 pounds; hulls, 943 pounds; linters, 23 pounds; and waste, 39 pounds.

Table 3 is a statement of the number of gallons of cottonseed oil exported from 1870 to 1901, inclusive, together with the total value and the average value per gallon.

TABLE 3.—EXPORTS OF COTTONSEED OIL, 1870 TO 1901.[1]

YEAR.	Gallons.	Value.[2]	Average value per gallon.	YEAR.	Gallons.	Value.[2]	Average value per gallon.
			Cents.				Cents.
1870	([3])	$14,946		1886	6,240,139	$2,115,974	33.9
1871	([3])	140,577		1887	4,067,138	1,578,935	38.8
1872	547,165	293,546	53.6	1888	4,458,597	1,925,739	43.2
1873	709,576	370,506	52.2	1889	2,690,700	1,298,609	48.3
1874	782,067	372,327	47.6	1890	13,384,385	5,291,178	39.5
1875	417,387	216,640	51.9	1891	11,003,160	3,975,305	36.1
1876	281,054	146,135	52.0	1892	13,859,278	4,982,285	36.0
1877	1,705,422	842,248	49.4	1893	9,462,074	3,927,556	41.5
1878	4,992,349	2,514,323	50.4	1894	14,958,309	6,008,405	40.2
1879	5,352,530	2,232,880	41.7	1895	21,187,728	6,813,318	32.2
1880	6,997,796	3,225,414	46.1	1896	19,445,848	5,476,510	28.2
1881	8,444,084	1,465,255	42.5	1897	27,198,882	6,897,361	25.4
1882	713,549	330,260	46.3	1898	40,230,784	10,137,619	25.2
1883	415,611	216,779	52.1	1899	50,627,219	12,077,519	23.9
1884	3,605,946	1,570,871	43.6	1900	46,902,390	14,127,538	30.1
1885	6,364,279	2,614,592	41.1	1901	49,356,741	16,541,321	33.5

[1] Commerce and Navigation of the United States.
[2] The value of cottonseed oil, at the time of exportation, in the ports of the United States whence exported.
[3] Quantity not stated.

The first cottonseed-oil mill in the United States was erected at Natchez, Miss., in 1834, but the industry did not acquire commercial importance until after the Civil War. In fact, the history of the industry prior to 1870 records more of failure than success. The quantity of cottonseed crushed and the resulting products were not reported prior to the present census. It is therefore impossible to trace the growth of this industry statistically, except in so far as it is indicated by the exports which are presented in Table 3. In the earlier years of its manufacture, cottonseed oil was almost entirely exported to foreign countries, and export figures for those years, therefore, represent very nearly the production of the country. The export of cottonseed oil in 1872 was 547,165 gallons, and it is estimated that approximately 3 per cent of the cottonseed produced in that year was required for the production of this quantity of oil. The export in 1880 was 6,997,796 gallons, and represented a consumption of 20 per cent of the seed produced in that year. It would not be safe to estimate on this basis for 1890, as by that time the home consumption of cottonseed oil had become an important factor. The export of cottonseed oil in 1900 was 46,902,390 gallons, which constituted 50.2 per cent of the total production for that year.

Table 3 further shows that in 1872 and 1899 cottonseed oil reached its maximum and minimum prices, commanding in the former year 53.6 cents, and in the latter 23.9 cents per gallon in the ports from which it was exported. The low price in 1879 was due to the large quantities of oil obtained from the seed crops of 1878 and 1879. The increase in the production from 281,054 gallons in 1876 to 5,352,530 gallons in 1879 was much in excess of the supply required for the limited field in which it was then utilized. About this time, however, it was discovered that cottonseed oil could be advantageously combined with beef fat to make a substitute for lard. Then followed the further discoveries that this oil could be utilized in packing American sardines and, in combination with other substances, in making artificial butter. This increased the demand and gave a permanent stimulus to the industry.

Table 4 is a statement of the quantity and value of cottonseed oil exported to each country.

TABLE 4.—DESTINATIONS OF COTTONSEED OIL EXPORTED DURING THE YEAR ENDING JUNE 30, 1900.[1]

COUNTRIES.	COTTONSEED OIL.		COUNTRIES.	COTTONSEED OIL.	
	Gallons.	Value.		Gallons	Value.
Total	46,902,390	$14,127,538	*North America*—Continued.		
Europe.			Central American states:		
Austria-Hungary	4,824,560	1,448,571	Costa Rica	1,996	$861
Belgium	1,914,502	591,747	Guatemala	303	112
Denmark	487,835	143,779	Honduras	1,778	591
France	13,595,564	4,075,057	Nicaragua	5,855	2,148
Germany	4,256,573	1,330,240	Salvador	6,743	3,267
Gibraltar	11,250	4,000	Mexico	4,134,679	1,021,613
Italy	2,660,276	874,758	West Indies:		
Malta, Gozo, etc	110,187	36,301	British	269,759	85,640
Netherlands	9,411,170	2,766,774	Cuba	123,961	33,135
Russia, Black Sea	120	40	Danish	7,418	2,530
Sweden and Norway	204,519	56,718	Dutch	1,410	461
United Kingdom	1,585,486	492,100	French	475,503	161,119
North America.			Haiti	431	200
Bermuda	30	13	Porto Rico	15,365	6,639
British Honduras	199	74	Santo Domingo	127,669	54,798
Dominion of Canada:			*South America.*		
Nova Scotia, New Brunswick, etc	1,663	596	Argentina	185,789	55,621
Quebec, Ontario, Manitoba, etc	370,392	113,756	Brazil	766,842	284,936
British Columbia	22	17	Chile	61,081	24,839
Newfoundland and Labrador	30,874	11,641	Colombia	11,821	4,546
			Ecuador	3,261	1,344

[1] Commerce and Navigation of the United States, 1900.

TABLE 4.—DESTINATIONS OF COTTONSEED OIL EXPORTED DURING THE YEAR ENDING JUNE 30, 1900—Continued.

COUNTRIES.	COTTONSEED OIL.	
	Gallons.	Value.
South America—Continued.		
Guianas:		
British	75,234	$26,177
Dutch	53	22
French	5,200	1,957
Peru	57	17
Uruguay	213,504	84,066
Venezuela	134	55
Asia.		
Japan	7,393	2,366
Turkey in Asia	7,753	2,341
Oceania.		
British Australasia	89,357	$32,610
Africa.		
British Africa	27,244	7,718
French Africa	611,202	193,299
Portuguese Africa	1,310	423
Turkey in Africa—Egypt	240,928	83,305
All other Africa	6,250	2,600

Table 4 shows that Europe received 39,061,992 gallons, or 83.3 per cent of the quantity of cottonseed oil exported in 1900. France received 13,595,564 gallons, which was 34.8 per cent of the European consignment and 29 per cent of the total exported. The Netherlands received 9,411,170 gallons, which was 24.1 per cent of the European consignment and 20.1 per cent of the total quantity exported.

The better grades of oil are exported to the Netherlands, where they are made into artificial butter, while the inferior grades are sent to France for use in making soap.

Table 5 is a summary, by states and for the United States, of the value of the lint cotton produced during the census year; the quantity and actual value of the seed, and the value it would have if crushed for oil; the quantity and cost of seed actually crushed, and the value of its products; the actual value of the cotton crop, and the value it would have if all the seed were crushed; the percentages that the value of the seed and the potential value of its products are of the value of the crop, and that the seed crushed is of the entire quantity produced; and the percentage of the increase in value by manufacture.

TABLE 5.—COMPARATIVE SUMMARY OF THE QUANTITY AND VALUE OF THE COTTON AND COTTONSEED PRODUCED IN 1899, AND RELATIVE VALUE TO TOTAL CROP OF MANUFACTURED AND UNMANUFACTURED SEED.

STATES AND TERRITORIES.	VALUE OF COTTON CROP.		Value of lint cotton.	SEED PRODUCED.		
	Value of lint cotton and seed.	Potential value if all seed were crushed.		Quantity.	Value.	Potential value if crushed for oil.
United States	$376,209,304.33	$401,292,640.33	[1] $324,304,488.33	4,472,103	$51,904,816	$76,988,152
Alabama	43,173,305.34	45,967,993.34	37,125,024.34	515,625	6,048,281	8,842,969
Arkansas	28,298,258.38	29,972,788.38	24,307,743.38	337,607	3,990,515	5,665,045
Georgia	50,759,684.28	54,093,889.28	43,738,293.28	588,052	7,021,341	10,355,596
Indian Territory	5,747,054.04	6,184,189.04	4,968,644.04	69,008	778,410	1,165,545
Louisiana	27,889,585.10	29,975,694.10	24,109,140.10	334,849	3,780,445	5,866,554
Mississippi	49,488,025.59	52,625,424.59	42,621,266.59	591,962	6,866,759	10,004,158
North Carolina	17,455,761.18	18,769,184.18	15,105,956.18	209,804	2,349,805	3,663,178
Oklahoma	2,826,043.36	3,039,285.36	2,500,623.36	34,730	325,420	538,662
South Carolina	34,691,370.71	36,876,279.71	29,115,257.71	399,435	5,576,113	7,761,022
Tennessee	8,412,204.34	8,947,470.34	7,299,096.34	101,376	1,113,108	1,648,374
Texas	103,789,825.83	110,883,509.83	90,077,999.83	1,251,033	13,661,826	20,805,510
All other states[2]	3,728,236.18	4,006,982.18	3,335,443.18	38,572	392,793	671,539

STATES AND TERRITORIES.	SEED CRUSHED.			PER CENT.			
	Quantity.	Cost to mills.	Value of crude products.	Value of seed produced to total value of cotton crop.	Potential value of seed if crushed to value of cotton crop.	Quantity of seed crushed to quantity produced.	Increase in value of seed by manufacture.
United States	2,479,386	$28,682,616	$42,411,835	13.8	20.5	55.4	48.1
Alabama	172,093	2,019,085	2,952,254	14.0	20.5	33.4	46.2
Arkansas	190,015	2,245,710	3,188,812	14.1	20.0	56.3	42.0
Georgia	271,838	3,246,814	4,787,100	13.8	20.4	46.2	47.4
Indian Territory	26,415	297,939	446,078	13.5	20.3	38.3	49.7
Louisiana	250,983	2,833,767	4,397,891	13.6	21.0	75.0	55.2
Mississippi	394,678	4,577,995	6,671,031	13.9	20.2	66.7	45.7
North Carolina	107,660	1,313,663	1,880,015	13.5	21.0	51.3	43.1
Oklahoma	26,425	247,520	410,063	11.5	19.1	76.1	65.7
South Carolina	156,642	2,186,408	3,043,547	16.1	22.4	39.2	39.2
Tennessee	168,307	1,848,829	2,737,038	13.2	19.6	166.0	48.0
Texas	692,604	7,560,661	11,519,656	13.2	20.1	55.4	52.4
All other states[2]	21,731	254,225	378,350	10.5	18.0	56.3	48.8

[1] Does not include $337,464.04, the value of the cotton product of Virginia and Kentucky, there being no oil mills reported from those states.
[2] Includes the statistics reported by establishments distributed as follows: Florida, 1; Kansas, 1; Missouri, 2; Illinois, 1.

It is not to be assumed that the statistics of cotton and seed production, and the percentages derived from them, presented in the foregoing table under "all other states," apply to Illinois, there being no cotton grown in that state.

In ascertaining the value of the cotton crop of 1899, the net quantity of cotton produced, as reported by the ginners, has been multiplied by the average price per pound, or 7.2 cents for upland and 14.4 cents for sea-island cotton, as given in "The Cotton Crop of 1899–1900," issued by the United States Department of Agriculture.

The quantity of seed produced has been ascertained as previously explained, and the value by multiplying the total quantity produced by the average price paid for that portion of the seed which was used by the cottonseed-oil mills. The values of the lint and seed constitute the total value of the cotton crop.

From Table 5 it will be seen that more seed was crushed in Tennessee than was produced in that state. This was due to the fact that several large cottonseed-oil mills located in Memphis used seed produced in Mississippi and Arkansas. Of the seed produced in the state, in each case, Alabama crushed 33.4 per cent; Arkansas, 56.3; Georgia, 46.2; Indian Territory, 38.3; Louisiana, 75.0; Mississippi, 66.7; North Carolina, 51.3; Oklahoma, 76.1; South Carolina, 39.2; and Texas, 55.4. Of the total amount of seed produced in the United States, 55.4 per cent was used by the oil mills.

Table 5 shows also that the value of the seed was increased 48.1 per cent by the manufacture. The value of the entire seed crop, as shown by the table, was $51,904,816, or 13.8 per cent of the total value of the cotton crop, including the value of the seed, while the value of the products from the manufacture of all the seed produced would have been $76,988,152, or 20.5 per cent of the total value of the cotton crop. The value of the total seed crop to the farmers is represented by the former figure. The products obtained from the manufacture of 53.1 per cent of the seed crop were valued by the mills at $42,411,835. The economic value produced by crushing this seed was $13,779,219, and had the entire production of seed been crushed, $25,083,336 would have been added to the general economy of wealth. These values would be materially increased by including the value of the meal after it has been converted into fertilizers, and the value of oil after it has been carried through its various channels of refinement.

Table 6 is a statement of the quantity and value of the several crude products obtainable from 1 ton of cottonseed.

TABLE 6.—CRUDE PRODUCTS PER TON OF COTTONSEED.

PRODUCTS.	Quantity.		Value.	
	Pounds.	*Per cent.*	*Dollars.*	*Per cent.*
Total	2,000	100.0	17.09	100.0
Oil	282	14.1	8.61	50.4
Cake and meal	713	35.7	6.48	37.9
Hulls	943	47.1	1.29	7.5
Linters	23	1.1	0.71	4.2
Waste	39	2.0	.....	.....

Considering the average value of a ton of cottonseed as $11.55, the increase in value by its manufacture, as revealed by the above table, is $5.54.

WASTE.—Upon reaching the oil mill the seed is screened for the purpose of removing sand, bolls, leaves, and sticks. The quantity of these foreign particles varies in different localities, according to the care used in picking and the natural condition of the seed, which is itself variable with soils and seasons. Seed produced on light soil often carries considerable sand. The average waste in screening, for the United States, as shown in Table 1, was 39 pounds per ton, leaving for the further processes 1,961 pounds for each 2,000 pounds of seed entering the mill.

LINTERS.—More or less short lint, called "linters," adheres to the seed as it comes from the gin, according to the character of the machinery used and the variety of seed. Sea-island cottonseed is entirely freed from lint by the first ginning, and is therefore not reginned at the oil mill before being crushed for oil extraction. Upland cottonseed varies in the quantity of lint which remains after the first ginning, some carrying considerable lint, while other seed approaches very closely to the condition of the sea-island variety. Table 2 shows that the quantity of lint secured by the oil mills from the necessary reginning of the seed varied from 19 to 26 pounds per ton, and that the average for the United States was 23 pounds per ton. This short lint was sold at an average price of 3.1 cents per pound. The total quantity obtained was 57,272,053 pounds, valued at $1,801,231.

HULLS.—From the delinting machinery the seed passes to the grinders, where it is cut into pieces, then to a revolving screen so constructed that the meats fall through its meshes and the hulls roll out as tailings, while supplementary shakers make the separation of the meats and hulls complete.

In the beginning of the industry, hulls were often used as fuel in the engines, the ashes being utilized as a fertilizer. This custom, however, has largely been abandoned since the discovery of better uses for the hulls. These hulls are beginning to contribute largely to the wealth of the country. Paper stock made from them has already attracted attention, and one or two plants have recently been erected for this manufacture.

Cattle feeding is, however, by far the most useful purpose to which these hulls have yet been applied, and this use of the product is one which must greatly increase. A mixture of ground hulls and cottonseed meal makes one of the best feeds known to the stock-raising and dairy industries. The proportions employed are about five parts hulls to one of meal in weight. "Two and a half million tons of hulls will fatten for market an equal number of heavy beef cattle, or maintain that number of dairy cattle."[1] The possession of this seed, with all the essential elements of animal food which it contains, may enable the South to

[1] Cotton and Cotton Oil, by D. A. Tompkins

compete with the Northwest in producing the meat supply of the country. The quantity of hulls secured from the seed crushed in 1900 was 1,169,286 tons.

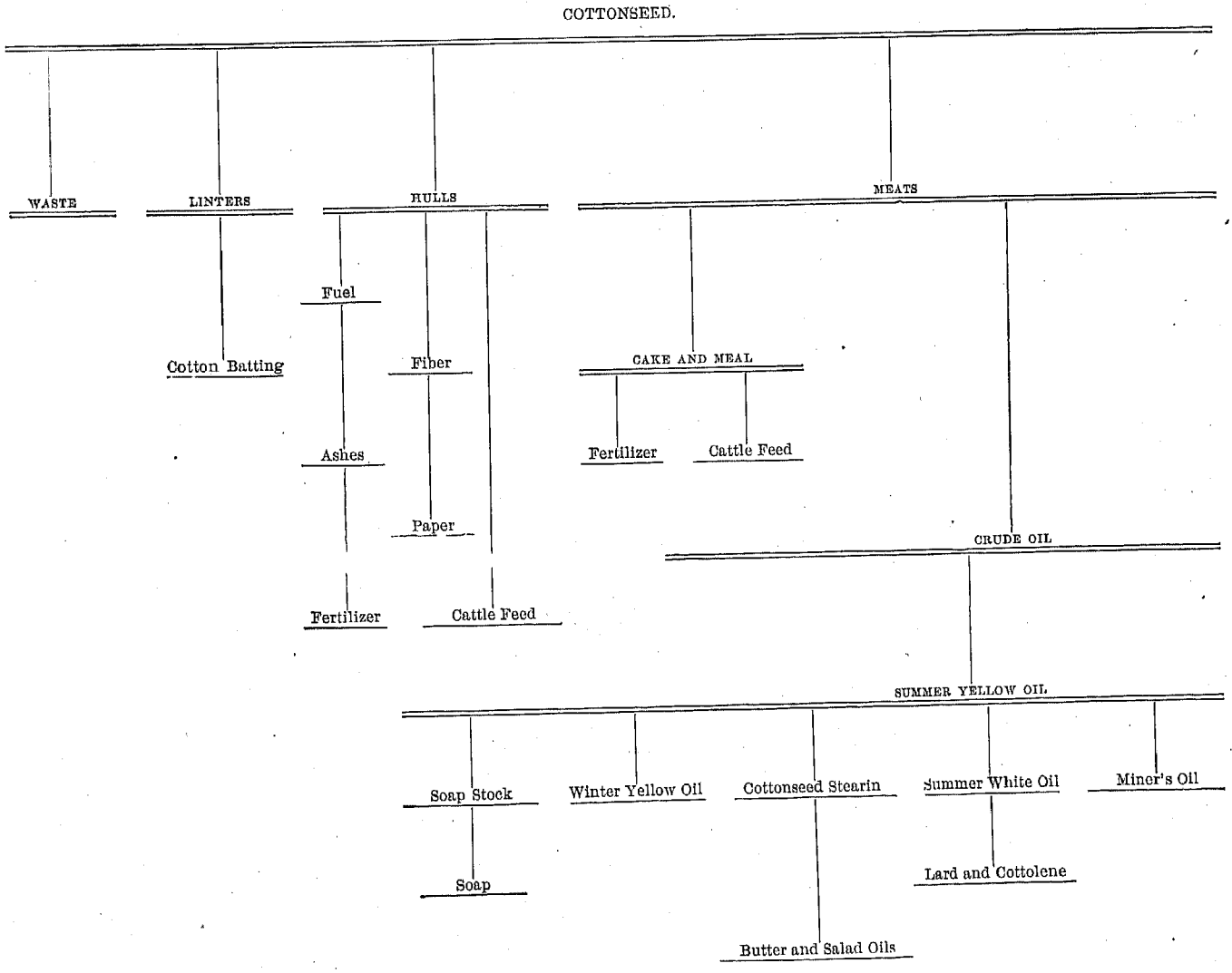
MEAL AND CAKE.—Stripped of lint and hulls, the cottonseed meats or kernels are heated and subjected to hydraulic pressure to extract the oil. The compact residue, known as cake, was formerly used in this condition for cattle feed, and formed a large percentage of the cottonseed products exported. The plan of mixing hulls and meal as a feed and the use of meal as a fertilizer has brought about the present almost universal plan of grinding the cake into meal both for domestic uses and foreign export. Indeed, the prevailing use of this meal is that of a fertilizer. It either goes directly into this channel in its original state or becomes an important element in the manufacture of commercial fertilizers. The demand for meal as a cattle feed is rapidly increasing in states west of the Mississippi River.

OIL.—The most valuable and by far the most interesting product of cottonseed is oil. The quantity obtainable from a ton of seed varies with the natural condition of the seed, the manner in which it is cared for, and the character of the machinery by which it is treated. Among the reports made to the Census Office a range of from twenty-five to fifty gallons per ton is given; for the United States, as shown in Table 2, there was an average of 37.6 gallons per ton. Actual analysis shows a proportion of somewhat more than fifty gallons of oil per ton of seed, and it would appear that through improved machinery this maximum quantity is rapidly being attained.

In the beginning of the industry cottonseed oil was looked upon only as an adulterant, and was used principally in Holland, Italy, and France. This source of demand still exists, but the oil is rapidly gaining ground upon its own merits. Its edibility is the basis of its value, and when it falls below the standard in this particular it must command lower prices.

The several products that may be derived from a given quantity of cottonseed are presented in the following diagram:

DIAGRAM SHOWING PRODUCTS OBTAINABLE FROM COTTONSEED.



The above diagram illustrates the history of a given quantity of cottonseed from the time it reaches the oil mill until it is separated into products, such as fertilizers, lint, cattle feed, paper stock, and oils adapted to various uses.

As appears from this diagram, the oil resulting from the first refining process is known in commerce as "summer yellow oil," and is classed by the trade as "prime" when it is entirely free from water, sediment, and alkali.

The next step is to get what is called "winter yellow oil," obtained by chilling the "summer yellow oil" until it is partially crystallized, and by separating the stearin in presses. This latter product is utilized in making "butter and salad oils" and candles.

"Summer yellow oil," thoroughly mixed with 2 to 3 per cent of fuller's earth and filtered, yields the next grade of oil, which is known in commerce as "summer white oil," from which is obtained "compound" lard and cottolene.

"Miner's oil" is a white oil secured from the "summer yellow oil" by the use of sulphuric acid, and is mixed with petroleum for use in miners' lamps.

Soap stock is the residue obtained from the refining processes. It contains from 50 to 60 per cent of fatty acids and is used in making soaps. Mixed with other greases, this stock makes one of the finest grades of laundry soap. It is also utilized in making cylinders for phonographs.

Experiments with cottonseed oil as an adulterant of linseed oil for paints and for lubricants have not been attended with much success. In the case of linseed oil this is due to the failure to supply the necessary drying qualities. As a lubricant it has been excluded on account of its gummy nature, except for the most ordinary purposes. Some success has attended experiments for the removal of the gum and its use as a substitute for rubber, leaving the oil capable of use as a lubricant.

Prejudice against the use of cottonseed oil in the preparation of foods is gradually growing less, a fact vividly illustrated by the following excerpt:

> If the outsider does not know that olive oil has a legitimate and a strong competitor in cotton oil, the olive grower knows it. He knows it as a hard commercial fact, as the truth has been driven right into his pocketbook.
>
> "France is really the home of the olive grove. In southern France the farmers are disposed to abandon the cultivation of olive groves," writes Consul Skinner, from Marseilles, "because of low and unsatisfactory prices." After a careful investigation of the field our consul makes the following startling statements as to olive oil and the European taste for it:
>
> "It is doubtful if olive oil will ever recover its old-time place, as many vegetable oils, notably American cottonseed oil, are being produced in increased quantities from year to year, and are gaining in the estimation of the public.
>
> "Pure olive oil for edible purposes is at present practically unknown in any important market, and if it were offered for sale it is doubtful whether it would be accepted by the public, except as an inferior article, as the average consumer at the present time prefers the neutralized taste of a mixture of the olive and vegetable oils, and would mistake the fruity flavor of the pure juice of the olive for an adulterated product."
>
> If the producers of olive oil have really recognized the superior merits of cotton oil, why should we be so particular about the oil of olives? This transition of taste and gravitation of trade from the olive to the cotton product doubtless led France to her recent extraordinary legislation in favor of French makes of cotton oil for blending purposes.[1]

In some localities competition for seed among the mills is already affecting the percentage of profit of mills operated only for crude products. As the total quantity of seed crushed approaches the quantity available, the cost of the seed will tend to increase and to cause the equipment of more oil refineries in connection with the oil mills, in order to secure for their products all that the market will permit. The advantage of small refineries in connection with the cottonseed-oil plants is illustrated by the following comparison:[2]

Crude products only.		*Crude and refined products.*	
Cost of seed	$12.00	Cost of seed	$12.00
Cost of operation	3.00	Cost of operation	20.00
Total cost	15.00	Total cost	32.00
Value of products, crude oil, meal, hulls, and lint	18.00	Value of products, butter oil, salad oil, compound lard, butterine, beef	40.00
Profit	3.00	Profit	8.00

[1] The National Provisioner, August 18, 1900.
[2] Cotton and Cotton Oil, by D. A. Tompkins.

ALCOHOLIC LIQUORS.

ALCOHOLIC LIQUORS.

By JOHN H. GARBER.

Alcohol is a natural product derived from sugar in the process of alcoholic fermentation. Wine is the simplest and its manufacture the least complex of all alcoholic liquors, as it consists of fruit juices whose saccharine matter is converted into alcohol on exposure to the air. The manufacture of malt liquors is more complex, as it involves the preliminary process of malting, by which the starch of grains is converted into sugar, which in turn is converted into alcohol by fermentation. Alcohol being produced by fermentation is found in dilute form mingled with other liquids and the manufacture of distillates is the additional process of separating it, more or less completely, from the mixture. As the various liquids vaporize at different temperatures, the separation is effected by the application of such degree of heat as will vaporize the alcohol out of its combinations.

For the collection of statistical data pertaining to the manufacture of alcoholic liquors the Census Office divided them into three classes, namely: Malt liquors, embracing beers, ales, porters, and all similar beverages fermented from malt infusions and included in the products of the brewing industry; distilled liquors, embracing all ardent spirits separated by distillation from fermented fruit juices, molasses, or malt infusions of grain; and vinous liquors, embracing all varieties of wines fermented from the juice of grapes and berries. From the reports of breweries, distilleries, and wineries, representing the three classes of alcoholic liquors, statistics of which are herewith presented in detail, it appears that 1,198,602,104 gallons of malt liquors, 103,330,423 gallons of distillates, and 23,425,567 gallons of wine were manufactured during the census year ending May 31, 1900. This is a total for all classes of 1,325,358,094 gallons, which does not include quantities reported from small establishments with a product less than $500 each; wine returned from farms and as a subsidiary product of distilleries; and spirits returned from wineries, principally as a by-product. In estimating the annual consumption for 1900, the quantity of tax-paid spirits, not the quantity manufactured, was employed, and the differences between imports and domestic and foreign exports were considered. On this basis the total estimated consumption for the census year was 1,322,166,685 gallons, or 17.3 gallons per capita.

The totals for the three classes show 2,835 establishments, with a capital of $457,674,087, and products valued at $340,615,466. This last amount includes $96,798,443 as the value of distilled liquors, which includes an indeterminate amount of internal-revenue tax, because of a lack of uniformity in reporting it. If such tax were included in every instance, the value of the distillates reported would approximate $140,000,000 and the total value of all liquors would be increased from $340,615,466 to about $384,000,000. Returns from breweries uniformly included internal-revenue tax in values of products.

Malting, bottling, and the manufacture of mineral and soda waters, while not presented in detail in this report, are, in their relation to the manufacture of alcoholic liquors, correlative industries. At the census of 1900, the malting industry showed 146 establishments, with $39,288,102 capital, 1,990 wage-earners, $14,816,741 for cost of materials, and products valued at $19,373,600; the bottling industry, 2,064 establishments, with $16,620,152 capital, 7,680 wage-earners, $28,087,823 for cost of materials, and products valued at $41,640,672; and the manufacture of mineral and soda waters, 2,816 establishments, with $20,518,708 capital, 8,985 wage-earners, $8,801,467 for cost of materials, and products valued at $23,874,429. The malt reported by the maltsters was very largely manufactured into malted beverages, and a large proportion of the independent bottling plants were bottlers of malt liquors and whiskies purchased from brewers and distillers. The totals given for the value of products for these two industries are, therefore, to a considerable extent, duplications of the corresponding totals for alcoholic liquors.

Table 1 shows the combined totals for the three classes of alcoholic liquors and the corresponding totals for each class.

TABLE 1.—ALCOHOLIC LIQUORS: SUMMARY, 1900.

	Total.	Liquors, malt.	Liquors, distilled.	Liquors, vinous.
Number of establishments.	2,835	1,509	967	359
Capital	$457,674,087	$415,284,468	$32,551,604	$9,838,015
Salaried officials, clerks, etc., number	8,158	7,153	661	344
Salaries	$14,801,644	$13,046,540	$889,606	$365,498
Wage-earners, average number	44,417	39,532	3,722	1,163
Total wages	$28,005,484	$25,826,211	$1,733,218	$446,055
Men, 16 years and over.	43,107	38,385	3,623	1,099
Wages	$27,726,021	$25,573,612	$1,715,552	$436,857
Women, 16 years and over	646	504	81	61
Wages	$156,850	$132,614	$15,428	$8,808
Children, under 16 years	664	643	18	3
Wages	$122,613	$119,985	$2,288	$390
Miscellaneous expenses	$183,099,796	$109,329,231	$73,218,227	$552,338
Cost of materials used	$70,512,042	$51,674,928	$15,147,784	$3,689,330
Value of products	$340,615,466	$237,269,713	$96,798,443	$6,547,310

Table 2, compiled from the reports on Commerce and Navigation of the United States, by the Bureau of Statistics, Treasury Department, shows the quantity and value of imports and foreign and domestic exports of the different classes of alcoholic liquors from 1891 to 1900, inclusive, and the annual averages from 1871 to 1890, inclusive.

TABLE 2.—ALCOHOLIC LIQUORS: IMPORTS AND EXPORTS, 1891 TO 1900, INCLUSIVE; ANNUAL AVERAGES FOR DECADES ENDING WITH 1880 AND 1890, RESPECTIVELY.

	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891	Annual average, 1881 to 1890, inclusive.	Annual average, 1871 to 1880, inclusive.
IMPORTS.												
Aggregate value	$12,758,582	$11,223,163	$9,305,504	$12,272,872	$11,849,715	$11,423,123	$10,660,375	$15,147,884	$13,604,958	$16,027,423	.....	.....
Beer, ale, porter, and other malt liquors:												
Gallons	3,310,320	2,847,234	2,510,787	2,964,644	3,283,404	2,971,676	2,910,540	3,365,389	2,929,581	3,082,977	2,101,676	[1]1,519,088
Value	$1,727,256	$1,487,878	$1,201,580	$1,560,293	$1,665,016	$1,514,845	$1,510,767	$1,940,370	$1,709,960	$1,765,702	$1,176,680	$1,184,156
Spirits, distilled, and cordials:												
In casks—												
Gallons[2]	2,482,020	2,445,965	1,763,318	3,021,465	2,539,252	2,223,161	2,155,191	2,266,742	2,239,194	3,453,671	1,604,434	1,633,261
Value[2]	$3,609,881	$3,145,079	$2,134,794	$3,850,114	$3,077,694	$2,730,741	$2,410,130	$3,002,111	$2,950,495	$4,254,661	$2,072,794	$1,711,300
In bottles—												
Dozens[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	105,554
Value[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$502,524
Wines:												
Total value	$7,421,495	$6,590,206	$5,969,180	$6,862,465	$7,107,005	$7,183,537	$6,739,478	$10,205,353	$8,944,503	$10,007,060	.....	.....
In casks—												
Gallons	2,533,828	2,253,226	1,930,870	2,997,952	2,834,898	2,789,153	2,599,693	3,525,625	3,477,989	3,860,503	3,865,537	6,392,826
Value	$1,744,736	$1,573,573	$1,392,710	$2,039,250	$1,950,770	$1,945,347	$1,817,813	$2,505,024	$2,464,484	$2,641,816	$2,617,641	$2,632,754
In bottles—												
Dozens	626,069	537,244	492,748	537,909	560,583	554,536	533,457	787,984	684,732	748,750	535,722	386,795
Value	$5,676,759	$5,016,633	$4,576,470	$4,823,215	$5,156,235	$5,238,190	$4,921,665	$7,700,329	$6,480,019	$7,365,244	$4,786,982	$2,636,639
EXPORTS OF FOREIGN.												
Aggregate value	$154,269	$167,074	$137,100	$269,735	$253,499	$117,201	$146,412	$93,526	$119,592	$117,603	.....	.....
Beer, ale, porter, and other malt liquors:												
Gallons	7,841	16,425	9,169	6,968	7,652	6,293	6,430	15,724	6,431	8,586	8,865	29,083
Value	$6,808	$9,843	$7,119	$5,561	$5,233	$4,697	$4,505	$10,252	$4,952	$6,630	$5,936	$24,038
Spirits, distilled, and cordials:												
In casks—												
Gallons[2]	46,767	58,956	40,835	38,455	58,606	38,385	48,792	46,954	75,323	51,247	62,693	128,456
Value[2]	$81,783	$102,594	$60,126	$55,290	$119,976	$52,360	$55,934	$44,969	$55,470	$47,567	$71,817	$105,679
In bottles—												
Dozens[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8,194
Value[2]	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$32,271
Wines:												
Total value	$65,728	$54,637	$69,855	$208,884	$128,290	$60,144	$85,978	$38,305	$59,170	$63,406	.....	.....
In casks—												
Gallons	15,122	21,387	31,615	28,232	31,979	22,536	21,027	15,785	35,830	26,711	69,179	109,020
Value	$6,268	$12,470	$14,653	$13,475	$18,855	$11,609	$11,120	$9,146	$18,795	$14,585	$37,058	$49,872
In bottles—												
Dozens	8,438	5,677	8,086	16,981	13,799	7,509	8,140	5,585	5,393	8,540	10,172	10,857
Value	$59,460	$42,167	$55,202	$195,409	$109,935	$48,535	$74,858	$29,159	$40,375	$48,821	$64,400	$50,274
EXPORTS OF DOMESTIC.												
Aggregate value	$4,697,692	$4,620,819	$2,935,302	$3,138,469	$2,890,445	$4,092,242	$6,415,186	$3,648,697	$3,472,483	$2,910,212	.....	.....
Beer, ale, and porter:												
Total value	$2,139,216	$1,888,124	$585,579	$723,949	$659,875	$558,770	$548,979	$665,538	$657,934	$672,243	.....	.....
In casks—												
Gallons	761,411	602,055	391,802	390,048	290,383	258,620	307,077	245,497	260,724	242,991	197,892	[3]101,411
Value	$194,157	$154,751	$88,548	$87,112	$69,759	$66,322	$77,390	$65,219	$68,150	$69,602	$62,704	[3]$32,890
In bottles—												
Dozens	1,578,240	1,433,799	406,231	549,910	492,055	426,777	351,625	417,704	402,358	413,278	292,472	[3]40,776
Value	$1,945,059	$1,793,373	$497,031	$636,837	$590,116	$492,448	$471,589	$600,319	$589,784	$602,641	$490,280	[3]$67,007
Spirits, distilled:												
Total value	$1,932,884	$2,056,365	$1,620,974	$1,715,806	$1,579,283	$2,931,562	$5,421,759	$2,561,612	$2,375,519	$1,866,492	.....	.....
Brandy—												
Gallons	80,259	20,944	24,886	11,815	89,259	100,719	361,653	123,518	216,696	136,529	[4]	[4]
Value	$88,698	$29,289	$39,455	$12,640	$87,294	$94,924	$291,022	$90,781	$178,294	$111,657	[4]	[4]
Rum—												
Gallons	670,410	850,719	607,634	808,393	865,643	879,153	977,994	647,415	773,713	1,025,226	[5]702,935	[5]840,386
Value	$903,808	$1,175,306	$845,673	$1,102,267	$1,174,093	$1,134,965	$1,081,716	$778,006	$921,918	$1,230,994	$314,472	$355,389
Whisky—												
Gallons	954,962	324,802	304,094	590,695	166,496	1,460,357	4,362,455	1,693,098	872,445	294,651	[6]4,031,040	[6]2,231,523
Value	$886,101	$424,482	$272,280	$460,853	$232,604	$1,520,280	$3,986,855	$1,640,547	$799,875	$343,542	$1,837,674	$766,417
Alcohol, including pure, neutral, or cologne spirits—												
Gallons	177,974	1,476,028	1,619,290	416,725	331,407	676,332	173,527	162,181	1,440,219	418,935	[7]	[7]
Value	$59,277	$427,288	$463,616	$140,046	$85,292	$181,393	$62,166	$52,328	$475,937	$180,299	[7]	[7]
Wines:												
Total value	$625,592	$676,330	$728,749	$698,714	$651,287	$601,910	$444,448	$421,547	$489,030	$371,477	.....	.....
In bottles—												
Dozens	9,854	10,973	9,672	16,794	17,147	13,919	13,813	11,128	15,054	11,409	[8]	[8]
Value	$49,927	$52,015	$46,721	$69,444	$60,460	$56,202	$63,860	$51,654	$67,686	$52,392	[8]	[8]
In other coverings—												
Gallons	1,408,859	1,498,078	1,623,103	1,389,375	1,339,090	1,125,297	802,192	708,558	655,795	543,292	[8]198,019	[8]52,742
Value	$575,665	$624,315	$682,028	$629,270	$581,827	$545,708	$380,588	$369,893	$371,344	$319,085	[8]$151,156	[8]$49,418

[1] Quantity not shown in 1871; average is for nine years.
[2] Quantities and values "in bottles" included with those "in casks," since 1881, not being reported separately after 1888.
[3] Quantities and values of cider included from 1871 to 1878.
[4] Not reported separately previous to 1891.
[5] Distilled from molasses.
[6] Distilled from grain.
[7] Not reported separately previous to 1884. No average can be shown for decade.
[8] Quantities and values "in bottles" included with those "in other coverings," not being reported separately previous to 1884.

THE MANUFACTURE OF MALT LIQUORS.

In colonial times, as well as in the early decades of the nation's history, the consumption of malt liquors was relatively small and increased slowly. The wide distribution of small quantities of wine manufactured from grapes or currants, the introduction of tea, the general consumption of all classes of distilled spirits, and the household manufacture of cider and fruit brandies satisfied the tastes of the people, and the demand for malt liquors was of slow and gradual development. Where the demand existed at all it was for ale, porter, or stout. The manufacture of lager beer in the United States was begun about 1840. Its use extended with the general increase of population, the influx of German immigrants, and the cultivation of the tastes of the people for milder beverages. In 1900 its use had almost entirely superseded that of ale and porter.

Table 3 is a comparative summary of statistics of the manufacture of malt liquors as returned at the censuses of 1850 to 1900, inclusive, with the percentages of increase for each decade.

TABLE 3.—LIQUORS, MALT: COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870	1850 to 1860
Number of establishments	1,509	1,248	2,191	1,972	1,269	431	20.9	[1]43.0	11.1	55.4	194.4
Capital	$415,284,468	$232,471,290	$91,208,224	$48,779,485	$15,782,342	$4,072,380	78.6	154.9	87.0	209.1	287.5
Salaried officials, clerks, etc., number	7,153	24,543	(3)	(3)	(3)	(3)	57.5	.....	.....	.....	.....
Salaries	$13,046,540	[2]$7,669,161	(3)	(3)	(3)	(3)	70.1	.....	.....	.....	.....
Wage-earners, average number	39,532	30,257	26,220	12,443	6,483	2,347	30.7	15.4	110.7	93.4	174.1
Total wages	$25,826,211	$20,713,388	$12,198,053	$6,758,602	$2,305,970	$654,144	24.7	69.8	80.5	193.1	252.5
Men, 16 years and over	38,885	29,491	26,001	12,320	6,412	2,336	30.2	13.4	111.0	92.1	174.5
Wages	$25,573,612	$20,564,793	(3)	(3)	(3)	(3)	24.4	.....	.....	.....	.....
Women, 16 years and over	504	250	29	29	21	11	101.6	762.1	.....	38.1	90.9
Wages	$132,614	$55,757	(3)	(3)	(3)	(3)	137.8	.....	.....	.....	.....
Children, under 16 years	643	516	190	94	(3)	(3)	24.6	171.6	102.1	.....	.....
Wages	$119,985	$92,833	(3)	(3)	(3)	(3)	29.2	.....	.....	.....	.....
Miscellaneous expenses	$109,329,231	$48,276,290	(4)	(4)	(4)	(4)	126.5	.....	.....	.....	.....
Cost of materials used	$51,674,928	$64,003,347	$56,886,500	$28,177,684	$9,997,293	$3,055,266	[1]19.3	12.6	101.7	181.9	227.2
Value of products	$237,269,713	$182,731,622	$101,058,385	$55,706,643	$21,310,933	$5,728,568	29.8	80.8	81.4	161.4	272.0

[1] Decrease.
[2] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 9.)
[3] Not reported separately.
[4] Not reported.

Table 3 shows that the brewing industry for the last half century has had practically an uninterrupted growth. In the percentages of increase or decrease for the different decades, a decrease is shown in but two instances, viz., in the number of establishments from 1880 to 1890, and in the cost of materials from 1890 to 1900. From 1880 to 1890 the number of establishments decreased 943, or 43 per cent, and from 1890 to 1900 increased 261, or 20.9 per cent. The net decrease in the twenty years from 1880 to 1900 was 682, or 31.1 per cent, which was largely due to consolidations of brewing interests and the lack of uniformity in reporting the number of establishments included in such consolidations. The decrease in cost of materials was due to the lower prices of barley, hops, and corn, prevailing in 1900 as compared with 1890, and to the introduction of improved methods of manufacture, which brought about a more thorough extraction and use of the productive elements of materials. The introduction of improved and economic methods of refrigeration, while adding largely to the capital of the industry, also aided very materially in reducing cost of production.

The decrease of 19.3 per cent in cost of materials from 1890 to 1900 was accompanied by an increase of 29.8 per cent in value of products. This discrepancy is much more apparent than real, since in 1900 the value of malt liquors included the increased cost of the internal-revenue stamps required under the war tax then in effect. If the net price of the product had been reported—i. e., the price less the internal-revenue tax—the percentage of increase for 1900 would approximate 5.4 per cent instead of 29.8 per cent, and the apparent discrepancy between the percentages of change in cost of materials and value of products would disappear.

Miscellaneous expenses increased $61,052,941, or 126.5 per cent, in the decade from 1890 to 1900. This disproportionate increase was due to the same circumstances noted above—the increase in internal-revenue tax, which was one of the items of miscellaneous expense. In 1890 the net tax on malt liquors was 92½ cents, and in 1900, $1.85 per barrel. The amount of revenue tax paid in 1900 exceeded that paid in 1890 by approximately $47,000,000, leaving an increase of $14,000,000, or 29.1 per cent, in the other items of miscellaneous expense.

In the half century closing with 1900 the industry increased in number of establishments from 431 to 1,509; in capital, from $4,072,380 to $415,284,468; in number of wage-earners, from 2,347 to 39,532; in wages, from $654,144 to $25,826,211; and in value of products from $5,728,568 to $237,269,713.

Table 4 shows the comparative distribution of capital for 1890 and 1900.

TABLE 4.—LIQUORS, MALT: COMPARATIVE SUMMARY, CAPITAL, 1890 AND 1900.

	1900	1890	Per cent of increase.
Total	$415,284,468	$232,471,290	78.6
Land	53,611,097	33,538,926	59.8
Buildings	119,232,506	64,412,133	85.1
Machinery, tools, and implements	76,398,777	50,288,210	51.9
Cash and sundries	166,042,088	84,232,021	97.1

Table 4 shows that at the census of 1900 the capital amounted to $415,284,468, an increase of $182,813,178, or 78.6 per cent, for the decade. This amount was distributed as follows: Land, $53,611,097; buildings, $119,232,506; machinery, tools, and implements, $76,398,777; and cash and sundries, $166,042,088. Of the four divisions of capital, cash and sundries shows the largest percentage of increase; this division includes cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries. In 1900 the amount reported for these items was $166,042,088, and in 1890, $84,232,021, an increase of $81,810,067, or 97.1 per cent. This relatively higher rate of increase is in part due to the greater cost of internal-revenue stamps carried on hand and in part to the increased facilities made necessary by the expansion of an industry in which competition is active.

Table 4 does not include, for 1900, 16 idle establishments, with a capital of $945,577, and 15 active establishments, each with a product less than $500, with a capital of $30,965. The combined capital of these two classes of establishments was $976,542, making an aggregate capital for the industry of $416,261,010.

Table 5 is a comparative summary, by states and territories, of the principal statistics of the industry for the censuses of 1890 and 1900.

TABLE 5.—LIQUORS, MALT: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
United States	1900	1,509	$415,284,468	7,158	$13,046,540	39,532	$25,826,211	$109,329,231	$51,674,928	$237,269,713
	1890	1,248	232,471,290	[1] 4,543	[1] 7,669,161	30,257	20,713,383	48,276,290	64,003,347	182,731,622
Alabama	1900	5	829,446	34	40,142	239	75,157	150,039	134,653	481,640
	1890	3	438,000	13	21,500	89	54,740	88,046	140,609	344,986
California	1900	99	8,183,286	125	212,634	950	753,424	2,126,784	1,276,575	5,085,462
	1890	65	5,525,041	104	130,463	700	592,153	943,505	1,179,897	3,628,236
Colorado	1900	14	5,682,204	39	78,121	323	256,764	885,518	375,893	2,042,863
	1890	11	1,917,050	33	70,280	236	214,407	252,024	555,149	1,601,168
Connecticut	1900	20	3,108,778	81	132,897	344	278,946	1,156,308	639,555	2,652,819
	1890	16	1,470,120	45	56,372	203	157,241	349,854	584,390	1,455,350
Delaware	1900	5	1,126,788	18	25,301	84	56,091	285,662	123,327	616,496
	1890	3	456,876	10	14,780	48	33,280	68,068	100,608	247,046
District of Columbia	1900	4	2,298,704	35	56,104	191	140,690	650,902	286,653	1,340,041
	1890	5	886,484	17	24,800	103	57,622	178,413	295,017	853,800
Georgia	1900	5	1,327,330	37	64,900	300	128,288	410,745	275,747	973,212
	1890	5	923,247	28	31,950	165	97,236	92,140	241,783	580,760
Idaho	1900	16	144,032	1	600	29	19,064	26,195	19,301	74,868
	1890	5	16,030	6	2,080	9	2,354	3,294	5,265	17,580
Illinois	1900	94	32,798,080	578	1,040,689	3,269	2,059,792	9,927,696	4,036,178	19,733,821
	1890	88	21,294,107	321	537,320	2,622	1,519,509	3,452,695	4,627,634	13,664,046
Indiana	1900	42	6,347,997	205	317,721	1,045	601,638	2,534,285	1,127,079	5,777,047
	1890	37	4,589,030	121	186,298	865	516,307	1,203,239	1,144,002	3,837,844
Iowa	1900	21	2,420,515	58	84,136	321	189,916	736,550	385,164	1,713,911
	1890	18	1,057,292	52	47,970	155	88,786	190,124	294,626	780,585
Kentucky	1900	26	5,131,654	124	192,525	591	327,242	1,500,606	630,969	3,186,627
	1890	29	4,005,743	88	144,172	509	320,685	818,803	853,126	2,600,897
Louisiana	1900	6	3,299,326	57	87,556	374	224,985	792,468	403,440	1,472,062
	1890	8	3,188,232	103	132,672	179	138,212	839,331	592,562	1,905,760
Maryland	1900	16	13,857,323	161	262,916	752	484,318	1,568,108	878,933	4,133,797
	1890	32	5,824,669	88	141,492	735	530,885	1,186,155	1,586,951	4,662,887
Massachusetts	1900	40	18,136,623	322	639,025	1,651	1,340,412	4,781,540	2,843,050	11,255,613
	1890	26	6,003,344	150	260,169	818	613,070	1,320,173	2,064,079	5,355,438
Michigan	1900	77	6,235,484	242	297,150	980	599,319	2,402,652	1,187,770	5,296,825
	1890	78	3,963,163	152	168,670	687	419,439	737,785	998,128	2,979,258
Minnesota	1900	78	8,530,722	154	213,544	856	417,882	1,996,040	867,901	4,456,928
	1890	66	3,625,239	110	116,727	548	295,935	526,786	751,907	2,206,366
Missouri	1900	49	25,781,930	398	836,388	3,150	1,890,100	6,137,846	3,073,011	13,776,905
	1890	30	16,689,575	288	594,420	2,834	1,847,195	3,114,676	6,563,536	16,954,137
Montana	1900	21	1,203,516	34	68,280	193	169,066	433,577	375,631	1,276,331
	1890	6	452,400	6	7,340	47	43,380	54,874	60,930	204,645

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 9.)

TABLE 5.—LIQUORS, MALT: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
Nebraska	1900	19	$2,678,593	45	$94,215	200	$131,455	$635,031	$311,783	$1,433,501
	1890	14	1,464,211	28	40,850	172	125,333	219,854	357,266	1,079,865
Nevada	1900	5	44,410			11	8,760	6,935	9,240	29,216
	[1]1890									
New Hampshire	1900	5	2,047,576	34	64,578	280	185,300	778,198	599,144	1,955,628
	[1]1890									
New Jersey	1900	45	26,380,466	350	813,888	1,723	1,360,915	6,733,772	2,782,420	14,386,456
	1890	34	10,184,540	221	459,271	1,174	949,661	2,490,157	3,592,491	10,018,393
New Mexico	1900	3	42,500	1	800	14	8,387	11,456	7,312	37,136
	[1]1890									
New York	1900	225	95,057,875	1,721	3,673,854	7,424	5,630,996	26,954,024	11,418,383	56,137,854
	1890	282	67,759,552	1,284	2,509,998	7,001	5,525,189	16,445,206	18,776,129	53,429,685
Ohio	1900	112	26,822,396	547	879,010	3,464	2,292,652	8,104,240	4,277,812	18,522,639
	1890	106	21,491,924	377	604,150	3,117	2,224,351	3,826,311	5,272,894	15,899,629
Oregon	1900	24	818,654	19	24,200	136	106,041	215,584	172,615	714,242
	1890	13	805,135	20	21,819	80	67,240	158,826	165,887	613,316
Pennsylvania	1900	208	63,684,480	816	1,474,092	4,505	2,884,242	13,039,371	6,609,889	29,162,743
	1890	163	26,106,355	414	702,500	3,148	2,129,443	4,866,575	6,461,082	18,358,784
Rhode Island	1900	6	3,338,276	53	89,674	296	223,712	859,619	453,406	1,880,171
	1890	3	287,500	15	29,125	82	50,900	102,376	187,500	436,846
South Dakota	1900	4	560,794	10	12,420	61	23,949	78,216	37,843	280,080
	[1]1890									
Tennessee	1900	4	1,277,772	31	51,500	288	129,782	517,278	262,437	1,175,304
	1890	4	882,434	24	48,282	147	75,288	106,659	213,393	618,970
Texas	1900	9	4,439,012	98	180,619	585	354,682	1,210,381	646,794	2,689,606
	1890	7	1,534,775	43	57,719	401	205,628	379,309	495,807	1,702,087
Utah	1900	7	613,992	22	21,178	89	53,751	123,838	120,995	432,885
	1890	5	150,500	7	6,810	39	18,875	15,011	87,206	113,531
Virginia	1900	6	2,000,954	72	95,458	300	144,882	374,865	215,923	972,820
	1890									
Washington	1900	25	1,506,762	53	81,830	211	171,456	385,884	294,565	1,280,525
	1890	13	1,328,329	21	36,305	209	176,970	193,186	424,637	1,178,306
West Virginia	1900	8	1,714,050	60	70,803	256	117,320	492,611	197,724	1,113,021
	1890	6	883,768	27	27,582	154	91,460	188,911	323,894	747,402
Wisconsin	1900	147	35,317,950	484	726,069	3,904	1,926,730	10,259,291	4,237,454	19,394,709
	1890	107	16,803,323	306	407,271	2,859	1,457,808	3,806,846	4,829,390	14,193,057
Wyoming	1900	4	86,301	2	2,400	19	12,300	18,710	11,748	52,540
	[1]1890									
All other states	[2]1900	5	498,467	32	34,328	124	45,855	126,456	66,611	321,419
	[3]1890	10	563,352	26	28,054	122	73,331	67,078	226,072	455,003

[1] Included in "all other states."
[2] Includes establishments distributed as follows: Arkansas, 1; Florida, 1; Kansas, 2; South Carolina, 1.
[3] Includes establishments distributed as follows: Nevada, 2; New Hampshire, 1; New Mexico, 2; North Dakota, 1; South Carolina, 1; South Dakota, 1; Wyoming, 2.

This table shows a wider distribution for the manufacture of malt liquors than is shown by the corresponding tables of this report for the manufacture of either distillates or wine. Commercial wine making is necessarily localized where soil and climatic conditions will produce the desired varieties of grapes. The manufacture of distilled liquors from grain, owing to the fact that the finished product is less bulky than the raw material, and consequently costs less to transport, tends to localize at points where the cereal supply is ample and its cost least. This is particularly true of the manufacture of alcohol and pure, neutral, or cologne spirits. In the manufacture of malt liquors the transportation of the finished product involves greater expense than that of the materials used, and the industry tends to localize at points of consumption. There are a few large establishments, however, with an output ranging from 500,000 to 1,000,000 barrels a year, and whose products have a wide distribution, to which this law does not now apply, although it governed their inception and influenced their early history. At the census of 1900, 38 states and territories reported a total of 1,504 establishments out of 1,509 for the United States, and practically every state showed a substantial increase in value of products, the three notable exceptions being Louisiana, Maryland, and Missouri.

The leading states in value of malt liquors produced during the census year were as follows: New York, $56,137,854; Pennsylvania, $29,162,743; Illinois, $19,733,821; Wisconsin, $19,394,709; Ohio, $18,522,639; New Jersey, $14,386,456; and Missouri, $13,776,905. From Table 9 it appears that the quantity produced in each of the same states was as follows: New York, 9,593,085 barrels; Pennsylvania, 4,648,172; Illinois, 3,794,782; Wisconsin, 3,049,191; Ohio, 3,028,116; Missouri, 2,410,999; and New Jersey, 2,117,491.

Table 6 shows the quantity and cost of materials and the quantity and value of products for 1900.

TABLE 6.—LIQUORS, MALT: MATERIALS AND PRODUCTS, 1900.

	Unit of measure.	Quantity.	Cost of materials.	Value of products.
Materials:				
Total			$51,674,928	
Malt	Bushels	36,385,365	20,539,308	
Corn, in partially manufactured form.	Pounds	483,998,984	4,805,887	
Barley	Bushels	11,232,599	5,554,669	
Hops	Pounds	37,465,811	5,858,265	
Fuel, and rent of power and heat.			4,742,998	
Mill supplies			599,479	
All other materials.			8,742,771	
Freight			831,551	
Products:				
Total				$237,269,713
Beer, ale, and porter.	Barrels of 31 gallons.	38,664,584		234,275,259
All other products				2,994,454

It appears from Table 6 that there were manufactured during the census year, 38,664,584 barrels of malt liquors, valued at $234,275,259, or an average of $6.06 a barrel. This represents the value of the product at the brewery, packed in barrels, kegs, or bottles, and ready for shipment, with the necessary revenue stamps affixed. This table shows also that 36,385,365 bushels of malt, 11,232,599 bushels of barley, 37,465,811 pounds of hops, and 483,998,984 pounds of corn were the principal materials used in the production. In addition there were consumed and reported under "all other materials" considerable quantities of rice, sirup, glucose, and similar ingredients. With the 11,232,599 bushels of barley converted into malt, the approximate average quantities of the principal ingredients consumed in producing a barrel of beer were 1¼ bushels of malt, 1 pound of hops, and 12 pounds of corn. The corn was used in the form of meal and grits of varying degrees of coarseness, or in the form of cerealine (flakes) or maizone. The hops used ranged in quality from the cheapest domestic product to the finest Bohemian importation.

Table 7, taken from the annual report of the Commissioner of Internal Revenue for the fiscal year 1900, shows the quantity of malt liquors manufactured in the United States for each fiscal year from 1863 to 1900, inclusive.

TABLE 7.—LIQUORS, MALT: QUANTITY MANUFACTURED IN EACH FISCAL YEAR FROM 1863 TO 1900.

YEAR.	Number of barrels.	YEAR.	Number of barrels.
1863	2,006,625	1882	16,952,085
1864	3,141,381	1883	17,757,892
1865	3,657,181	1884	18,998,619
1866	5,115,140	1885	19,185,953
1867	6,207,402	1886	20,710,933
1868	6,146,663	1887	23,121,526
1869	6,342,055	1888	24,680,219
1870	6,574,617	1889	25,119,853
1871	7,740,260	1890	27,561,944
1872	8,659,427	1891	30,478,192
1873	9,633,323	1892	31,817,836
1874	9,600,897	1893	34,554,317
1875	9,452,697	1894	33,334,783
1876	9,902,352	1895	33,661,411
1877	9,810,060	1896	35,826,098
1878	10,241,471	1897	34,428,094
1879	11,103,084	1898	37,493,306
1880	13,347,111	1899	36,581,114
1881	14,311,028	1900	39,330,849

Table 7 shows 39,330,849 barrels reported to the Internal-Revenue Bureau for the fiscal year ending June 30, 1900, as against 38,664,584 reported to the Census Office for the census year ending May 31, 1900. The census tabulation does not include 15 breweries, each with a product less than $500, whose combined product was 3,896 barrels; and a number of small establishments, principally producers of weiss beer, which were not reported. With these items considered, and also the difference in time covered by the two reports, the figures of the Internal-Revenue and Census bureaus practically agree.

The 38,664,584 barrels reported at the census of 1900 were equivalent to 1,198,602,104 gallons. In computing per capita consumption, malt liquors, because of the comparatively short time necessary to prepare them for market, do not present the difficulties common to wines and distillates, which require longer time for aging. Beer is the product of a slow fermentation and some few months are necessary to mature it properly, but there is practical uniformity in the quantities carried over from year to year, and the annual production, less the excess of exports over imports, practically represents the annual consumption. During the fiscal year ending June 30, 1900, 5,496,131 gallons were exported, and during the same period 3,310,320 gallons were imported, of which 7,841 gallons were exported, leaving 3,302,479 gallons imported for domestic consumption, an excess of exports over net imports of 2,193,652 gallons. This quantity, subtracted from the total production, leaves 1,196,408,452 for annual consumption in the United States, or 15.7 gallons per capita.

Table 8 shows the quantity, value, and destination of malt liquors exported during the fiscal year 1900.

TABLE 8.—LIQUORS, MALT: EXPORTS, BY COUNTRIES, 1900.[1]

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
Total	1,578,240	$1,945,059	761,411	$194,157
EUROPE.				
Total	5,683	8,787	231	61
Azores, and Madeira Islands	152	278	.....	.....
Belgium	12	19	.....	.....
France	487	1,011	.....	.....
Germany	941	1,266	200	50
Gibraltar	100	180	.....	.....
Italy	10	17	.....	.....
Malta, Gozo, etc	140	185	.....	.....
Portugal	525	685	.....	.....
Spain	155	265	.....	.....
Turkey in Europe	1,487	1,920	.....	.....
United Kingdom	1,674	2,961	31	11
NORTH AMERICA.				
Total	665,888	897,178	554,798	135,295
Bermuda	1,349	2,003	116	21
British Honduras	2,912	4,956	3,804	706
Dominion of Canada:				
Nova Scotia, New Brunswick, etc	1,247	1,504	6,682	1,827
Quebec, Ontario, Manitoba, etc	14,071	16,611	155,390	27,045
British Columbia	32,082	39,741	34,740	8,831
Newfoundland and Labrador	74	76	271	111
Central American states:				
Costa Rica	12,190	19,659	.....	.....

[1] Commerce and Navigation of the United States: United States Treasury Department, Annual Report, 1900.

TABLE 8.—LIQUORS, MALT: EXPORTS, BY COUNTRIES, 1900—Continued.

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
NORTH AMERICA—continued.				
Central American states—continued:				
Guatemala	1,680	$1,919	200	$40
Honduras	5,675	8,127	349	80
Nicaragua	15,981	18,625	4,190	1,063
Salvador	8,715	6,319	.....	.....
Mexico	24,893	29,413	55,200	17,628
Miquelon	928	891	.....	.....
West Indies:				
British	19,961	31,013	6,063	1,438
Cuba	445,621	601,920	285,448	75,602
Danish	636	740	.....	.....
Dutch	771	1,305	.....	.....
French	2,684	3,844	.....	.....
Haiti	2,402	4,177	2,330	900
Porto Rico	69,635	101,217	.....	.....
Santo Domingo	2,381	3,118	15	3
SOUTH AMERICA.				
Total	64,432	104,678	514	168
Bolivia	50	107	.....	.....
Brazil	45,845	78,389	.....	.....
Chile	91	135	.....	.....
Colombia	11,094	16,479	64	33
Ecuador	1,517	1,894	.....	.....
Guianas:				
British	2,190	2,362	450	135
Dutch	824	1,075	.....	.....
French	411	676	.....	.....
Peru	1,540	2,252	.....	.....
Venezuela	870	1,310	.....	.....
ASIA.				
Total	203,476	197,997	43,037	13,251
Aden	225	260	.....	.....
Chinese Empire	37,187	42,464	.....	.....
East Indies:				
British	603	993	.....	.....
Dutch	320	453	.....	.....
Hongkong	142,380	127,237	35,257	11,401
Japan	17,982	21,333	1,780	450

TABLE 8.—LIQUORS, MALT: EXPORTS, BY COUNTRIES, 1900—Continued.

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
ASIA—continued.				
Korea	720	$845	.....	.....
Russia, Asiatic	2,460	1,692	6,000	$1,400
Turkey in Asia	1,270	1,732	.....	.....
All other Asia	329	488	.....	.....
OCEANIA.				
Total	629,281	723,804	162,831	45,382
British Australasia	15,136	17,271	.....	.....
French Oceania	734	531	.....	.....
German Oceania	40	74	.....	.....
Guam	600	420	.....	.....
Hawaii	142,161	147,584	146,410	39,136
Philippine Islands	470,451	557,807	16,080	6,143
Tonga, Samoa, etc	159	117	341	103
AFRICA.				
Total	9,480	12,615	.....	.....
British Africa	5,910	7,736	.....	.....
Canary Islands	844	1,135	.....	.....
French Africa	174	245	.....	.....
Liberia	41	69	.....	.....
Portuguese Africa	911	1,282	.....	.....
Turkey in Africa—Egypt	1,600	2,148	.....	.....

It appears from Table 8 that, while the exports had a wide distribution among the countries of the world, the sales were, as a general rule, small and unimportant. The largest shipments were consigned to the countries recently acquired or occupied by the United States, viz., Hawaii, Cuba, and the Philippine Islands.

Table 9 shows the detailed statistics, by states and territories, of the manufacture of malt liquors.

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900.

	United States.	Alabama.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.	Georgia.
Number of establishments	1,509	5	99	14	20	5	4	5
Character of organization:								
Individual	535	.....	58	5	6	3	.....	.....
Firm and limited partnership	260	.....	21	2	6	.....	1	.....
Incorporated company	714	5	20	7	8	2	3	5
Capital:								
Total	$415,284,468	$820,446	$8,183,286	$5,682,204	$3,108,778	$1,126,788	$2,298,704	$1,327,330
Land	$53,611,097	$52,000	$1,212,127	$361,700	$193,761	$95,700	$261,040	$200,500
Buildings	$119,232,506	$284,000	$1,894,415	$2,246,102	$958,722	$352,569	$955,848	$823,852
Machinery, tools, and implements	$76,398,777	$335,000	$1,477,827	$1,622,500	$804,297	$193,616	$520,323	$323,380
Cash and sundries	$166,042,088	$158,446	$3,599,417	$1,451,902	$1,151,998	$484,853	$561,493	$480,098
Proprietors and firm members	1,102	.....	105	9	20	3	2	.....
Salaried officials, clerks, etc.:								
Total number	7,153	34	125	39	81	18	35	37
Total salaries	$13,046,540	$40,142	$212,684	$78,121	$132,897	$25,301	$56,104	$64,900
Officers of corporations—								
Number	1,433	8	22	10	19	3	7	11
Salaries	$4,710,692	$19,500	$37,580	$23,000	$57,000	$4,940	$10,500	$26,500
General superintendents, managers, clerks, etc.—								
Total number	5,720	26	103	29	62	15	28	26
Total salaries	$8,335,848	$20,642	$175,054	$55,121	$75,897	$20,361	$45,604	$38,400
Men:—								
Number	5,617	26	99	28	61	15	28	26
Salaries	$8,280,336	$20,642	$171,954	$54,821	$75,585	$20,361	$45,604	$38,400
Women—								
Number	103	.....	4	1	1	.....	.....	.....
Salaries	$55,512	.....	$3,100	$300	$312	.....	.....	.....
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	43,464	271	1,080	339	360	94	217	360
Least number employed at any one time during the year	36,523	211	880	303	335	77	173	250
Average number	39,532	239	950	328	344	84	191	300
Wages	$25,826,211	$75,157	$753,424	$256,764	$278,946	$56,091	$140,690	$128,288
Men, 16 years and over—								
Average number	38,885	234	940	309	342	84	191	300
Wages	$25,573,612	$73,657	$749,844	$253,114	$278,781	$56,091	$140,690	$128,288
Women, 16 years and over—								
Average number	504	5	8	.....	2	.....	.....	.....
Wages	$132,614	$1,500	$3,280	.....	$165	.....	.....	.....
Children, under 16 years—								
Average number	643	.....	2	14	.....	.....	.....	.....
Wages	$119,985	.....	$300	$3,650	.....	.....	.....	.....

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Number of establishments	16	94	42	21	26	6	16	40
Character of organization:								
Individual	10	26	10	11	8	.....	9	5
Firm and limited partnership	6	10	7	3	3	.....	.....	5
Incorporated company	.....	58	25	7	15	6	7	30
Capital:								
Total	$144,032	$32,798,080	$6,847,997	$2,420,515	$5,131,654	$3,299,326	$13,857,323	$18,136,623
Land	$22,150	$6,244,880	$666,976	$215,005	$504,115	$355,110	$589,246	$2,074,101
Buildings	$69,600	$9,255,270	$1,767,970	$973,110	$1,870,761	$1,097,483	$9,952,309	$6,226,373
Machinery, tools, and implements	$34,965	$6,579,129	$1,414,525	$417,677	$1,310,336	$500,178	$1,484,133	$4,421,247
Cash and sundries	$17,317	$10,718,801	$2,498,526	$814,723	$1,446,442	$1,346,555	$1,831,585	$5,414,902
Proprietors and firm members	19	47	26	18	14	.....	9	15
Salaried officials, clerks, etc.:								
Total number	1	578	205	58	124	57	161	322
Total salaries	$600	$1,040,689	$317,721	$84,136	$192,525	$87,556	$262,916	$639,025
Officers of corporations—								
Number	.....	123	64	15	30	12	12	45
Salaries	.....	$382,459	$147,000	$40,113	$72,899	$34,960	$41,477	$193,597
General superintendents, managers, clerks, etc.—								
Total number	1	455	141	43	94	45	149	277
Total salaries	$600	$658,230	$170,721	$44,028	$119,626	$52,596	$221,439	$445,428
Men—								
Number	1	447	136	43	91	44	149	271
Salaries	$600	$654,974	$168,273	$44,028	$118,456	$52,116	$221,439	$442,356
Women—								
Number	.....	8	5	.....	3	1	.....	6
Salaries	.....	$3,256	$2,448	.....	$1,170	$480	.....	$3,072
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	35	3,617	1,128	392	681	401	839	1,767
Least number employed at any one time during the year	29	3,013	951	287	488	350	744	1,544
Average number	29	3,269	1,045	321	591	374	752	1,651
Wages	$19,064	$2,059,792	$601,638	$189,916	$327,242	$224,985	$484,318	$1,340,412
Men, 16 years and over—								
Average number	29	3,205	1,020	317	573	353	751	1,641
Wages	$19,064	$2,047,023	$596,567	$189,366	$323,662	$221,195	$484,162	$1,336,427
Women, 16 years and over—								
Average number	.....	52	15	.....	3	7	.....	10
Wages	.....	$10,426	$3,320	.....	$364	$1,360	.....	$3,985
Children, under 16 years—								
Average number	.....	12	10	4	15	14	1	.....
Wages	.....	$2,343	$1,751	$550	$3,216	$2,430	$156	.....

	Michigan.	Minnesota.	Missouri.	Montana.	Nebraska.	Nevada.	New Hampshire.	New Jersey.
Number of establishments	77	78	49	21	19	5	5	45
Character of organization:								
Individual	25	47	11	8	10	4	.....	8
Firm and limited partnership	14	18	1	5	2	1	.....	6
Incorporated company	38	13	37	8	7	.....	5	31
Capital:								
Total	$6,235,484	$8,539,722	$25,731,930	$1,203,516	$2,678,593	$44,410	$2,047,576	$26,330,466
Land	$674,609	$2,202,783	$4,108,252	$106,030	$228,023	$3,610	$97,000	$1,559,072
Buildings	$1,806,812	$2,541,442	$8,211,376	$482,440	$775,735	$16,700	$1,084,844	$6,212,028
Machinery, tools, and implements	$1,820,343	$1,170,589	$3,535,386	$328,861	$784,728	$10,550	$443,599	$5,106,292
Cash and sundries	$1,933,720	$2,624,908	$9,876,916	$286,185	$890,107	$13,550	$422,133	$13,453,074
Proprietors and firm members	49	85	13	22	14	6	.....	18
Salaried officials, clerks, etc.:								
Total number	242	154	398	34	45	.....	34	350
Total salaries	$297,150	$218,544	$836,383	$68,280	$94,215	.....	$64,578	$818,888
Officers of corporations—								
Number	68	29	60	11	16	.....	9	69
Salaries	$118,400	$66,662	$341,600	$34,300	$57,107	.....	$14,260	$321,257
General superintendents, managers, clerks, etc.—								
Total number	174	125	338	23	29	.....	25	281
Total salaries	$178,750	$146,882	$494,783	$33,980	$37,108	.....	$50,318	$497,631
Men—								
Number	166	121	328	21	29	.....	25	280
Salaries	$175,693	$144,602	$485,303	$32,680	$37,108	.....	$50,318	$497,215
Women—								
Number	8	4	10	2	.....	.....	.....	1
Salaries	$3,057	$2,280	$9,480	$1,300	.....	.....	.....	$416
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	1,137	1,072	3,394	229	242	11	313	1,860
Least number employed at any one time during the year	887	764	3,022	186	183	10	286	1,651
Average number	980	856	3,150	193	200	11	280	1,723
Wages	$599,319	$417,832	$1,890,100	$169,066	$131,455	$8,760	$185,300	$1,360,915
Men, 16 years and over—								
Average number	955	843	3,092	181	197	11	280	1,715
Wages	$591,186	$414,895	$1,876,961	$165,030	$130,495	$8,760	$185,300	$1,358,715
Women, 16 years and over—								
Average number	25	13	23	.....	3	.....	.....	2
Wages	$8,133	$2,937	$5,425	.....	$960	.....	.....	$1,000
Children, under 16 years—								
Average number	.....	.....	35	12	.....	.....	.....	6
Wages	.....	.....	$7,714	$4,036	.....	.....	.....	$1,200

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	New Mexico.	New York.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	South Dakota.	Tennessee.
Number of establishments	3	225	112	24	208	6	4	4
Character of organization:								
Individual		50	37	17	73	1	3	1
Firm and limited partnership		41	19	3	44			
Incorporated company	3	134	56	4	91	5	1	3
Capital:								
Total	$42,500	$95,057,875	$26,822,396	$818,654	$63,684,480	$3,338,276	$560,794	$1,277,772
Land	$1,700	$13,022,037	$3,564,394	$124,340	$6,270,152	$143,711	$57,038	$111,000
Buildings	$16,000	$22,686,162	$8,592,305	$240,350	$17,290,687	$1,002,764	$148,318	$443,534
Machinery, tools, and implements	$17,800	$15,843,299	$5,651,174	$207,711	$12,476,071	$1,170,167	$120,200	$271,586
Cash and sundries	$8,000	$48,506,377	$9,014,523	$246,253	$27,647,570	$1,021,644	$235,238	$451,652
Proprietors and firm members		153	81	24	171	1	3	1
Salaried officials, clerks, etc.:								
Total number	1	1,721	547	19	816	53	10	31
Total salaries	$800	$3,673,854	$879,010	$24,200	$1,474,092	$89,674	$12,420	$51,500
Officers of corporations—								
Number	1	385	94	4	118	3	2	11
Salaries	$800	$1,511,133	$274,960	$4,100	$437,445	$20,000	$5,000	$26,200
General superintendents, managers, clerks etc.—								
Total number		1,336	453	15	698	50	8	20
Total salaries		$2,162,721	$604,050	$20,100	$1,036,647	$69,674	$7,420	$25,300
Men—								
Number		1,318	446	15	688	50	8	20
Salaries		$2,156,079	$599,516	$20,100	$1,030,063	$69,674	$7,420	$25,300
Women—								
Number		18	7		10			
Salaries		$6,642	$4,534		$6,584			
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	26	7,921	3,749	157	4,791	322	70	224
Least number employed at any one time during the year	8	7,081	3,161	113	4,159	274	54	249
Average number	14	7,424	3,464	136	4,505	296	61	288
Wages	$8,387	$5,630,996	$2,292,652	$106,041	$2,884,242	$223,712	$23,949	$129,782
Men, 16 years and over—								
Average number	14	7,409	3,420	133	4,490	296	58	281
Wages	$8,387	$5,627,656	$2,284,958	$105,341	$2,881,215	$223,712	$22,949	$126,982
Women, 16 years and over—								
Average number		13	5		6			
Wages		$2,620	$852		$1,346			
Children, under 16 years—								
Average number		2	39	3	9		3	7
Wages		$720	$6,842	$700	$1,681		$1,000	$2,800

	Texas.	Utah.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states.[1]
Number of establishments	9	7	6	25	8	147	4	5
Character of organization:								
Individual	2	1		10	2	73	1	
Firm and limited partnership		3		4		32	1	2
Incorporated company	7	3	6	11	6	42	2	3
Capital:								
Total	$4,439,012	$613,992	$2,000,954	$1,506,762	$1,714,050	$35,317,950	$86,801	$498,467
Land	$295,635	$154,374	$208,179	$147,750	$109,811	$7,316,144	$9,625	$47,417
Buildings	$1,156,821	$98,999	$700,419	$458,689	$463,308	$8,342,994	$25,500	$206,905
Machinery, tools, and implements	$1,099,179	$118,341	$410,563	$343,461	$366,009	$3,515,536	$26,400	$122,249
Cash and sundries	$1,887,377	$242,278	$681,793	$556,862	$774,922	$18,143,276	$24,776	$121,896
Proprietors and firm members	2	4		19	2	139	3	5
Salaried officials, clerks, etc.:								
Total number	98	22	72	53	60	484	2	32
Total salaries	$180,619	$21,178	$95,458	$81,830	$70,803	$726,069	$2,400	$34,328
Officers of corporations—								
Number	11	1	19	22	9	102	2	6
Salaries	$45,100	$1,800	$30,760	$42,000	$16,920	$234,063	$2,400	$12,900
General superintendents, managers, clerks, etc.—								
Total number	87	21	53	31	51	382		26
Total salaries	$135,519	$19,378	$64,698	$39,830	$53,883	$492,006		$21,428
Men—								
Number	84	20	52	30	51	374		26
Salaries	$133,411	$18,478	$64,398	$39,230	$53,883	$488,833		$21,428
Women—								
Number	3	1	1	1		8		
Salaries	$2,108	$900	$300	$600		$3,173		
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	668	102	343	242	300	4,451	20	139
Least number employed at any one time during the year	502	72	251	192	219	3,536	18	109
Average number	585	89	300	211	256	3,904	19	124
Wages	$354,682	$53,751	$144,882	$171,456	$117,320	$1,926,730	$12,300	$45,855
Men, 16 years and over—								
Average number	555	83	300	210	256	3,178	19	120
Wages	$349,351	$52,591	$144,882	$171,206	$117,320	$1,779,594	$12,300	$44,895
Women, 16 years and over—								
Average number	6					306		
Wages	$471					$84,470		
Children, under 16 years—								
Average number	24	6		1		420		4
Wages	$4,860	$1,160		$250		$71,666		$960

[1] Includes establishments distributed as follows: Arkansas, 1; Florida, 1; Kansas, 2; South Carolina, 1.

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	United States.	Alabama.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.	Georgia.
Average number of wage-earners, including piece-workers, employed during each month:								
Men, 16 years and over—								
January	37,018	219	887	301	336	77	174	260
February	36,897	222	912	293	334	78	174	264
March	37,437	216	938	296	336	82	173	277
April	38,283	231	984	303	335	82	186	291
May	39,348	256	968	315	339	86	196	324
June	39,709	257	991	319	347	87	195	347
July	39,875	258	972	321	353	90	217	350
August	39,901	259	983	320	356	89	214	326
September	39,448	254	950	318	349	88	205	320
October	38,322	215	932	311	345	86	191	284
November	37,314	214	890	308	341	88	182	285
December	37,114	205	868	304	339	82	181	270
Women, 16 years and over—								
January	434	4	2	.....	1	.....	.....	.....
February	442	4	8	.....	1	.....	.....	.....
March	465	4	12	.....	1	.....	.....	.....
April	499	5	17	.....	1	.....	.....	.....
May	507	6	8	.....	1	.....	.....	.....
June	529	6	7	.....	3	.....	.....	.....
July	539	6	2	.....	3	.....	.....	.....
August	579	6	7	.....	3	.....	.....	.....
September	548	6	2	.....	3	.....	.....	.....
October	535	4	14	.....	1	.....	.....	.....
November	503	4	8	.....	1	.....	.....	.....
December	471	4	10	.....	1	.....	.....	.....
Children, under 16 years—								
January	513	.....	2	15	.....	.....	.....	.....
February	527	.....	2	12	.....	.....	.....	.....
March	585	.....	2	12	.....	.....	.....	.....
April	676	.....	2	12	.....	.....	.....	.....
May	719	.....	2	17	.....	.....	.....	.....
June	757	.....	2	17	.....	.....	.....	.....
July	751	.....	2	17	.....	.....	.....	.....
August	773	.....	2	17	.....	.....	.....	.....
September	731	.....	2	15	.....	.....	.....	.....
October	601	.....	2	12	.....	.....	.....	.....
November	552	.....	2	12	.....	.....	.....	.....
December	529	.....	2	12	.....	.....	.....	.....

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Average number of wage-earners, including piece-workers, employed during each month:								
Men, 16 years and over—								
January	27	3,113	941	335	433	329	757	1,588
February	27	3,090	934	312	485	330	757	1,581
March	29	3,129	967	294	495	335	768	1,598
April	29	3,197	1,028	302	527	334	775	1,619
May	30	3,238	1,063	310	628	379	815	1,663
June	30	3,249	1,085	325	636	380	730	1,672
July	32	3,294	1,096	325	656	379	743	1,710
August	30	3,322	1,093	323	653	377	742	1,708
September	31	3,301	1,082	321	627	376	743	1,686
October	30	3,273	1,040	303	579	341	732	1,635
November	26	3,151	966	306	557	338	725	1,615
December	28	3,109	948	349	549	335	728	1,618
Women, 16 years and over—								
January	.....	42	13	.....	3	7	.....	10
February	.....	42	13	.....	3	7	.....	11
March	.....	42	17	.....	3	7	.....	11
April	.....	47	17	.....	3	7	.....	11
May	.....	56	15	.....	3	7	.....	11
June	.....	62	15	.....	3	7	.....	11
July	.....	67	17	.....	4	7	.....	11
August	.....	60	17	.....	4	7	.....	11
September	.....	58	17	.....	3	7	.....	11
October	.....	55	17	.....	3	7	.....	11
November	.....	47	13	.....	3	7	.....	8
December	.....	52	13	.....	3	7	.....	1
Children, under 16 years—								
January	.....	3	5	3	9	14	1	.....
February	.....	2	5	3	9	14	1	.....
March	.....	2	5	4	12	14	1	.....
April	.....	10	10	3	13	14	1	.....
May	.....	18	12	5	19	14	1	.....
June	.....	23	12	4	20	14	1	.....
July	.....	18	12	4	19	14	1	.....
August	.....	22	13	4	19	14	1	.....
September	.....	19	11	3	18	14	1	.....
October	.....	15	11	3	17	14	1	.....
November	.....	3	11	4	15	14	1	.....
December	.....	3	11	3	15	14	1	.....

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Michigan.	Minnesota.	Missouri.	Montana.	Nebraska.	Nevada.	New Hampshire.	New Jersey.
Average number of wage-earners, including piece-workers, employed during each month:								
Men, 16 years and over—								
January	875	905	2,990	168	196	11	287	1,710
February	900	800	3,028	168	183	11	287	1,702
March	893	780	3,046	173	182	11	289	1,708
April	928	801	3,080	196	195	11	294	1,721
May	993	838	3,218	202	201	11	298	1,756
June	1,031	883	3,178	185	217	11	282	1,713
July	1,053	926	3,096	184	208	11	256	1,766
August	1,044	894	3,209	182	207	11	254	1,762
September	1,009	859	3,199	184	207	11	268	1,740
October	953	813	3,060	188	196	11	273	1,693
November	896	784	3,018	177	185	10	291	1,656
December	885	838	2,987	171	183	10	291	1,654
Women, 16 years and over—								
January	19	14	21	.....	3	.....	.....	2
February	19	14	21	.....	3	.....	.....	2
March	21	14	24	.....	3	.....	.....	2
April	22	15	24	.....	3	.....	.....	2
May	28	13	23	.....	3	.....	.....	2
June	33	12	24	.....	3	.....	.....	2
July	35	16	24	.....	3	.....	.....	2
August	32	11	23	.....	3	.....	.....	2
September	26	11	22	.....	3	.....	.....	2
October	25	11	22	.....	3	.....	.....	2
November	20	11	22	.....	3	.....	.....	2
December	19	15	22	.....	3	.....	.....	2
Children, under 16 years—								
January	.....	.....	31	8	.....	.....	.....	5
February	.....	.....	29	8	.....	.....	.....	5
March	.....	.....	32	8	.....	.....	.....	5
April	.....	.....	32	12	.....	.....	.....	6
May	.....	.....	38	14	.....	.....	.....	7
June	.....	.....	38	14	.....	.....	.....	7
July	.....	.....	40	15	.....	.....	.....	7
August	.....	.....	40	15	.....	.....	.....	7
September	.....	.....	39	15	.....	.....	.....	6
October	.....	.....	35	14	.....	.....	.....	5
November	.....	.....	33	8	.....	.....	.....	5
December	.....	.....	35	8	.....	.....	.....	5

	New Mexico.	New York.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	South Dakota.	Tennessee.
Average number of wage-earners, including piece-workers, employed during each month:								
Men, 16 years and over—								
January	8	7,336	3,236	121	4,302	284	47	249
February	8	7,343	3,239	121	4,311	278	47	244
March	8	7,349	3,334	127	4,345	274	53	271
April	9	7,396	3,406	134	4,423	289	54	288
May	11	7,479	3,510	142	4,574	313	66	290
June	21	7,527	3,553	143	4,713	274	65	310
July	22	7,492	3,603	146	4,728	282	65	304
August	26	7,446	3,592	147	4,706	302	65	304
September	22	7,393	3,558	145	4,614	321	65	304
October	15	7,410	3,420	132	4,478	319	68	280
November	6	7,372	3,325	123	4,358	313	58	268
December	6	7,367	3,269	119	4,329	300	52	260
Women, 16 years and over—								
January	.....	8	2	.....	6	.....	.....	.....
February	.....	12	2	.....	6	.....	.....	.....
March	.....	11	4	.....	6	.....	.....	.....
April	.....	14	6	.....	6	.....	.....	.....
May	.....	14	6	.....	6	.....	.....	.....
June	.....	15	6	.....	6	.....	.....	.....
July	.....	14	6	.....	6	.....	.....	.....
August	.....	14	6	.....	7	.....	.....	.....
September	.....	15	6	.....	6	.....	.....	.....
October	.....	12	6	.....	6	.....	.....	.....
November	.....	15	6	.....	8	.....	.....	.....
December	.....	15	2	.....	9	.....	.....	.....
Children, under 16 years—								
January	.....	2	24	1	6	.....	2	5
February	.....	2	22	1	7	.....	2	5
March	.....	2	31	3	6	.....	3	5
April	.....	2	38	3	5	.....	3	10
May	.....	2	43	3	9	.....	4	10
June	.....	2	42	4	13	.....	4	10
July	.....	2	52	4	14	.....	4	10
August	.....	2	53	4	13	.....	4	10
September	.....	2	50	3	13	.....	4	10
October	.....	2	42	2	10	.....	3	5
November	.....	2	35	2	8	.....	3	5
December	.....	2	32	2	3	.....	2	5

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Texas.	Utah.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states,[1]
Average number of wage-earners, including piece-workers, employed during each month:								
Men, 16 years and over—								
January	487	69	256	188	231	3,109	17	109
February	486	78	253	195	233	3,068	17	109
March	521	82	282	203	248	3,194	18	113
April	527	87	303	211	251	3,265	18	123
May	586	90	318	220	262	3,216	19	125
June	606	95	343	223	278	3,257	19	132
July	626	91	343	228	286	3,211	20	132
August	614	91	334	228	284	3,252	20	130
September	601	87	321	224	274	3,258	20	128
October	586	79	308	213	244	3,160	20	116
November	520	72	268	197	239	3,064	17	110
December	503	75	270	191	236	3,076	17	112
Women, 16 years and over—								
January	6	.....	.....	.....	.....	271	.....	.....
February	6	.....	.....	.....	.....	268	.....	.....
March	6	.....	.....	.....	.....	277	.....	.....
April	6	.....	.....	.....	.....	293	.....	.....
May	6	.....	.....	.....	.....	304	.....	.....
June	6	.....	.....	.....	.....	308	.....	.....
July	6	.....	.....	.....	.....	310	.....	.....
August	6	.....	.....	.....	.....	360	.....	.....
September	6	.....	.....	.....	.....	344	.....	.....
October	6	.....	.....	.....	.....	330	.....	.....
November	6	.....	.....	.....	.....	324	.....	.....
December	6	.....	.....	.....	.....	287	.....	.....
Children, under 16 years—								
January	20	6	.....	1	.....	348	.....	2
February	22	6	.....	1	.....	365	.....	4
March	23	6	.....	1	.....	406	.....	2
April	28	6	.....	1	.....	459	.....	6
May	25	6	.....	1	.....	463	.....	6
June	26	6	.....	1	.....	491	.....	6
July	30	6	.....	1	.....	478	.....	6
August	24	6	.....	1	.....	497	.....	5
September	26	6	.....	1	.....	468	.....	5
October	22	6	.....	1	.....	375	.....	4
November	22	6	.....	1	.....	358	.....	2
December	22	6	.....	1	.....	343	.....	2

	United States.	Alabama.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.	Georgia.
Miscellaneous expenses:								
Total	$109,329,231	$150,039	$2,126,734	$885,518	$1,156,308	$285,662	$650,902	$410,745
Rent of works	$804,665	.....	$11,370	.....	$5,800	.....	$2,400	.....
Taxes, not including internal revenue	$2,431,195	$6,342	$41,725	$30,678	$21,146	$8,451	$7,933	$9,903
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$106,537,764	$143,697	$2,073,639	$804,526	$1,129,362	$282,211	$640,569	$400,842
Contract work	$55,607	.....	.....	$314	.....	.....	.....	.....
Materials used:								
Total cost	$51,674,928	$184,653	$1,276,575	$375,893	$639,555	$123,327	$286,653	$275,747
Malt, bushels	36,385,365	86,550	312,173	70,754	599,276	123,996	241,754	174,218
Cost	$20,539,308	$48,485	$213,606	$45,270	$349,402	$83,906	$157,541	$110,321
Corn, in partially manufactured form, pounds	483,998,984	1,282,000	3,289,180	4,718,280	5,927,520	464,280	4,489,754	364,534
Cost	$4,805,887	$10,500	$56,480	$82,712	$63,068	$5,358	$40,765	$9,093
Barley, bushels	11,232,599	.....	865,792	194,611	.....	.....	3,246	.....
Cost	$5,554,669	.....	$493,829	$100,449	.....	.....	$1,623	.....
Hops, pounds	37,465,811	59,000	812,426	215,312	590,447	98,950	190,522	114,479
Cost	$5,858,265	$9,230	$111,088	$35,860	$73,090	$16,894	$34,001	$19,652
Fuel	$4,727,891	$23,726	$190,807	$38,365	$55,699	$8,970	$25,692	$40,940
Rent of power and heat	$15,107	.....	$3,189	.....	$80	.....	$342	.....
Mill supplies	$599,479	$4,625	$12,048	$3,742	$11,995	$1,323	$7,242	$3,346
All other materials	$8,742,771	$32,787	$177,256	$73,258	$76,270	$6,852	$14,310	$73,802
Freight	$831,551	$5,300	$18,322	$26,237	$9,951	$24	$5,137	$18,593
Products:								
Total value	$237,269,718	$481,640	$5,085,462	$2,042,863	$2,652,819	$616,496	$1,340,041	$973,212
Beer, ale, and porter, barrels of 31 gallons	38,664,584	60,707	748,917	272,869	425,266	103,880	213,939	124,025
Value	$234,275,259	$441,692	$4,987,367	$2,025,627	$2,618,138	$609,097	$1,297,443	$938,644
All other products	$2,994,454	$39,948	$98,095	$17,236	$34,681	$7,399	$42,598	$34,568
Comparison of products:								
Number of establishments reporting for both years	1,226	4	76	12	18	4	3	5
Value for census year	$216,203,898	$465,340	$4,565,710	$2,029,485	$2,324,398	$616,496	$1,174,973	$973,212
Value for preceding business year	$198,543,002	$409,000	$4,431,118	$1,785,286	$2,110,968	$568,154	$891,940	$952,947

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Miscellaneous expenses:								
Total	$26,195	$9,927,696	$2,534,285	$736,550	$1,500,606	$792,468	$1,568,108	$4,731,540
Rent of works	$540	$4,260	$715	$15,050	$1,760	.....	$2,914	$324
Taxes, not including internal revenue	$2,637	$189,690	$52,042	$12,775	$30,222	$42,621	$25,839	$115,575
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$23,018	$9,718,746	$2,481,528	$708,725	$1,468,624	$749,847	$1,539,355	$4,614,343
Contract work	.....	$15,000	.....	.....	.....	.....	.....	$998
Materials used:								
Total cost	$19,301	$4,036,178	$1,127,079	$385,164	$630,969	$408,440	$878,933	$2,843,050
Malt, bushels	5,124	3,189,654	713,683	216,849	397,358	279,298	711,024	2,299,215
Cost	$4,334	$1,572,057	$396,103	$118,671	$223,806	$167,332	$427,401	$1,895,624
Corn, in partially manufactured form, pounds	.....	70,500,228	16,749,722	3,302,924	6,455,588	2,165,390	10,965,513	14,388,968
Cost	.....	$584,260	$154,834	$28,620	$59,118	$20,565	$124,118	$165,114

[1] Includes establishment distributed as follows: Arkansas, 1; Florida, 1; Kansas, 2; South Carolina, 1.

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Materials used—Continued.								
Total cost—Continued.								
Barley, bushels	8,407	998,117	229,435	228,926	110,000	.....	.....	.....
Cost	$4,558	$463,520	$121,744	$87,762	$54,860	.....	.....	.....
Hops, pounds	11,019	3,100,409	751,064	253,949	337,492	205,833	591,341	2,457,654
Cost	$1,711	$468,390	$116,044	$37,112	$71,420	$42,604	$97,289	$367,019
Fuel	$2,270	$400,828	$183,064	$53,860	$61,187	$54,899	$72,941	$220,071
Rent of power and heat	.....	$76	.....	.....	.....	.....	.....	.....
Mill supplies	$240	$47,735	$16,810	$2,733	$5,583	$3,499	$9,108	$22,123
All other materials	$4,115	$464,427	$104,590	$41,976	$154,751	$104,303	$147,751	$590,732
Freight	$2,073	$34,885	$23,890	$14,430	$244	$10,238	$325	$82,367
Products:								
Total value	$74,868	$19,733,821	$5,777,047	$1,718,911	$3,186,627	$1,472,062	$4,133,797	$11,255,613
Beer, ale, and porter, barrels of 31 gallons.	8,875	3,794,782	857,332	252,814	499,009	241,108	694,769	1,731,608
Value	$71,918	$19,530,322	$5,733,145	$1,625,876	$3,145,759	$1,448,549	$4,104,506	$11,175,068
All other products	$2,950	$203,499	$43,902	$88,035	$40,868	$23,513	$29,291	$80,545
Comparison of products:								
Number of establishments reporting for both years	11	100	35	18	24	4	13	34
Value for census year	$56,219	$19,012,851	$4,662,349	$1,402,123	$3,120,440	$1,244,298	$3,938,971	$9,661,069
Value for preceding business year	$50,284	$17,353,916	$4,958,572	$1,173,906	$2,735,925	$1,346,056	$3,903,542	$9,285,800

	Michigan.	Minnesota.	Missouri.	Montana.	Nebraska.	Nevada.	New Hampshire.	New Jersey.
Miscellaneous expenses:								
Total	$2,402,652	$1,996,040	$6,137,846	$433,577	$635,031	$6,935	$778,198	$6,733,772
Rent of works	$51,767	$646	$31,874	$600	$3,180	.....	.....	$5,520
Taxes, not including internal revenue	$61,076	$39,332	$151,076	$12,961	$14,694	$715	$36,003	$112,564
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$2,289,809	$1,927,987	$5,954,896	$420,016	$617,157	$6,220	$742,195	$6,615,688
Contract work	.....	$28,075	.....	.....	.....	.....	.....	.....
Materials used:								
Total cost	$1,187,770	$867,901	$3,073,011	$375,631	$311,783	$9,240	$599,144	$2,782,420
Malt, bushels	927,748	216,193	2,233,512	89,761	218,639	4,937	468,033	2,110,649
Cost	$509,146	$129,659	$1,064,297	$60,158	$121,715	$4,971	$298,019	$1,114,655
Corn, in partially manufactured form, pounds	14,955,434	6,053,391	7,337,595	1,080,572	4,056,210	.....	1,304,015	24,656,416
Cost	$166,402	$56,462	$65,017	$17,129	$35,922	.....	$16,552	$250,364
Barley, bushels	189,197	561,616	562,343	146,499	37,265	.....	200,000	588,079
Cost	$92,196	$238,173	$270,467	$102,328	$17,716	.....	$120,000	$303,531
Hops, pounds	789,298	502,527	2,114,888	159,091	210,870	5,088	656,171	2,030,528
Cost	$114,761	$84,561	$457,596	$20,264	$27,181	$693	$91,730	$332,669
Fuel	$112,670	$92,521	$315,912	$35,628	$35,688	$2,110	$38,796	$200,672
Rent of power and heat	$16	$1,500	$3,100	$240	.....	.....	$150	.....
Mill supplies	$11,716	$9,459	$25,773	$2,635	$1,754	.....	$5,237	$51,140
All other materials	$145,276	$221,044	$862,132	$88,964	$68,536	$295	$25,629	$458,566
Freight	$35,587	$34,522	$8,717	$48,285	$3,271	$1,171	$3,031	$70,823
Products:								
Total value	$5,296,825	$4,456,928	$13,776,905	$1,276,331	$1,433,501	$29,216	$1,955,628	$14,386,456
Beer, ale, and porter, barrels of 31 gallons.	911,268	683,124	2,410,999	149,697	218,161	2,417	312,661	2,117,491
Value	$5,259,958	$4,451,444	$13,484,470	$1,263,906	$1,433,001	$29,216	$1,951,000	$14,287,345
All other products	$36,867	$5,484	$292,435	$12,425	$500	.....	$4,628	$99,111
Comparison of products:								
Number of establishments reporting for both years	66	56	32	16	14	5	5	31
Value for census year	$4,981,878	$4,105,361	$12,297,760	$1,181,064	$1,414,973	$29,216	$1,955,628	$13,996,136
Value for preceding business year	$4,568,181	$3,625,648	$11,545,381	$888,310	$1,361,470	$26,100	$1,798,761	$13,260,965

	New Mexico.	New York.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	South Dakota.	Tennessee.
Miscellaneous expenses:								
Total	$11,456	$26,954,024	$8,104,240	$215,584	$18,039,371	$859,619	$78,216	$517,278
Rent of works	$300	$92,860	$12,120	$200	$52,307	.....	.....	.....
Taxes, not including internal revenue	$473	$566,136	$217,434	$9,756	$335,268	$14,907	$1,417	$15,421
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$10,683	$26,290,528	$7,874,686	$205,628	$12,651,551	$844,712	$76,754	$501,857
Contract work	.....	$4,500	.....	.....	$250	.....	$45	.....
Materials used:								
Total cost	$7,312	$11,418,383	$4,277,812	$172,615	$6,609,889	$453,406	$37,843	$262,437
Malt, bushels	5,635	9,605,158	2,790,141	53,581	5,618,139	422,983	5,023	184,453
Cost	$8,090	$5,574,099	$1,551,085	$38,511	$3,333,710	$250,339	$2,792	$88,659
Corn, in partially manufactured form, pounds	.....	120,830,084	32,162,333	272,720	57,381,614	2,389,380	541,470	1,152,080
Cost	.....	$1,203,377	$336,089	$4,396	$638,224	$24,102	$6,324	$16,076
Barley, bushels	.....	1,256,548	1,227,437	91,986	123,000	.....	36,132	.....
Cost	.....	$650,668	$618,760	$52,935	$64,130	.....	$12,585	.....
Hops, pounds	3,100	10,000,156	2,944,523	90,699	4,557,446	407,359	22,022	147,478
Cost	$365	$1,390,616	$511,869	$12,907	$686,327	$44,668	$3,387	$23,551
Fuel	$1,200	$896,921	$382,156	$27,584	$523,957	$49,112	$5,660	$18,912
Rent of power and heat	.....	$1,884	.....	.....	.....	.....	.....	.....
Mill supplies	$175	$130,956	$50,677	$4,734	$78,697	$14,923	$805	$3,718
All other materials	$1,532	$1,482,863	$744,207	$22,220	$1,178,322	$65,592	$6,035	$107,021
Freight	$950	$86,999	$82,969	$9,328	$116,522	$4,670	$755	$4,500
Products:								
Total value	$37,136	$56,137,854	$18,522,639	$714,242	$20,162,743	$1,880,171	$280,080	$1,175,804
Beer, ale, and porter, barrels of 31 gallons.	3,698	9,593,085	3,028,116	87,002	4,648,172	332,916	34,810	144,625
Value	$35,776	$55,967,887	$18,239,356	$696,866	$28,981,891	$1,867,881	$278,980	$1,167,580
All other products	$1,360	$169,967	$283,283	$17,376	$180,852	$12,290	$1,100	$7,724
Comparison of products:								
Number of establishments reporting for both years	1	201	99	20	143	4	3	4
Value for census year	$30,360	$53,603,204	$17,718,861	$697,102	$21,923,133	$1,177,662	$264,080	$1,175,304
Value for preceding business year	$33,000	$52,079,358	$14,829,552	$615,501	$19,766,566	$1,133,956	$134,226	$1,129,688

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Texas.	Utah.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states.[1]
Miscellaneous expenses:								
Total	$1,210,381	$123,838	$374,865	$385,884	$492,611	$10,259,291	$18,710	$126,456
Rent of works	$2,120	$60		$2,022	$300	$3,656		
Taxes, not including internal revenue	$28,107	$6,369	$8,299	$9,681	$20,707	$171,379	$900	$3,646
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$1,180,154	$116,559	$366,566	$374,181	$471,129	$10,079,156	$17,810	$122,810
Contract work		$850			$475	$5,100		
Materials used:								
Total cost	$646,794	$120,995	$215,923	$294,565	$197,724	$4,237,454	$11,748	$66,611
Malt, bushels	399,082		136,208	174,846	201,293	1,058,653	6,300	33,477
Cost	$217,350		$80,370	$115,997	$116,451	$524,741	$4,960	$20,675
Corn, in partially manufactured form, pounds	5,212,020	100,000	1,777,640	1,826,715	2,895,580	52,464,764	44,270	490,300
Cost	$55,017	$1,250	$16,708	$27,110	$24,786	$464,380	$1,443	$4,252
Barley, bushels		69,168	19,280	60,439		3,410,581	1,495	13,000
Cost		$40,325	$11,375	$27,988		$1,596,125	$922	$6,100
Hops, pounds	302,557	48,220	139,223	142,258		2,369,345	6,953	26,014
Cost	$53,665	$7,321	$21,502	$21,800		$444,778	$812	$3,838
Fuel	$132,387	$12,007	$31,530	$29,932	$18,799	$358,208	$950	$21,260
Rent of power and heat				$4,315		$215		
Mill supplies	$6,440	$791	$4,358	$5,241	$1,743	$40,923	$260	$672
All other materials	$166,531	$50,708	$46,056	$53,397	$35,270	$780,349	$1,595	$8,451
Freight	$15,404	$8,593	$4,024	$8,785	$725	$27,735	$806	$1,363
Products:								
Total value	$2,689,606	$432,835	$972,820	$1,230,525	$1,118,021	$19,394,709	$52,540	$321,419
Beer, ale, and porter, barrels of 31 gallons	366,274	45,583	141,555	157,225	152,064	3,049,191	6,097	38,503
Value	$2,440,026	$431,630	$920,620	$1,220,427	$1,061,534	$18,707,752	$46,340	$297,222
All other products	$249,580	$1,205	$52,200	$10,098	$51,487	$686,957	$6,200	$24,197
Comparison of products:								
Number of establishments reporting for both years	7	7	6	17	5	116	4	3
Value for census year	$1,953,850	$432,835	$972,820	$1,024,169	$1,042,037	$18,745,838	$52,540	$180,203
Value for preceding business year	$1,563,715	$352,596	$855,272	$819,166	$1,016,747	$14,958,239	$48,145	$175,050

	United States.	Alabama.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.	Georgia.
Power:								
Number of establishments reporting	1,333	5	66	13	19	3	4	4
Total horsepower	204,533	1,046	3,624	1,057	2,219	480	1,823	1,385
Owned—								
Engines—								
Steam, number	4,123	22	99	34	46	12	21	16
Horsepower	195,430	1,046	3,382	1,050	2,115	462	1,697	1,360
Gas or gasoline, number	29		2		1		1	
Horsepower	394		6		10		10	
Water wheels, number	27		8					
Horsepower	319		28					
Electric motors, number	469		6	1	8	1	11	1
Horsepower	6,632		19	7	85	10	51	25
Other power, number	70						17	
Horsepower	1,159						65	
Rented—								
Electric, horsepower	540		185		9	8		
Other kind, horsepower	59		4					
Furnished to other establishments, horsepower	401							
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	1,524	5	99	14	20	5	4	5
No employees	43		12	1				
Under 5	304		39	3	4	2		
5 to 20	523		35	5	7			
21 to 50	349	2	7	2	9	3	2	
51 to 100	176	2	3	2			1	4
101 to 250	94	1	3	1			1	1
251 to 500	19							
501 to 1,000	15							
Over 1,000	1							

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Power:								
Number of establishments reporting	5	90	37	18	25	6	10	39
Total horsepower	82	18,596	5,037	2,307	3,238	1,813	4,650	6,869
Owned—								
Engines—								
Steam, number	6	301	104	42	68	44	103	152
Horsepower	82	17,509	5,003	2,262	3,015	1,813	4,650	6,719
Gas or gasoline, number		1	1					
Horsepower		2	6					
Water wheels, number								
Horsepower								
Electric motors, number								
Horsepower		56	3	5	13			15
Other power, number		1,085	28	45	113			150
Horsepower					5			
Rented—					110			
Electric, horsepower								
Other kind, horsepower								
Furnished to other establishments, horsepower						12		

[1] Includes establishments distributed as follows: Arkansas, 1; Florida, 1; Kansas, 2; South Carolina, 1.

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Idaho.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maryland.	Massachusetts.
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	16	109	42	21	26	6	16	40
No employees	3	1	3					
Under 5	11	12	7	3	3		4	3
5 to 20	2	32	14	10	11		3	3
21 to 50		25	12	6	7	3	4	17
51 to 100		12	3	1	3	2	2	15
101 to 250		15	2	1	2	1	2	2
251 to 500			1				1	
501 to 1,000		12						
Over 1,000								

	Michigan.	Minnesota.	Missouri.	Montana.	Nebraska.	Nevada.	New Hampshire.	New Jersey.
Power:								
Number of establishments reporting	71	67	37	18	14	2	5	36
Total horsepower	4,861	2,939	14,499	1,040	964	18	1,336	8,733
Owned—								
Engines—								
Steam, number	140	96	183	39	28	1	24	232
Horsepower	4,809	2,874	13,542	1,033	964	10	1,293	8,565
Gas or gasoline, number		1	2			1	1	1
Horsepower		15	62			3	35	1
Water wheels, number	1		2					
Horsepower	5		3					
Electric motors, number	3	3	69	1				11
Horsepower	43	50	855	2				167
Other power, number	2							
Horsepower	4							
Rented—								
Electric, horsepower				5			8	
Other kind, horsepower			37					
Furnished to other establishments, horsepower	4		240					
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	77	78	49	21	19	5	5	45
No employees	1	6	2	1		1		
Under 5	16	29	3	6	7	3		4
5 to 20	39	33	15	10	7	1		11
21 to 50	17	7	7	4	4		4	10
51 to 100	2	1	6		1			9
101 to 250		1	14				1	4
251 to 500	2	1	1					7
501 to 1,000			1					
Over 1,000								

	New Mexico.	New York.	Ohio.	Oregon.	Pennsylvania.	Rhode Island.	South Dakota.	Tennessee.
Power:								
Number of establishments reporting	2	216	109	17	194	6	4	4
Total horsepower	62	33,941	21,157	1,085	30,335	2,045	218	1,350
Owned—								
Engines—								
Steam, number	3	696	394	34	669	23	7	35
Horsepower	62	33,061	20,742	1,048	29,269	1,126	214	1,270
Gas or gasoline, number		3	1	1	6			
Horsepower		5	5	2	200			
Water wheels, number		3	4	1				
Horsepower		95	113	10				
Electric motors, number		88	33	1	35	8		2
Horsepower		676	297	25	863	78		80
Other power, number						43	1	
Horsepower						841	4	
Rented—								
Electric, horsepower		89						
Other kind, horsepower		15			3			
Furnished to other establishments, horsepower		125			10			
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	3	225	112	24	208	6	4	4
No employees		3		4	1			
Under 5	2	24	12	11	20		1	
5 to 20	1	56	46	7	94		2	
21 to 50		72	31	2	61	4		1
51 to 100		54	13		25	1	1	1
101 to 250		13	7		7	1		2
251 to 500		3	3					
501 to 1,000								
Over 1,000								

TABLE 9.—LIQUORS, MALT, BY STATES AND TERRITORIES: 1900—Continued.

	Texas.	Utah.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states.[1]
Power:								
Number of establishments reporting	7	5	6	19	8	134	3	5
Total horsepower	5,853	266	1,870	1,047	539	15,167	59	928
Owned—								
Engines—								
Steam, number	62	10	36	26	19	274	5	16
Horsepower	5,771	266	1,735	761	519	13,354	59	908
Gas or gasoline, number						6		
Horsepower						32		
Water wheels, number				3		5		
Horsepower				54		11		
Electric motors, number	9				1	84		1
Horsepower	82				20	1,766		10
Other power, number			2					
Horsepower			135					
Rented—								
Electric, horsepower				232		4		
Other kind, horsepower								
Furnished to other establishments, horsepower	10							
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	9	7	6	25	8	147	4	5
No employees	1			1		2		
Under 5	1	3		10	1	58	2	
5 to 20		2		9	3	61	2	2
21 to 50		1	3	4	2	14		2
51 to 100	2	1	2	1		5		1
101 to 250	5		1		2	4		
251 to 500								
501 to 1,000						2		
Over 1,000						1		

[1] Includes establishments distributed as follows: Arkansas, 1; Florida, 1; Kansas, 2; South Carolina, 1.

THE MANUFACTURE OF DISTILLED LIQUORS.

Table 10 shows the totals for the manufacture of distilled liquors as reported at the censuses of 1850 to 1900, inclusive, with the percentages of increase or decrease for the successive decades.

TABLE 10.—LIQUORS, DISTILLED: COMPARATIVE SUMMARY, 1850 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870	1850 to 1860
Number of establishments	967	440	844	719	1,215	968	119.8	[1]47.9	17.4	[1]40.8	25.5
Capital	$82,551,604	$31,006,176	$24,247,595	$15,545,116	$12,445,675	$5,409,334	5.0	27.9	56.0	24.9	130.1
Salaried officials, clerks, etc., number	661	[2]581	[3]	[3]	[3]	[3]	13.8				
Salaries	$889,606	[2]$568,825	[3]	[3]	[3]	[3]	56.4				
Wage-earners, average number	3,722	4,762	6,502	5,131	5,624	4,008	[1]21.8	[1]26.8	26.7	[1]8.8	40.3
Total wages	$1,733,218	$2,246,004	$2,663,967	$2,019,810	$1,835,513	$1,089,864	[1]22.8	[1]15.7	31.9	10.0	68.4
Men, 16 years and over	3,623	4,753	6,452	5,068	5,613	3,985	[1]23.8	[1]26.3	27.3	[1]9.7	40.9
Wages	$1,715,552	$2,245,034	[3]	[3]	[3]	[3]	[1]23.6				
Women, 16 years and over	81	3	10	6	11	23	2,600.0	[1]70.0	66.7	[1]45.5	[1]52.2
Wages	$15,428	$390	[3]	[3]	[3]	[3]	3,855.9				
Children, under 16 years	18	6	40	57	[3]	[3]	200.0	[1]85.0	[1]29.8		
Wages	$2,238	$640	[3]	[3]	[3]	[3]	249.7				
Miscellaneous expenses	$73,218,227	$65,179,927	[4]	[4]	[4]		12.3				
Cost of materials used	$15,147,784	$14,909,173	$27,744,245	$19,729,432	$21,897,775	$10,543,201	1.6	[1]46.3	40.6	19.9	107.7
Value of products	$96,798,443	$104,197,869	$41,063,663	$36,191,133	$30,936,585	$15,770,240	[1]7.1	153.7	13.5	17.0	96.2

[1] Decrease.
[2] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 16.)
[3] Not reported separately.
[4] Not reported.

As a rule, statistical inquiries of the Census Office pertaining to the value of manufactures contemplate value of products at factories, put up in marketable form and ready for shipment. If this principle were uniformly observed, the value of distillates would be placed upon them when in barrels, kegs, or other packages, with the necessary revenue stamps affixed, so that such value would always include the revenue tax. The values of products at different censuses would then be difficult to compare, because the tax varies with each legislative enactment. Since 1865 the tax on each proof gallon of distilled spirits has varied from 50 cents to $2, or from two to six times the value of the spirits alone.

The revenue, however, is not always included in reporting values. Distillers of grain or molasses must, in accordance with Government regulations, provide warehouses for their products. These are known as bonded warehouses, and are in charge of bonded officers of the Government. All spirits produced from molasses or grain must, before shipment, be placed in warehouses for record, even though they be alcohol, cologne spirits, or other classes that do not require aging and are immediately marketable; all whiskies that require aging are allowed by the Government to remain in bonded warehouses for a maximum period of eight years and no tax is collected until the whiskies are withdrawn. For this reason the quantity of spirits withdrawn for consumption and export in any year may be much less

or much more than the quantity deposited or manufactured during the same period, and may include a fraction of the quantity manufactured within each of the preceding eight years. As no fixed law governs the length of time whiskies remain in bond, the amount of revenue annually collected bears no fixed relation to the quantity of whisky concurrently manufactured, and is, therefore, indeterminate as a factor of value.

The manufacturers of alcohol, cologne spirits, and such other classes as do not require aging, reported the value of their products to the Census Office as including the revenue tax, while among manufacturers of whisky there was no uniform practice in this respect. A trade custom has grown up under which distillers of whisky seldom pay excise tax to the Government. They receive orders from purchasers in advance of manufacture. The orders are booked, filled in turn, the spirits warehoused, and the purchaser furnished a warehouse receipt, on which he makes payment to the distiller exclusive of revenue. The purchaser pays the tax when he withdraws the whisky from bond. Some manufacturers of whisky, in reporting their operations to the Census Office, computed revenue on their entire output, while others excluded it altogether; still others reported only what they actually paid on their own withdrawals during the census year.

It is not possible, in consideration of the practices above described, to determine with exactness the amount of tax included in the $96,798,443 reported as the value of the 103,330,423 gallons of spirits produced in 1900, on which the revenue alone, if all computed, would amount to $113,663,465. The value of the 103,330,423 gallons would, if all were tax-paid, approximate $140,000,000. The records of the Bureau of Internal Revenue show that in 1890, 111,101,738 gallons of spirits were manufactured, and in 1900, 109,245,187 gallons. In 1890, $76,539,003 in taxes were collected on 85,043,336 gallons of spirits, and in 1900, $104,375,921 were collected on 94,887,201 gallons. Evidently, therefore, the $104,197,869 reported as the value of products in 1890 includes a much greater proportion of revenue than the $96,798,443 reported for value of products in 1900. The $73,218,227 reported for miscellaneous expenses at the census of 1900 includes only such revenue as is also included in the $96,798,443 reported as the value of products, and the two amounts are, therefore, in correct proportion.

Prior to 1870 the factor of internal-revenue tax is not included in value of products as shown in Table 10. Excise taxes have followed the three principal wars of the United States, viz., the Revolutionary War, the War of 1812, and the Civil War. The first law went into effect in 1791 and continued in operation until the accession of President Jefferson, on whose recommendation it was repealed. The second law was enacted in 1813, and repealed in 1817 on the recommendation of President Monroe. The present system of internal taxation was established in 1862 and, with modifications, has remained constantly in force. Since that date statistics of the production of distilled and malt liquors have been more complete and reliable than formerly. For the fiscal year 1870, 72,560,929 gallons of spirits were manufactured, and taxes were paid on 78,490,198 gallons, yielding $39,245,099 revenue. In 1880, 91,378,417 gallons were manufactured, and taxes were paid on 62,132,415 gallons, contributing $55,919,119 to the revenue of the Government. The amounts shown in Table 10, as the value of products for those years, are $36,191,133 and $41,063,663, respectively, or less in each case than the amount of the internal-revenue tax collected. Judging from the quantities of spirits manufactured in those years, the values reported can include only a small portion of the excise tax.

As an industry the manufacture of distilled spirits is subject to many vicissitudes and undergoes curious modifications. In the settlement of a new country it tends to diffuse among the people in the form of numerous small distilleries, increasing the number of establishments without a proportionate increase of capital or output. Such establishments produce whiskies and brandies. In older portions of the country, where trade customs are more permanently fixed, and supply and demand approach nearer to a mathematical certainty, the industry tends to centralize into large establishments.

This is shown by the fluctuations in number of establishments and by the varying relations between them and the average number of wage-earners. In 1850, 968 establishments employed 4,008 wage-earners, or 4.1 each; in 1860, the corresponding figures were 1,215 and 5,624, or 4.6 wage-earners to each establishment; in 1870, 719 and 5,131, or 7.1 each; in 1880, 844 and 6,502, or 7.7 each; in 1890, 440 and 4,762, or 10.8 each. In 1900 the number of establishments had increased to 967, but statistics of wage-earners for 1900 are not comparable with previous censuses, as explained elsewhere.

In spite of the fluctuations in numbers of establishments and of wage-earners from decade to decade, the reports at successive censuses show a continuous increase in capital. In 1870 this increase, concurrent with a decrease in number of establishments and wage-earners, was mostly due to the fact that values were reported in a depreciated currency, the average value of the dollar for that year being 79.81 cents gold.

It seems that the census of 1890 concerned itself only with the largest and most important establishments, and considered each combination of distilleries operated by the same corporation as one establishment. It appears, too, that the very small fruit and grain distilleries distributed in great number through the Southern states, especially Virginia and North Carolina, were much more thoroughly canvassed in 1900 than in 1890. These facts explain the disproportionate increase in number of establishments during the last decade, as shown by Table 10.

The report of the Commissioner of Internal Revenue for the fiscal year ending June 30, 1900—a month later than the census year—shows that a total of 3,614 distil-

leries were operated within that year. Of these, 10 were given over to the distillation of molasses, 1,304 to grain, and 2,300 to fruit.[1] At the census of 1900, 646 small distilleries, each with an output less than $500 in value, were reported and not included in the 967 establishments shown in Table 10. These small distilleries reported 47 wage-earners, $6,505 wages, $142,709 capital, and products valued at $108,048. The 2,001 establishments of this class from which reports were not received by the Census Office in 1900 are of little consequence, except to the student of purely local statistics. As a rule they are operated but a few days in the autumn of each year, and the same still may be made to do service on several farms in the same season. The output in each case usually consists of a small quantity of fruit brandy. The entire capital is but a few dollars, invested in a still set up by a spring of water, and no building or land values are involved.

Table 11 shows the four divisions of capital for the censuses of 1890 and 1900, with the percentages of increase or decrease for the decade between.

TABLE 11.—LIQUORS, DISTILLED: COMPARATIVE SUMMARY, CAPITAL, 1890 AND 1900.

	1900	1890	Per cent of increase.
Total	$32,551,604	$31,006,176	5.0
Land	2,524,480	2,816,967	[2] 10.4
Buildings	6,430,565	6,299,511	2.1
Machinery, tools, and implements	7,535,050	7,856,249	[2] 4.1
Cash and sundries	16,061,509	14,033,449	[2] 14.5

[1] Report Internal Revenue Commissioner, 1900, page 96.
[2] Decrease.

The total capital for 1900 shown by this table is identical with the item of capital in Table 10, and is repeated to show its divisions, which are: Land, $2,524,480; buildings, $6,430,565; machinery, tools, and implements, $7,535,050; and cash and sundries, $16,061,509. This last item includes cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries. On June 30, 1900, however, there were 136,071,880 gallons of manufactured spirits in bonded warehouses,[1] and it is evident that only a very small part of such quantity could have been reported as owned by distillers and included by them in the $16,061,509 reported for cash and sundries. From 1890 to 1900, an increase of 5 per cent is shown for total capital, 2.1 per cent for buildings, and 14.5 per cent for cash and sundries. A decrease of 10.4 per cent is shown for land, and 4.1 per cent for machinery, tools, and implements. This seeming inconsistency is due to the policy of large combinations of capital in localizing the manufacture of certain classes of distillates at points favoring least cost of production, and closing several large plants at other points. At the census of 1900, 110 idle establishments were reported, with a total capital of $3,633,910, which is not included in Table 11. At the active plants, buildings were improved on less expensive grounds, and machinery and equipment were brought nearer to the limit of their capacity.

Table 12 is a comparative summary of the industry, by states and territories, for 1890 and 1900.

[1] Report Internal Revenue Commissioner, 1900, page 149.

TABLE 12.—LIQUORS, DISTILLED: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
United States	1900	967	$32,551,604	661	$889,606	3,722	$1,783,218	$73,218,227	$15,147,784	$96,798,443
	1890	440	31,006,176	[1] 581	[1] 568,825	4,762	2,246,064	65,179,927	14,909,178	104,197,869
Alabama	1900	15	33,650	1	1,200	15	5,080	116,090	25,262	152,758
	1890									
Arkansas	1900	18	48,738	1	150	28	6,378	48,764	18,591	95,487
	1890	14	47,075	7	2,959	31	4,582	28,170	11,085	52,776
California	1900	8	76,600			20	5,932	5,675	191,364	238,267
	1890	8	106,053	3	2,448	42	12,464	122,834	58,498	229,701
Connecticut	1900	15	200,442	4	5,000	20	11,205	179,152	49,471	292,057
	1890	8	255,241	10	13,335	44	20,085	142,028	88,110	293,149
Delaware	1900	12	45,690	4	1,340	16	4,330	16,991	11,618	51,431
	1890									
Georgia	1900	28	54,808	4	1,320	42	8,557	135,152	39,695	198,891
	1890	37	83,625	15	5,318	104	26,476	158,397	69,034	323,938
Illinois	1900	20	3,164,811	58	104,518	338	191,995	33,391,799	3,784,652	38,208,076
	1890	7	8,782,041	24	55,280	999	769,860	31,505,991	3,918,106	51,996,737
Indiana	1900	24	1,325,900	38	62,922	236	112,049	14,340,455	1,929,865	16,961,058
	1890	17	1,626,825	28	22,704	167	61,109	4,721,785	711,111	5,840,129
Kentucky	1900	177	12,280,054	248	327,657	1,112	559,439	4,182,373	3,605,316	9,786,527
	1890	126	10,966,210	248	196,014	1,744	543,367	7,631,619	3,876,591	15,159,648
Maryland	1900	26	2,326,272	43	74,216	186	95,172	172,785	815,381	1,616,362
	1890	18	1,498,607	6	9,361	177	96,404	1,510,009	757,892	2,668,659
Massachusetts	1900	8	553,874	18	21,180	29	21,920	441,231	308,414	857,096
	1890	8	608,333	15	18,968	40	23,630	924,630	279,662	1,372,807

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 17.)

TABLE 12.—LIQUORS, DISTILLED: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1880 AND 1900—Cont'd.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
Missouri	1900	35	$147,895	8	$1,800	21	$5,473	$43,991	$24,898	$91,692
	1890	11	299,302	13	6,753	69	29,854	1,557,020	224,963	1,860,618
New Jersey	1900	31	304,934	3	7,320	71	30,278	633,516	126,707	884,802
	1890	4	14,700	3	640	5	1,087	3,535	3,697	10,599
New York	1900	16	394,906	19	24,468	62	26,621	909,958	141,626	1,201,851
	1890	6	195,793	8	4,473	48	22,073	261,257	118,750	422,824
North Carolina	1900	250	168,922	11	5,555	302	51,804	394,108	134,631	641,948
	1890	55	73,560	24	11,735	120	23,389	136,746	53,574	255,302
Ohio	1900	26	3,000,277	64	85,727	335	179,157	9,622,583	1,438,507	12,447,268
	1890	15	2,109,879	58	93,607	426	224,222	8,745,108	2,535,016	12,033,884
Oklahoma	1900	3	10,985	.....	.....	1	480	1,154	834	4,939
	1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania	1900	73	5,840,034	97	123,389	471	250,348	2,665,583	1,568,569	5,357,615
	1890	40	2,624,761	69	77,578	400	235,026	2,054,435	1,326,202	4,339,689
South Carolina	1900	22	20,893	1	500	31	4,792	54,121	31,285	105,788
	1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	1900	51	590,302	11	7,550	139	43,341	560,694	200,446	939,510
	1890	32	564,112	14	7,796	123	39,343	235,159	156,969	621,693
Texas	1900	5	24,426	.....	.....	6	1,955	10,814	4,446	20,657
	[1]1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Virginia	1900	91	270,943	7	2,594	66	15,021	147,304	56,520	257,885
	1890	28	99,887	13	3,872	50	7,155	47,852	19,450	93,132
West Virginia	1900	3	416,967	5	7,300	44	16,778	10,024	67,963	113,906
	[1]1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wisconsin	1900	5	773,890	11	11,000	53	29,979	2,280,404	342,296	2,698,984
	[1]1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other states	[2]1900	5	475,391	10	12,900	83	55,134	2,853,506	279,427	3,574,088
	[3]1890	11	1,050,192	23	35,989	178	105,938	5,398,352	705,463	6,622,594

[1] Included in "all other states."
[2] Includes establishments distributed as follows: Idaho, 1; Louisiana, 1; Nebraska, 2; New Hampshire, 1.
[3] Includes establishments distributed as follows: Minnesota, 2; Nebraska, 1; Texas, 2; Washington, 2; West Virginia, 2; Wisconsin, 2.

Of the 967 establishments reported at the census of 1900, 962 were returned from 23 states and 1 territory. The remaining 5 were distributed among 4 states. Twenty-seven states and 1 territory are, therefore, represented in the above table. The unusually thorough canvass of small distilleries for the census of 1900, and the lack of uniformity in including internal-revenue tax in reporting values, should be considered in making comparisons; these considerations will explain most of the seeming inconsistencies in Table 12. In some of the states, however, the decline shown is due to causes common to all classes of trade, and to changes in local liquor laws; in others it is due to the policy of corporations in closing establishments at certain points to concentrate manufacturing operations.

Illinois, with an output of 32,508,435 gallons of spirits, was the leading producer in 1900. Kentucky ranked second, with 21,709,873 gallons, and Indiana, Ohio, Pennsylvania, and Maryland followed in the order named with 17,494,779, 9,518,850, 7,189,655, and 3,812,856 gallons, respectively. In Illinois the industry is concentrated into a few large establishments, located principally in the city of Peoria, while in Kentucky it is well diffused. This in part explains the difference in capital reported from those two states. North Carolina, with the very small output of 599,540 gallons of spirits, was the leading state in number of establishments.

Table 13 shows the quantity and cost of materials and the quantity and value of products for the manufacture of distilled liquors in 1900.

TABLE 13.—LIQUORS, DISTILLED: MATERIALS AND PRODUCTS, 1900.

	Unit of measure.	Quantity.	Cost of materials used.	Value of products.
Materials:				
Total cost	.....	.....	$15,147,784	.....
Corn	Bushels	16,555,804	5,968,198	.....
Rye	Bushels	3,952,333	2,482,524	.....
Wheat	Bushels	17,419	10,340	.....
Barley	Bushels	109,115	57,421	.....
Malt	Bushels	3,623,829	1,956,984	.....
Fruits	.....	.....	256,551	.....
Wine	Gallons	1,339,606	57,047	.....
Molasses	Gallons	2,962,691	282,011	.....
Fuel, and rent of power and heat	.....	.....	896,631	.....
Mill supplies	.....	.....	74,976	.....
All other materials	.....	.....	2,976,182	.....
Freight	.....	.....	128,969	.....
Products:				
Total value	.....	.....	.....	$96,798,443
Alcohol and cologne spirits	Proof gallons	54,304,925	.....	62,617,892
Whisky	Proof gallons	45,488,592	.....	28,729,027
Brandy	Proof gallons	908,051	.....	758,231
Gin	Proof gallons	1,087,149	.....	1,425,717
Rum	Proof gallons	1,546,706	.....	1,033,117
Wine	Gallons	120,630	.....	25,689
All other products	.....	.....	.....	2,208,770

According to this table, the total quantity of all classes of distilled spirits reported at the census of 1900 was 103,330,423 gallons, which does not include the output of 2 large establishments in the state of New York (closed when the canvass was made); 102,028 gallons reported from 646 establishments, each with an output less than $500 in value; brandy used in the for-

tification of wines; and the output of about 2,000 small fruit distilleries from which reports were not sought. The combined quantity used for fortification and that not reported from New York approximates 4,000,000 gallons, making a total of more than 107,000,000 gallons identified by the Census Office. The comparatively small difference between this quantity and the 109,245,187 gallons reported to the Internal Revenue Bureau for the fiscal year ending June 30, 1900, is due to the different periods covered by the reports of the two bureaus and to the product of the 2,000 small establishments not canvassed by the Census Office.

Table 13 shows that a total of 24,258,500 bushels of grain, 1,339,606 gallons of wine, 2,962,691 gallons of molasses, and fruit (quantity not ascertained) costing $256,551, were used in manufacturing 103,330,423 gallons of spirits. It is not possible to reduce these quantities to correct equivalents, because of the lack of uniformity in the use of particular materials for particular products. Generally speaking, grain is used in the manufacture of gin, whisky, alcohol, and cologne spirits; fruit and wine in the manufacture of brandy; and molasses in the distillation of rum. According to this practice, 24,258,500 bushels of grain were used in the distillation of 100,875,666 gallons of gin, whisky, alcohol, and cologne spirits, or an average of 4.16 gallons of spirits for each bushel of grain. Wheat is little used because of its greater cost, and corn is largely used because of its cheapness. Of the total quantity of grain consumed, 68.2 per cent was corn. It is made into corn whisky, Bourbon whisky, alcohol, and neutral or cologne spirits. The 1,546,706 gallons of rum reported do not represent the quantity distilled from 2,962,691 gallons of molasses, as a part of the molasses reported was manufactured into pure spirits.

The determination to make, for the first time, the manufacture of alcoholic liquors the subject of special inquiry, was reached too late in the organization of the Census Office work to permit the drafting of special schedules designed to secure accurate data pertaining to the different classes of liquors. The reports of the several establishments were made on the general schedule for manufactures. The inquiries sought to elicit accurate statistics of the total quantity of spirits manufactured, but the importance of the several classes could not be emphasized. No great accuracy, therefore, is claimed for the classification of products as shown in Table 13. It is possible that the 54,304,925 gallons reported as alcohol and cologne spirits, and the 45,483,592 reported as whisky, both include some spirits that should receive a more definite classification. The distillation of alcohol and pure, neutral, or cologne spirits is largely confined to the states of Illinois and Indiana; that of Bourbon whisky to Kentucky; and that of rye whisky to Pennsylvania and Maryland.

Table 14 shows the quantity of distilled spirits manufactured and also the quantity on which revenue tax was paid, by fiscal years, from 1863 to 1900, inclusive.[1]

[1] Report of Commissioner of Internal Revenue, 1900, pages 440 and 441.

TABLE 14.—QUANTITY OF DISTILLED SPIRITS MANUFACTURED AND QUANTITY ON WHICH TAX WAS PAID, BY FISCAL YEARS, FROM 1863 TO 1900, INCLUSIVE.

YEAR.	Number of gallons manufactured.	Number of gallons on which tax was paid.	YEAR.	Number of gallons manufactured.	Number of gallons on which tax was paid.
1863	16,149,954	16,149,954	1882	107,283,215	71,976,398
1864	85,295,393	85,295,393	1883	75,294,510	76,762,063
1865	16,973,974	16,973,974	1884	76,531,167	79,616,901
1866	24,062,705	14,847,943	1885	76,405,074	69,158,025
1867	32,740,236	14,588,740	1886	81,849,260	70,851,355
1868	16,910,913	7,224,809	1887	79,433,446	67,380,391
1869	54,276,742	62,092,417	1888	71,688,188	71,565,486
1870	72,560,929	78,490,198	1889	91,133,550	77,163,529
1871	57,048,457	62,314,628	1890	111,101,738	85,043,336
1872	69,365,443	66,235,578	1891	117,767,101	88,473,437
1873	71,202,554	65,911,141	1892	118,436,506	95,045,787
1874	69,572,061	62,581,562	1893	131,010,330	99,145,889
1875	62,687,627	64,425,911	1894	92,153,651	88,777,387
1876	58,631,868	58,012,693	1895	81,909,771	75,555,742
1877	61,439,409	58,543,389	1896	89,992,555	68,480,720
1878	57,342,456	50,704,189	1897	64,279,075	69,979,362
1879	72,888,373	53,025,175	1898	83,668,411	79,764,749
1880	91,378,417	62,132,415	1899	100,162,334	85,125,532
1881	119,528,011	69,127,206	1900	109,245,187	94,887,201

An examination of this table shows that for a series of years the quantity of spirits manufactured fluctuates considerably more than the quantity withdrawn from bond, or tax paid. In 1881, 119,528,011 gallons, and in 1882, 107,283,215 gallons were distilled; in 1883 the quantity was but 75,294,510 gallons. The largest quantity manufactured in any year was 131,010,330 gallons, in 1893. In the succeeding year, 1894, only 92,153,651 gallons were produced. The quantities withdrawn and tax paid for the same years show more uniformity, and are more nearly representative of the annual consumption.

During the fiscal year ending June 30, 1900, internal-revenue tax was paid on 94,887,201 proof gallons of spirits, presumably withdrawn for consumption. In the same period 2,482,020 gallons were imported, of which 46,767 gallons were exported, leaving 2,435,253 gallons as the net imports for domestic consumption. This is an excess of 551,648 gallons over domestic exports, which amounted to 1,883,605 gallons.

A large quantity of distilled spirits is annually consumed in the arts and sciences, and in compounds and manufactures of medicines. At the census of 1890 this was reported as 10,976,842 gallons. At the census of 1900 no special inquiry was made as to the quantity so used, but it may safely be estimated to have exceeded the quantity consumed in 1890.

The output of illicit distilleries is large, but of course can not be estimated. The increase in volume of spirits passing through rectifying houses should also be considered in computing per capita consumption. With these various items taken into account it appears that the quantity consumed as a beverage by the people of the United States during 1900 could not have been far from 91,000,000 gallons, or a per capita consumption of approximately 1.2 gallons. Most of the distilled liquors consumed as a beverage by the American people pass through rectifying houses. The different classes of rectified spirits range from the cheapest concoctions of neutral spirits and drugs to the simple

blending of young and old whiskies. The number of gallons rectified in the United States during 1900 was 74,508,420.

Table 15 shows the quantity, value, and destination of distilled liquors exported from the United States during the fiscal year ending June 30, 1900.

TABLE 15.—EXPORTS OF LIQUORS, DISTILLED, BY COUNTRIES, 1900.[1]

COUNTRIES TO WHICH EXPORTED.	TOTAL.		ALCOHOL, INCLUDING PURE, NEUTRAL, OR COLOGNE SPIRITS.		BRANDY.		RUM.		WHISKY.			
									Bourbon.		Rye.	
	Gallons.	Value.	Proof gallons.	Value.	Proof gallons.	Value.	Proof gallons.	Value.	Proof gallons.	Value.	Proof gallons.	Value.
Total	1,883,605	$1,932,884	177,974	$59,277	80,259	$83,698	670,410	$903,808	863,241	$764,860	91,721	$121,241
EUROPE.												
Total	661,692	545,377	5	10	48,514	27,938	31,083	43,372	555,671	442,425	26,419	31,632
Austria-Hungary	75	261									75	261
Azores and Madeira Islands	71	99									71	99
Belgium	53	167									53	167
Denmark	305	502			97	85			2	5	206	412
France	3,796	7,495			42	129	864	1,800	875	679	2,015	4,887
Germany	574,218	460,735			353	265	63	49	554,661	441,592	19,141	18,829
Greenland, Iceland, etc	7	25	5	10	2	15						
Italy	125	299			36	79			30	20	59	200
Malta, Gozo, etc	170	305									170	305
Netherlands	19	84									19	84
Russia—Baltic and White seas	6	10									6	10
Sweden and Norway	290	424							103	129	187	295
Turkey in Europe	21,020	28,810					21,017	28,807			3	3
United Kingdom	61,587	46,161			47,984	27,365	9,139	12,716			4,414	6,080
NORTH AMERICA.												
Total	202,340	195,759	67,459	24,789	11,534	24,171	2,623	3,778	67,367	71,750	53,357	71,276
Bermuda	43,021	50,942	4,285	4,161	4,512	11,938			7,110	6,890	27,114	27,958
British Honduras	8,947	5,799	1,830	604					6,587	4,320	530	875
Dominion of Canada:												
Nova Scotia, New Brunswick, etc	1,771	2,702			1	4			1,202	2,024	568	674
Quebec, Ontario, Manitoba, etc	3,008	3,200	1,472	520	59	93	429	613	113	236	935	1,738
British Columbia	1,774	3,981	5	20	659	1,237			1,108	2,717	2	7
Central American states:												
Costa Rica	43,623	22,066	32,075	9,622					8,772	7,940	2,776	4,504
Guatemala	7,884	14,199	20	5	133	157			7,444	13,489	287	548
Honduras	4,768	7,927	350	111	297	441			1,690	2,787	2,431	4,588
Nicaragua	37,564	22,747	13,847	4,275	344	344			19,069	12,646	4,304	5,482
Salvador	760	1,714			36	60			724	1,054		
Mexico	24,884	25,283	12,445	4,412	5,267	9,452			4,794	7,890	2,328	3,529
Miquelon	2,203	3,197					2,194	3,160			9	37
West Indies:												
British	1,182	2,141							356	273	826	1,868
Cuba	13,710	19,169			30	30			5,534	6,269	8,146	12,870
Danish	280	284	172	34							108	250
Dutch	724	1,850									724	1,850
Haiti	971	1,155	932	1,012							39	143
Porto Rico	5,290	7,390			196	415			2,864	2,615	2,280	4,360
Santo Domingo	26	13	26	13								
SOUTH AMERICA.												
Total	8,625	11,962	3,155	1,274	201	406			1,826	3,344	3,443	6,938
Argentina	465	908							115	75	350	833
Brazil	463	946			42	110			144	72	277	764
Chile	1,204	1,897							542	955	662	942
Colombia	4,962	4,810	3,155	1,274	50	25			480	1,141	1,277	2,370
Ecuador	757	1,807			109	271			420	1,010	228	526
Guianas:												
British	51	16							51	16		
Dutch	161	269									161	269
Peru	250	709									250	709
Uruguay	146	181							74	75	72	106
Venezuela	166	419									166	419
ASIA.												
Total	263,490	118,393	104,936	32,374	1,216	2,093	702	1,190	155,656	80,751	980	1,985
Chinese Empire	10,112	11,338	5,301	1,608	100	125	656	1,160	3,586	7,372	469	1,073
East Indies:												
British	823	1,618			13	33			405	920	405	665
Dutch	15	25									15	25
Hongkong	11,179	14,152	3,000	1,060	150	250			8,029	12,902		
Japan	241,336	91,209	96,635	29,766	953	1,685	46	30	143,611	59,506	91	222
Korea	25	51							25	51		
OCEANIA.												
Total	111,354	205,724	2,419	880	18,794	29,090			82,721	166,590	7,420	9,214
British Australasia	3,934	6,462	50	45	9	24			2,106	4,389	1,769	2,004
Guam	15	42							15	42		
Hawaii	25,083	45,016	1,655	679	722	1,006			22,426	42,831	280	500
Philippine Islands	82,204	153,955	714	106	18,063	28,060			58,056	119,079	5,371	6,710
Tonga, Samoa, etc	118	249							118	249		
AFRICA.												
Total	636,104	855,669					636,002	855,473			102	196
British Africa	635,841	855,281					635,764	855,140			77	141
French Africa	238	333					238	333				
Portuguese Africa	25	55									25	55

[1] Commerce and Navigation of the United States: United States Treasury Department, 1900.

Table 16 presents detailed statistics of the manufacture of distilled liquors, by states and territories, for 1900.

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900.

	United States.	Alabama.	Arkansas.	California.	Connecticut.	Delaware.	Georgia.	Illinois.
Number of establishments	967	15	18	8	15	12	28	20
Character of organization:								
Individual	727	10	12	5	12	12	22	6
Firm and limited partnership	138	4	6	3	2	.....	4	1
Incorporated company	102	1	.....	.....	1	.....	2	13
Capital:								
Total	$32,551,604	$33,650	$48,738	$76,600	$200,442	$45,690	$54,808	$3,164,811
Land	$2,524,480	$3,970	$1,370	$2,100	$12,295	$2,525	$3,485	$192,936
Buildings	$6,430,565	$6,425	$8,500	$15,200	$44,450	$7,575	$10,350	$555,573
Machinery, tools, and implements	$7,535,050	$20,475	$12,225	$17,850	$44,425	$8,805	$17,000	$1,733,352
Cash and sundries	$16,061,509	$2,780	$26,643	$41,450	$99,272	$26,785	$23,973	$682,950
Proprietors and firm members	1,009	16	23	9	16	12	29	6
Salaried officials, clerks, etc.:								
Total number	661	1	1	.....	4	4	4	58
Total salaries	$889,606	$1,200	$150	.....	$5,000	$1,340	$1,320	$104,518
Officers of corporations—								
Number	99	.....	.....	.....	.....	.....	1	13
Salaries	$286,036	.....	.....	.....	.....	.....	$600	$47,836
General superintendents, managers, clerks, etc.—								
Total number	562	1	1	.....	4	4	3	45
Total salaries	$603,570	$1,200	$150	.....	$5,000	$1,340	$720	$56,682
Men—								
Number	542	1	1	.....	4	4	3	43
Salaries	$593,539	$1,200	$150	.....	$5,000	$1,340	$720	$55,643
Women—								
Number	20	.....	.....	.....	.....	.....	.....	2
Salaries	$10,031	.....	.....	.....	.....	.....	.....	$1,039
Wage-earners, including piece workers, and total wages:								
Greatest number employed at any one time during the year	6,767	32	55	30	43	53	55	543
Least number employed at any one time during the year	3,509	23	35	19	27	30	53	269
Average number	3,722	15	28	20	20	16	42	338
Wages	$1,733,218	$5,080	$6,378	$5,932	$11,205	$4,330	$8,557	$191,995
Men, 16 years and over—								
Average number	3,623	15	23	20	20	16	42	337
Wages	$1,715,552	$5,080	$6,378	$5,932	$11,205	$4,330	$8,557	$191,780
Women, 16 years and over—								
Average number	81	.....	.....	.....	.....	.....	.....	1
Wages	$15,428	.....	.....	.....	.....	.....	.....	$215

	Indiana.	Kentucky.	Maryland.	Massachusetts.	Missouri.	New Jersey.	New York.	North Carolina.	Ohio.
Number of establishments	24	177	26	8	35	31	16	250	26
Character of organization:									
Individual	13	87	12	5	28	27	10	241	16
Firm and limited partnership	6	44	4	2	5	2	5	8	5
Incorporated company	5	46	10	1	2	2	1	1	5
Capital:									
Total	$1,325,900	$12,280,054	$2,326,272	$553,874	$147,895	$304,934	$394,906	$168,922	$3,000,277
Land	$74,630	$1,204,073	$185,035	$72,575	$4,695	$8,010	$24,740	$8,575	$136,000
Buildings	$365,615	$2,250,022	$690,024	$120,000	$21,225	$50,775	$76,200	$27,170	$438,610
Machinery, tools, and implements	$444,605	$3,065,812	$315,310	$78,500	$26,972	$42,125	$82,731	$61,379	$305,275
Cash and sundries	$441,050	$5,760,147	$1,135,903	$282,799	$95,003	$204,024	$211,235	$71,798	$2,120,392
Proprietors and firm members	26	188	19	6	39	33	20	253	29
Salaried officials, clerks, etc.:									
Total number	38	248	43	18	3	3	19	11	64
Total salaries	$62,922	$327,657	$74,216	$21,180	$1,800	$7,320	$24,468	$5,555	$85,727
Officers of corporations—									
Number	2	45	10	.....	2	.....	1	2	9
Salaries	$13,296	$146,000	$43,200	.....	$1,200	.....	$1,000	$2,000	$14,904
General superintendents, managers, clerks, etc.—									
Total number	36	203	33	18	1	3	18	9	55
Total salaries	$49,626	$181,657	$31,016	$21,180	$600	$7,320	$23,468	$3,555	$70,823
Men—									
Number	36	197	33	17	1	3	18	9	47
Salaries	$49,626	$178,985	$31,016	$20,680	$600	$7,320	$23,468	$3,555	$66,323
Women—									
Number	.....	6	.....	1	.....	.....	.....	.....	8
Salaries	.....	$2,672	.....	$500	.....	.....	.....	.....	$4,500
Wage-earners, including pieceworkers, and total wages:									
Greatest number employed at any one time during the year	313	2,800	265	35	64	157	108	478	448
Least number employed at any one time during the year	235	919	197	32	46	112	74	399	271
Average number	236	1,112	186	29	21	71	62	302	335
Wages	$112,049	$559,439	$95,172	$21,920	$5,473	$30,278	$26,621	$51,804	$179,157
Men, 16 years and over—									
Average number	236	1,079	181	29	21	70	61	302	317
Wages	$112,049	$554,819	$94,212	$21,920	$5,473	$30,086	$26,361	$51,804	$174,798
Women, 16 years and over—									
Average number	.....	29	.....	.....	.....	1	1	.....	12
Wages	.....	$4,628	.....	.....	.....	$192	$260	.....	$8,868

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900—Continued.

	Oklahoma.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Number of establishments	3	73	22	51	5	91	3	5	5
Character of organization:									
Individual	2	49	22	40	5	86	2	2	1
Firm and limited partnership	1	21	.....	9	.....	4	.....	.....	2
Incorporated company	.....	3	.....	2	.....	1	1	3	2
Capital:									
Total	$10,985	$5,840,034	$20,898	$590,302	$24,426	$270,943	$416,967	$773,890	$475,891
Land	$175	$887,340	$503	$20,027	$3,125	$8,390	$30,020	$64,534	$73,352
Buildings	$1,700	$1,322,203	$2,355	$64,677	$3,050	$34,140	$150,400	$102,326	$62,000
Machinery, tools, and implements	$2,300	$598,454	$13,250	$81,985	$5,400	$61,892	$98,247	$215,280	$181,401
Cash and sundries	$6,810	$3,032,037	$4,785	$423,613	$12,851	$166,521	$138,300	$391,750	$158,638
Proprietors and firm members	2	99	22	55	5	93	2	2	5
Salaried officials, clerks, etc.:									
Total number	.....	97	1	11	.....	7	5	11	10
Total salaries	.....	$123,889	$500	$7,550	.....	$2,594	$7,300	$11,000	$12,900
Officers of corporations—									
Number	.....	3	.....	3	.....	.....	2	5	1
Salaries	.....	$4,700	.....	$2,100	.....	.....	$3,500	$4,200	$1,500
General superintendents, managers, clerks, etc.—									
Total number	.....	94	1	8	.....	7	3	6	9
Total salaries	.....	$118,689	$500	$5,450	.....	$2,594	$3,800	$6,800	$11,400
Men—									
Number	.....	91	1	8	.....	7	3	6	9
Salaries	.....	$117,369	$500	$5,450	.....	$2,594	$3,800	$6,800	$11,400
Women—									
Number	.....	3	.....	.....	.....	.....	.....	.....	.....
Salaries	.....	$1,320	.....	.....	.....	.....	.....	.....	.....
Wage-earners, including pieceworkers, and total wages:									
Greatest number employed at any one time during the year	5	678	48	192	13	143	48	62	99
Least number employed at any one time during the year	4	328	37	152	11	113	32	46	45
Average number	1	471	31	139	6	66	44	53	83
Wages	$480	$250,348	$4,792	$43,341	$1,955	$15,021	$16,778	$29,979	$55,134
Men, 16 years and over—									
Average number	1	431	31	139	6	66	44	53	83
Wages	$480	$243,788	$4,792	$43,341	$1,955	$15,021	$16,778	$29,979	$55,134
Women, 16 years and over—									
Average number	.....	37	.....	.....	.....	.....	.....	.....	.....
Wages	.....	$6,265	.....	.....	.....	.....	.....	.....	.....

	United States.	Alabama.	Arkansas.	California.	Connecticut.	Delaware.	Georgia.	Illinois.
Wage-earners, including pieceworkers, and total wages—Continued.								
Children under 16 years—								
Average number	18	.....	.....	.....	.....	.....	.....	.....
Wages	$2,238	.....	.....	.....	.....	.....	.....	.....
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	3,949	7	21	20	15	4	40	350
February	4,122	12	16	20	14	5	41	314
March	4,747	14	26	22	15	5	44	334
April	4,812	18	20	16	16	9	48	385
May	4,554	18	33	14	17	12	49	356
June	2,897	10	25	16	17	8	41	264
July	2,285	15	17	13	15	15	34	259
August	2,374	18	25	19	15	35	34	277
September	2,807	20	25	21	28	44	38	304
October	3,339	20	24	27	40	27	41	324
November	3,784	20	23	28	33	17	44	436
December	3,811	13	22	26	20	8	44	440
Women, 16 years and over—								
January	80	.....	.....	.....	.....	.....	.....	2
February	84	.....	.....	.....	.....	.....	.....	2
March	90	.....	.....	.....	.....	.....	.....	2
April	96	.....	.....	.....	.....	.....	.....	5
May	91	.....	.....	.....	.....	.....	.....	2
June	78	.....	.....	.....	.....	.....	.....	.....
July	76	.....	.....	.....	.....	.....	.....	.....
August	75	.....	.....	.....	.....	.....	.....	.....
September	70	.....	.....	.....	.....	.....	.....	.....
October	74	.....	.....	.....	.....	.....	.....	.....
November	76	.....	.....	.....	.....	.....	.....	.....
December	83	.....	.....	.....	.....	.....	.....	2
Children, under 16 years—								
January	17	.....	.....	.....	.....	.....	.....	.....
February	18	.....	.....	.....	.....	.....	.....	.....
March	18	.....	.....	.....	.....	.....	.....	.....
April	18	.....	.....	.....	.....	.....	.....	.....
May	18	.....	.....	.....	.....	.....	.....	.....
June	20	.....	.....	.....	.....	.....	.....	.....
July	18	.....	.....	.....	.....	.....	.....	.....
August	18	.....	.....	.....	.....	.....	.....	.....
September	18	.....	.....	.....	.....	.....	.....	.....
October	18	.....	.....	.....	.....	.....	.....	.....
November	18	.....	.....	.....	.....	.....	.....	.....
December	16	.....	.....	.....	.....	.....	.....	.....

[1] Includes establishments distributed as follows: Idaho, 1; Louisiana, 1; Nebraska, 2; New Hampshire 1.

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900—Continued.

	Indiana.	Kentucky.	Maryland.	Massachusetts.	Missouri.	New Jersey.	New York.	North Carolina.	Ohio.
Wage-earners, including pieceworkers, and total wages—Continued.									
Children, under 16 years—									
Average number		4	5						6
Wages		$492	$960						$491
Average number of wage-earners, including pieceworkers, employed during each month:									
Men, 16 years and over—									
January	232	1,258	231	30	27	38	48	371	338
February	236	1,498	222	30	24	38	48	355	339
March	240	2,052	227	30	39	38	48	353	342
April	230	2,119	224	27	41	38	48	330	332
May	227	1,968	218	32	35	40	47	321	321
June	226	662	129	32	15	38	42	265	357
July	219	344	75	27	4	38	40	230	269
August	218	342	95	27	5	89	49	230	255
September	223	361	120	27	7	147	94	254	270
October	288	506	186	30	17	155	100	286	320
November	254	858	211	30	19	116	97	300	319
December	242	983	231	30	18	70	65	323	346
Women, 16 years and over—									
January		30				1	1		10
February		30				1	1		13
March		33				1	1		15
April		33				1	1		16
May		33				1	1		14
June		32				1	1		11
July		26				1	1		12
August		26				1	1		11
September		26				1	1		10
October		26				1	2		8
November		26				1	2		10
December		26				1	2		10
Children, under 16 years—									
January		4	5						5
February		4	5						6
March		4	5						6
April		4	5						6
May		4	5						6
June		4	5						8
July		4	5						6
August		4	5						6
September		4	5						6
October		4	5						6
November		4	5						6
December		4	5						4

	Oklahoma.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Wage-earners, including pieceworkers, and total wages—Continued.									
Children, under 16 years—									
Average number		3							
Wages		$295							
Average number of wage-earners, including pieceworkers, employed during each month:									
Men, 16 years and over—									
January	1	495	82	130	11	51	48	58	93
February	1	490	33	127	11	51	48	56	93
March		487	37	132	8	56	48	57	93
April	3	471	89	128	7	65	48	57	93
May	3	411	35	128	2	67	48	55	97
June		406	33	125	2	51	32	54	47
July	1	312	27	140		59	32	50	50
August	1	271	21	146		70	32	49	51
September	1	360	19	161		92	48	45	98
October		476	32	157	6	88	48	49	97
November	1	509	33	154	13	74	48	51	96
December		489	31	137	11	67	47	54	94
Women, 16 years and over—									
January		36							
February		37							
March		38							
April		40							
May		40							
June		33							
July		36							
August		36							
September		32							
October		37							
November		37							
December		42							
Children, under 16 years—									
January		3							
February		3							
March		3							
April		3							
May		3							
June		3							
July		3							
August		3							
September		3							
October		3							
November		3							
December		3							

[1] Includes establishments distributed as follows: Idaho, 1; Louisiana, 1; Nebraska, 2; New Hampshire, 1.

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900—Continued.

	United States.	Alabama.	Arkansas.	California.	Connecticut.	Delaware.	Georgia.	Illinois.
Miscellaneous expenses:								
Total	$73,218,227	$116,090	$48,764	$5,675	$179,152	$16,991	$135,152	$33,391,799
Rent of works	$103,928	$40	.....	$100	.....	$137	$296	$32,170
Taxes, not including internal revenue	$202,762	$107	$309	$417	$862	$372	$1,158	$13,255
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$72,886,752	$115,783	$48,455	$5,083	$178,290	$16,482	$133,698	$33,346,374
Contract work	$24,785	$160	.....	$75	.....	.....	.....	.....
Materials used:								
Total cost	$15,147,784	$25,262	$18,591	$191,864	$49,471	$11,618	$39,695	$3,734,652
Corn, bushels	16,555,804	34,498	14,925	.....	16,700	1,333	58,730	5,983,014
Cost	$5,968,198	$17,225	$5,613	.....	$8,036	$600	$29,883	$1,981,179
Rye, bushels	3,952,333	691	288	.....	15,900	1,250	80	192,554
Cost	$2,482,524	$458	$194	.....	$11,073	$800	$15	$115,405
Wheat, bushels	17,419	.....	50	.....	.....	.....	.....	.....
Cost	$10,340	.....	$30	.....	.....	.....	.....	.....
Barley, bushels	109,115	163	145	.....	9,600	.....	175	.....
Cost	$57,421	$98	$93	.....	$6,240	.....	$99	.....
Malt, bushels	3,623,829	1,053	175	.....	1,300	1,500	2,568	1,252,709
Cost	$1,956,934	$742	$100	.....	$900	$900	$2,526	$804,875
Fruits	$256,551	$860	$7,765	$119,840	$6,842	$5,851	.....	$2,200
Wine, gallons	1,339,606	.....	.....	1,339,606	.....	.....	.....	.....
Cost	$57,047	.....	.....	$57,047	.....	.....	.....	.....
Molasses, gallons	2,962,691	.....	.....	.....	.....	.....	.....	.....
Cost	$282,011	.....	.....	.....	.....	.....	.....	.....
Fuel	$894,142	$2,400	$2,095	$2,859	$7,368	$1,357	$4,453	$208,851
Rent of power and heat	$2,489	.....	.....	.....	$35	.....	.....	.....
Mill supplies	$74,976	$225	$100	$15	$449	$35	$60	$16,778
All other materials	$2,976,182	$294	$2,507	$11,558	$6,668	$2,070	$2,361	$805,834
Freight	$128,969	$2,960	$94	$45	$1,760	$505	$298	$30
Products:								
Total value	$96,798,443	$152,758	$95,487	$238,267	$292,057	$51,431	$198,891	$38,208,076
Alcohol and cologne spirits, proof gallons	54,304,925	.....	17,000	.....	.....	.....	.....	31,843,146
Value	$62,617,892	.....	$18,000	.....	.....	.....	.....	$36,893,146
Whisky, proof gallons	45,483,592	113,434	31,984	.....	.....	14,000	178,580	301,121
Value	$28,729,027	$148,443	$34,301	.....	.....	$29,100	$197,137	$418,170
Brandy, proof gallons	908,051	1,900	25,549	551,116	15,499	7,645	.....	6,147
Value	$753,231	$4,115	$43,186	$210,772	$29,687	$18,692	.....	$6,767
Gin, proof gallons	1,087,149	.....	.....	.....	142,000	.....	.....	358,021
Value	$1,425,717	.....	.....	.....	$258,000	.....	.....	$501,229
Rum, proof gallons	1,546,706	.....	.....	.....	.....	.....	.....	.....
Value	$1,033,117	.....	.....	.....	.....	.....	.....	.....
Wine, gallons	120,630	.....	.....	116,050	.....	2,960	.....	620
Value	$25,689	.....	.....	$22,495	.....	$2,364	.....	$80
All other products	$2,208,770	$200	.....	$5,000	$4,370	$1,275	$1,754	$388,684

	Indiana.	Kentucky.	Maryland.	Massachusetts.	Missouri.	New Jersey.	New York.	North Carolina.	Ohio.
Miscellaneous expenses:									
Total	$14,340,455	$4,182,378	$172,785	$441,231	$43,991	$633,516	$909,958	$394,108	$9,622,583
Rent of works	.....	$10,231	$3,779	$3,000	$25	$9,180	$6,725	$852	$5
Taxes, not including internal revenue	$9,427	$67,205	$28,607	$6,058	$331	$1,727	$1,567	$1,017	$15,550
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$14,317,353	$4,094,989	$140,399	$432,173	$43,575	$622,409	$901,666	$392,033	$9,607,028
Contract work	$13,675	$9,948	.....	.....	$60	$200	.....	$206	.....
Materials used:									
Total cost	$1,929,865	$3,605,316	$815,381	$308,414	$24,898	$126,707	$141,626	$134,631	$1,438,507
Corn, bushels	3,397,188	3,619,023	222,824	800	34,220	45,375	116,920	162,285	1,727,552
Cost	$1,161,569	$1,470,554	$99,130	$400	$14,348	$18,150	$47,640	$84,942	$619,528
Rye, bushels	101,442	955,107	695,598	900	2,981	45,375	80,446	14,894	340,279
Cost	$58,972	$598,595	$456,877	$540	$1,703	$23,595	$15,583	$10,645	$202,197
Wheat, bushels	.....	53	500	.....	400	.....	.....	606	3,607
Cost	.....	$35	$325	.....	$230	.....	.....	$445	$2,614
Barley, bushels	.....	355	6,500	150	60	.....	.....	634	89,315
Cost	.....	$252	$3,900	$82	$42	.....	.....	$377	$45,176
Malt, bushels	524,664	756,699	106,607	.....	996	30,250	28,950	12,889	206,910
Cost	$290,121	$443,827	$69,597	.....	$683	$18,150	$17,370	$9,119	$159,446
Fruits	$12,552	$10,049	$3,554	$264	$670	$39,299	$22,529	$1,386	$6,803
Wine, gallons	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cost	.....	.....	.....	.....	.....	.....	.....	.....	.....
Molasses, gallons	.....	200,000	.....	1,843,865	.....	.....	.....	.....	.....
Cost	.....	$10,000	.....	$235,493	.....	.....	.....	.....	.....
Fuel	$102,507	$205,148	$50,956	$15,485	$3,473	$12,500	$12,321	$21,428	$75,541
Rent of power and heat	.....	$288	.....	.....	.....	.....	.....	.....	$2,000
Mill supplies	$9,387	$17,768	$1,851	$522	$211	$850	$1,588	$433	$9,374
All other materials	$294,637	$782,146	$123,458	$87,693	$2,907	$14,018	$24,305	$2,821	$311,417
Freight	$120	$66,704	$5,733	$17,985	$631	$145	$290	$3,035	$4,411
Products:									
Total value	$16,961,058	$9,786,527	$1,616,362	$857,096	$91,692	$884,802	$1,201,851	$641,948	$12,447,268
Alcohol and cologne spirits, proof gallons	14,677,101	.....	.....	.....	.....	.....	590,841	.....	3,276,790
Value	$16,020,740	.....	.....	.....	.....	.....	$749,293	.....	$4,022,649
Whisky, proof gallons	2,698,324	21,511,608	3,791,603	.....	138,281	465,000	79,715	595,338	5,818,810
Value	$775,874	$9,404,981	$1,554,157	.....	$89,140	$651,000	$117,601	$625,654	$6,768,081
Brandy, proof gallons	84,875	28,265	15,253	276	1,375	104,389	52,655	3,696	16,673
Value	$36,944	$39,992	$27,609	$548	$2,010	$174,332	$74,099	$5,546	$19,276
Gin, proof gallons	84,476	.....	6,000	6,187	.....	.....	76,309	506	406,577
Value	$23,225	.....	$1,350	$1,856	.....	.....	$106,832	$1,320	$522,640
Rum, proof gallons	.....	170,000	.....	1,354,206	.....	.....	.....	.....	.....
Value	.....	$147,500	.....	$852,992	.....	.....	.....	.....	.....
Wine, gallons	.....	.....	.....	.....	.....	.....	.....	.....	.....
Value	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other products	$104,275	$194,054	$33,246	$1,700	$542	$59,470	$154,026	$9,428	$1,114,628

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900—Continued.

	Oklahoma.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Miscellaneous expenses:									
Total	$1,154	$2,665,583	$54,121	$560,694	$10,814	$147,304	$10,024	$2,280,404	$2,853,506
Rent of works		$36,420	$16	$631		$321			
Taxes, not including internal revenue	$18	$39,658	$97	$4,120	$71	$1,588	$1,418	$1,800	$6,023
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$1,136	$2,589,108	$54,008	$555,879	$10,743	$145,395	$8,606	$2,278,604	$2,847,483
Contract work		$397		$64					
Materials used:									
Total cost	$834	$1,568,569	$31,285	$200,446	$4,446	$56,520	$67,963	$342,296	$279,427
Corn, bushels	1,583	100,787	34,529	241,677	7,384	37,629	2,326	319,088	375,464
Cost	$383	$42,276	$19,410	$110,392	$2,039	$18,153	$999	$105,576	$109,578
Rye, bushels	14	1,341,496	4,601	20,022	403	18,454	52,996	100,677	15,935
Cost	$8	$855,548	$4,232	$12,137	$333	$11,828	$37,065	$56,503	$8,218
Wheat, bushels	18	6,393				328		1,464	4,000
Cost	$14	$4,259				$207		$581	$1,600
Barley, bushels			200	1,593	100	125			
Cost			$149	$795	$48	$70			
Malt, bushels	28	347,328	2,013	24,064	567	4,284	19,261	118,792	90,227
Cost	$17	$218,659	$1,417	$13,780	$331	$3,112	$13,483	$56,761	$31,018
Fruits		$1,473		$6,188		$8,966			$400
Wine, gallons									
Cost									
Molasses, gallons									
Cost									918,826
Fuel	$402	$76,060	$3,053	$18,245	$960	$8,715	$2,589	$28,355	$36,518
Rent of power and heat		$50	$6		$150	$10			$27,571
Mill supplies		$9,095	$156	$1,703	$50	$271	$115	$385	$3,565
All other materials		$352,477	$1,685	$29,035	$270	$4,396	$9,366	$93,945	$60,314
Freight	$10	$8,672	$1,177	$8,171	$265	$792	$4,346	$190	$600
Products:									
Total value	$4,939	$5,357,615	$105,788	$939,510	$20,657	$257,385	$113,906	$2,698,984	$3,574,088
Alcohol and cologne spirits, proof gallons								1,180,825	2,719,219
Value								$1,479,546	$3,434,518
Whisky, proof gallons	4,992	7,185,303	122,882	965,421	24,584	199,484	277,194	899,983	66,001
Value	$4,839	$5,335,799	$104,306	$913,038	$20,657	$218,801	$110,878	$1,117,377	$90,193
Brandy, proof gallons		4,352		15,612		21,774			1,000
Value		$6,677		$19,038		$38,192			$750
Gin, proof gallons								7,073	
Value								$9,265	
Rum, proof gallons									22,500
Value									$32,625
Wine, gallons									1,000
Value									$750
All other products	$100	$15,139	$1,482	$7,434		$892	$3,028	$92,796	$15,252

	United States.	Alabama.	Arkansas.	California.	Connecticut.	Delaware.	Georgia.	Illinois.
Comparison of products:								
Number of establishments reporting for both years	486	9	11	4	15	11	13	15
Value for census year	$81,578,320	$53,657	$35,688	$22,641	$292,057	$50,091	$116,643	$36,628,782
Value for preceding business year	$78,809,483	$44,991	$33,699	$32,590	$273,086	$42,120	$117,064	$33,107,855
Power:								
Number of establishments reporting	538	10	10	4	9	8	13	18
Total horsepower	31,679	226	124	110	295	112	219	3,698
Owned—								
Engines—								
Steam, number	369	10	12	5	15	8	13	45
Horsepower	30,779	226	124	110	176	112	211	3,698
Gas or gasoline, number	8							
Horsepower	81							
Water wheels, number	24							
Horsepower	377				6		1	
Electric motors, number	8				119		8	
Horsepower	252							
Other power, number	2							
Horsepower	41							
Rented—								
Electric, horsepower	100							
Other kind, horsepower	49							
Furnished to other establishments, horsepower	12							
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	967	15	18	8	15	12	28	20
No employees	67	1	1		3	1	5	
Under 5	626	11	14	4	9	6	21	5
5 to 20	194	3	3	4	3	5	2	2
21 to 50	42							
51 to 100	26							6
101 to 250	4							
251 to 500	7							7
501 to 1,000	1							

[1] Includes establishments distributed as follows: Idaho, 1; Louisiana, 1; Nebraska, 2; New Hampshire, 1.

TABLE 16.—LIQUORS, DISTILLED, BY STATES AND TERRITORIES: 1900—Continued.

	Indiana.	Kentucky.	Maryland.	Massachusetts.	Missouri.	New Jersey.	New York.	North Carolina.	Ohio.
Comparison of products:									
Number of establishments reporting for both years	11	87	22	5	19	17	10	85	18
Value for census year	$9,325,480	$6,605,159	$1,457,407	$814,740	$47,925	$115,463	$1,177,035	$302,897	$12,186,053
Value for preceding business year	$9,599,500	$5,173,003	$1,117,764	$679,921	$46,857	$53,155	$1,335,488	$253,733	$12,907,826
Power:									
Number of establishments reporting	17	126	20	6	22	25	14	53	25
Total horsepower	2,782	11,918	1,130	265	401	455	424	1,067	2,863
Owned—									
Engines—									
Steam number	31	321	30	5	23	25	21	62	49
Horsepower	2,758	11,831	1,049	240	401	398	409	1,067	2,565
Gas or gasoline, number	1	3	1	.....	.....	2	.....	.....	1
Horsepower	20	15	8	.....	.....	20	.....	.....	18
Water wheels, number	1	.....	3	1	.....	5	1	.....	.....
Horsepower	4	.....	73	25	.....	37	15	.....	.....
Electric motors, number	.....	2	.....	.....	.....	.....	.....	.....	4
Horsepower	.....	32	.....	.....	.....	.....	.....	.....	180
Other power, number	.....	1	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	40	.....	.....	.....	.....	.....	.....	.....
Rented—									
Electric, horsepower	.....	.....	.....	.....	.....	.....	.....	.....	100
Other kind, horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	.....	.....	12	.....
Establishments classified by number of persons employed, not including proprietors and firm members:									
Total number of establishments	24	177	26	8	35	31	16	250	26
No employees	2	9	.....	1	7	2	1	11	1
Under 5	14	64	11	1	25	17	7	227	16
5 to 20	3	71	9	6	3	11	7	12	3
21 to 50	3	18	6	.....	.....	1	.....	.....	3
51 to 100	1	13	.....	.....	.....	.....	1	.....	2
101 to 250	1	1	.....	.....	.....	.....	.....	.....	1
251 to 500	.....	.....	.....	.....	.....	.....	.....	.....	.....
501 to 1,000	.....	1	.....	.....	.....	.....	.....	.....	.....

	Oklahoma.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Comparison of products:									
Number of establishments reporting for both years	.....	48	6	26	3	44	.....	4	3
Value for census year	.....	$5,304,146	$53,237	$597,623	$13,197	$151,697	.....	$2,669,836	$3,556,916
Value for preceding business year	.....	$3,792,606	$39,706	$459,745	$12,865	$90,518	.....	$1,826,418	$3,268,978
Power:									
Number of establishments reporting	1	68	16	31	5	29	2	4	2
Total horsepower	10	3,424	232	700	109	494	96	260	265
Owned—									
Engines—									
Steam, number	1	96	17	30	3	28	3	6	10
Horsepower	10	3,341	232	683	65	493	80	235	265
Gas or gasoline, number	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Water wheels, number	.....	4	.....	1	.....	.....	1	.....	.....
Horsepower	.....	63	.....	17	.....	.....	16	.....	.....
Electric motors, number	.....	1	.....	.....	.....	.....	.....	1	.....
Horsepower	.....	15	.....	.....	.....	.....	.....	25	.....
Other power, number	.....	.....	.....	.....	.....	1	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	1	.....	.....	.....
Rented—									
Electric, horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other kind, horsepower	.....	5	.....	.....	44	.....	.....	.....	.....
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Establishments classified by number of persons employed, not including proprietors and firm members:									
Total number of establishments	3	73	22	51	5	91	3	5	5
No employees	.....	8	1	1	.....	12	.....	.....	.....
Under 5	3	33	19	34	4	74	2	2	3
5 to 20	.....	21	2	15	1	5	.....	2	1
21 to 50	.....	9	.....	1	.....	.....	.....	1	.....
51 to 100	.....	1	.....	.....	.....	.....	1	.....	1
101 to 250	.....	1	.....	.....	.....	.....	.....	.....	.....
251 to 500	.....	.....	.....	.....	.....	.....	.....	.....	.....
500 to 1,000	.....	.....	.....	.....	.....	.....	.....	.....	.....

[1] Includes establishments distributed as follows: Idaho, 1; Louisiana, 1; Nebraska, 2; New Hampshire, 1.

THE MANUFACTURE OF WINE.

Table 17 is a comparative summary of statistics for wine manufacture as returned at the censuses of 1860 to 1900, inclusive, with the percentages of increase for each decade.

TABLE 17.—LIQUORS, VINOUS: COMPARATIVE SUMMARY, 1860 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.					PER CENT OF INCREASE.			
	1900	1890	1880	1870	1860	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870
Number of establishments	359	236	117	398	32	52.1	101.7	[1]70.6	1,143.8
Capital	$9,838,015	$5,792,783	$2,581,910	$2,334,394	$306,300	69.8	124.4	10.6	662.1
Salaried officials, clerks, etc., number	344	[2]234	[3]	[3]	[3]	47.0	.....	.....	.....
Salaries	$365,498	[2]$181,280	[3]	[3]	[3]	101.6	.....	.....	.....
Wage-earners, average number	1,163	1,048	967	1,486	106	11.0	8.4	[1]34.9	1,301.9
Total wages	$446,055	$299,453	$216,559	$280,650	$48,208	49.0	38.3	[1]6.1	378.4
Men, 16 years and over	1,099	1,016	781	1,426	102	8.2	30.1	[1]45.2	1,298.0
Wages	$436,857	$291,323	[3]	[3]	[3]	50.0	.....	.....	.....
Women, 16 years and over	61	26	57	32	4	134.6	[1]54.4	78.1	700.0
Wages	$8,808	$7,582	[3]	[3]	[3]	16.2	.....	.....	.....
Children, under 16 years	3	6	129	28	[3]	[1]50.0	[1]95.3	360.7	.....
Wages	$390	$548	[3]	[3]	[3]	[1]28.8	.....	.....	.....
Miscellaneous expenses	$552,338	$270,377	[4]	[4]	[4]	104.3	.....	.....	.....
Cost of materials used	$3,689,330	$1,318,012	$1,340,629	$1,203,172	$196,075	179.9	[1]1.7	11.4	513.6
Value of products	$6,547,310	$2,846,148	$2,169,193	$2,225,238	$400,791	130.0	31.2	[1]2.5	455.2

[1] Decrease.
[2] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 22.)
[3] Not reported separately
[4] Not reported.

The decade closing with 1860 witnessed the birth of commercial wine manufacture in the United States. The experiments of Nicholas Longworth at Cincinnati, Ohio, hereinafter referred to, were followed by the development of wine manufacture in the Hudson River Valley and the lake districts of New York, and in the Lake Erie district, comprising the southern shore of that lake and adjacent islands. At the census of 1860 California, New York, and Ohio were the leading three states in wine production. In 1870 the wine product of Missouri exceeded that of any other state, and in 1890 exceeded that of New York, though not that of California. With these exceptions, California, New York, and Ohio have been throughout the leading states in this industry. In 1900 their combined output was 22,404,085 gallons of wine, out of a total of 23,425,567 gallons for the United States.

From Table 17 it appears that while the industry made rapid progress from 1860 to 1870, in the succeeding ten years, from 1870 to 1880, there was a decrease in number of establishments of 281, or 70.6 per cent; in average number of wage-earners of 519, or 34.9 per cent; and in value of products of $56,045, or 2.5 per cent. During this decade a substantial increase in the industry was shown in Ohio and New York, and the decline for the entire United States, shown by the table, was chiefly due to conditions in the states of California and Missouri. Between 1870 and 1875 an enthusiastic interest in viniculture spread over California, resulting in a great increase in the acreage of vineyards. This caused an overproduction of wine, which was followed by ruinous depreciation in prices, entailing heavy losses to all classes of producers. Many vineyards were uprooted and the land given over to other lines of horticulture. In 1870 California reported 139 establishments, and in 1880 only 45. The large producers, however, as a rule had faith in the future, and continued to improve their properties, so that capital for the decade ending with 1880 showed a decline of only $18,820, or 2.9 per cent for the state, while there was an increase for the United States of $247,516, or 10.6 per cent. By 1879, as a result of the widening market for California wines, consumption had overtaken production and prices advanced, so that in 1880, notwithstanding the depreciation experienced during a portion of the decade, statistics for the state show a slight increase in value of products. The decline from $2,225,238 to $2,169,193 in the value of products for the United States was largely due to the general depression of the industry in Missouri, caused by the blight which greatly injured the grape crops of the state. Since 1880 the progress of wine manufacture in the United States has been continuous. During the forty years ending with 1900 the industry increased in number of establishments from 32 to 359; in capital, from $306,300 to $9,838,015; in number of wage-earners, from 106 to 1,163; in wages, from $48,208 to $446,055; and in value of products, from $400,791 to $6,547,310.

Table 18 is a comparison of the several items of capital as reported at the censuses of 1890 and 1900.

TABLE 18.—LIQUORS, VINOUS: COMPARATIVE SUMMARY, CAPITAL, 1890 AND 1900.

	1900	1890	Per cent of increase.
Total	$9,838,015	$5,792,783	69.8
Land	364,075	367,010	[1]0.8
Buildings	1,927,731	1,049,005	83.8
Machinery, tools, and implements	1,237,948	1,290,598	[1]4.1
Cash and sundries	6,308,261	3,086,170	104.4

[1] Decrease.

From Table 18 it appears that at the census of 1900 the capital amounted to $9,838,015, an increase of $4,045,232, or 69.8 per cent for the decade. This amount was distributed as follows: Land, $364,075; buildings, $1,927,731; machinery, tools, and implements, $1,237,948; and cash and sundries, $6,308,261. Of the four divisions of capital, cash and sundries shows the largest percentage of increase. This includes cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries. In 1900 the amount reported for these items was $6,308,261, and in 1890, $3,086,170, an increase of $3,222,091, or 104.4 per cent. As wine requires maturing or aging before it is marketable, and increases in value with each succeeding year, the quantity carried over by manufacturers from season to season is influenced by prices and general market conditions, and may be out of proportion to the quantity annually produced. For this reason the increase or decrease of live capital may, through "finished products on hand," be disproportionate to an advance or decline in the general conditions of the industry.

A slight decrease in the value of land is shown for the decade, but this is due to differences in inventories and estimates. While the capital invested in vineyards is increasing rapidly, the value of land actually utilized in the manufacture of wine may change but little. Wine-making establishments are often difficult of correct classification, because the industry includes both agricultural and manufacturing enterprise. In almost every state considerable quantities of wine are made from small vineyards attached to gardens or farms. Wine, when so manufactured, belongs to the agricultural products of the country, and at the Twelfth Census was returned to the division of agriculture. Such wines are made primarily for home consumption, although small quantities are often retailed in the neighborhood. In contradistinction to this class of producers are the large establishments, not engaged directly or indirectly in grape growing, which manufacture wine from must and grapes purchased in the open market, or on contract with vineyardists; these are purely manufacturing enterprises. Intermediate between these extremes are those establishments engaged in both grape growing and wine making, the winery being attached to the vineyard, and working into the finished product not only its own crops, but also those of neighboring vineyards. In such cases the two branches of enterprise in which each establishment is engaged have been separated, and there is included in this report only statistics of that branch of the industry relating to manufactures. Statistics pertaining to the growing and harvesting of grapes are included in the reports of the division of agriculture.

A slight decrease is shown in capital invested in machinery, tools, and implements, which decrease is due to the differences incident to inventories and estimates. The growth of the equipment for wine manufacture is better shown by the capital invested in buildings, which increased during the decade from $1,049,005 to $1,927,731, or 83.8 per cent. In this item increased cellarage, tanks, and cisterns are included. The equipment for wine making consists for the most part of tanks, cisterns, cooperage, cellarage, machinery for stemming and crushing grapes, and pumps and hose for moving the wine at different stages in the process of maturing. In California machines capable of stemming and crushing 300 tons of grapes daily are in use, and tanks or cisterns with a capacity for 25,000 to 30,000 gallons are common; the largest cistern in the state was constructed by the Italian-Swiss colony, and holds 500,000 gallons.

Table 18 does not include, for 1900, 12 idle establishments, with a capital of $70,026, and 113 active establishments, each with a product less than $500, with a capital of $55,542. The combined capital of these two classes was $125,568, making an aggregate capital for the industry of $9,963,583.

Table 19 summarizes, by states and territories, the statistics for the industry as reported at the censuses of 1890 and 1900.

TABLE 19.—LIQUORS, VINOUS: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
United States	1900	359	$9,838,015	344	$365,498	1,163	$446,055	$552,388	$3,689,330	$6,547,310
	1890	236	5,792,783	234	[1] 181,280	1,048	299,453	270,377	1,318,012	2,846,148
California	1900	187	4,658,625	106	124,465	526	224,849	265,487	2,526,768	3,937,871
	1890	128	3,729,418	121	99,872	735	190,658	142,512	840,222	1,738,863
Georgia	1900	6	38,360	3	1,350	6	1,225	3,482	7,815	15,875
	[2] 1890									
Illinois	1900	8	19,146			6	906	605	6,174	13,265
	[3] 1890									
Indiana	1900	3	26,720			13	4,612	1,652	6,070	18,400
	[3] 1890									
Iowa	1900	6	2,100			2	578	322	1,410	4,119
	[3] 1890									

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 22.)
[2] No establishments reported.
[3] Included in "all other states" for 1890.

TABLE 19.—LIQUORS, VINOUS: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900—Continued.

STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products.
				Number.	Salaries.	Average number.	Total wages.			
Massachusetts	1900	6	$33,700			5	$2,700	$1,589	$5,791	$19,685
	[1] 1890									
Michigan	1900	5	53,700	5	$2,085	5	1,975	1,400	6,878	15,109
	[2] 1890									
Missouri	1900	7	505,600	19	37,650	48	22,405	39,903	83,166	199,130
	1890	9	425,090	23	28,098	66	38,342	22,459	87,263	244,300
ebraska	1900	3	2,880			2	350	6	1,077	2,981
	[1] 1890									
New Jersey	1900	11	379,096	21	9,404	48	17,461	12,500	63,456	241,777
	1890	7	29,675	6	888	16	700	889	8,136	21,510
New York	1900	38	2,157,322	104	102,341	244	83,464	132,891	382,887	942,548
	1890	11	264,141	9	6,450	35	15,140	23,705	71,651	156,740
North Carolina	1900	5	76,190	25	37,000	56	9,030	16,585	109,695	224,980
	[2] 1890									
Ohio	1900	52	1,621,836	58	49,259	179	68,168	69,718	428,879	801,684
	1890	58	989,207	54	36,195	128	41,767	70,855	246,956	550,777
Pennsylvania	1900	3	130,631			7	1,700	961	29,446	53,800
	[1] 1890									
Virginia	1900	4	63,632	2	1,800	5	1,200	2,110	16,418	29,970
	[2] 1890									
Wisconsin	[3] 1900									
	1890	3	17,230	3	721	1	100	162	1,266	5,720
All other states	[4] 1900	15	67,477	1	144	16	5,437	3,127	13,405	26,116
	[5] 1890	20	338,027	18	9,056	72	12,846	9,795	62,518	128,238

[1] No establishments reported.
[2] Included in "all other states" for 1890.
[3] Included in "all other states" for 1900.
[4] Includes establishments distributed as follows: Alabama, 2; Arizona, 1; Florida, 1; Kansas, 2; Mississippi, 2; New Hampshire, 1; New Mexico, 1; Texas, 2; West Virginia, 1; Wisconsin, 2.
[5] Includes establishments distributed as follows: Connecticut, 1; Florida, 2; Illinois, 2; Indiana, 1; Iowa, 2; Michigan, 2; New Hampshire, 1; North Carolina, 2; Oregon, 1; Rhode Island, 1; South Carolina, 1; Texas, 2; Virginia, 2.

At the census of 1900, 15 states reported 344 establishments out of a total of 359 for the United States. In capital and value of products California ranked first, New York second, and Ohio third. In number of establishments these positions were reversed for New York and Ohio. The combined capital of these 3 states was $8,437,783, out of a total of $9,838,015 for the United States, and their combined product was valued at $5,682,103, out of a total value of $6,547,310. In this group of states New York showed the greatest percentage of increase in number of establishments, capital, and value of products, due to the growth of champagne manufacture in the Keuka Lake district.

Table 20 shows the quantity and cost of materials used and the quantity and value of products for the census year ending May 31, 1900.

TABLE 20.—LIQUORS, VINOUS: MATERIALS AND PRODUCTS, 1900.

	Unit of measure.	Quantity.	Cost of materials.	Value of products.
Materials:				
Total cost			$8,689,330	
Grapes	Pounds	376,503,987	2,752,416	
Fuel, and rent of power and heat			79,313	
Mill supplies			9,021	
All other materials			782,254	
Freight			66,326	
Products:				
Total value				$6,547,310
Still wines	Gallons	23,256,512		5,680,869
Effervescing wines	Gallons	169,055		664,972
Brandy	Proof gallons	114,185		100,651
All other products				98,793
Custom work				2,025

It appears from Table 20 that 23,425,567 gallons of wine were manufactured, of which 23,256,512 were still wines and 169,055 were effervescing wines, or champagnes. The total quantity shown in the table does not include 61,346 gallons reported from 113 small establishments, each with a product less than $500; 120,630 gallons reported from distilleries which made wine manufacture subsidiary to the distillation of spirits; and 8,217,512 gallons made on farms and reported on the agricultural schedules. The combined output of these three sources of supply was 8,399,488 gallons, which increased the total production of the United States to 31,825,055 gallons. The quantity of wine exported from the United States for the fiscal year ending June 30, 1900, one month later than the census year, was 1,438,421 gallons. The quantity imported for the same period was 4,412,035 gallons, of which 40,436 were exported, leaving 4,371,599 imported for domestic consumption. This was an excess of imports over exports of 2,933,178 gallons, which, added to the total production of the country, gives 34,758,233 gallons as the annual consumption of the United States, or less than one-half gallon per capita. Figures representing annual consumption are, at best, but close approximations. The quantity of domestic wine actually consumed does not correspond exactly with the excess of production over exports, because no fixed law governs the length of time wine is carried for aging or held by manufacturers for better prices; neither does the quantity of foreign wine consumed

within a given year correspond exactly with the importations. Data for closer approximations, however, are impossible to obtain.

Table 20 shows that 376,503,987 pounds, or 188,252 tons, of grapes were used to produce 23,425,567 gallons of wine, or an average of 124.4 gallons to each ton of grapes.

The average value of champagne was $3.93 per gallon and of still wine 24.4 cents. Contrary to popular supposition, California is not an extensive producer of champagnes. Of the 169,055 gallons of sparkling or effervescing wines reported for the United States at the census of 1900, 8,880 were returned from California, 15,600 from Ohio, 29,400 from Missouri, and 113,435 from New York.

In Ohio the quantity of wine produced from each ton of grapes was 154.8 gallons; in New York it was 151.5; and in California 118.8 gallons. These differences are due to the varying character of the seasons and to the different varieties of grapes grown for different classes of wine. Different kinds of grapes vary from 60 to 80 per cent in the yield of must. The average cost of grapes per ton in California, New York, and Ohio was $13.49, $18.94, and $19.71, respectively.

The production of brandy by wineries was reported as 114,185 gallons, of which 60,785 gallons were from California. This, however, is only a small fraction of the entire brandy product of the state, which approximated 3,000,000 gallons, of which more than 2,000,000 gallons were used for fortification of wine, and not separately reported. Brandy is a natural by-product of wine manufacture, being distilled from cheese, wash, or piquette. The quantity reported was so manufactured, or was distilled from wine, and does not change the figures in Table 20, from which the above averages were computed. Fifteen gallons of cheese, 10 to 12½ gallons of wash, or 7 gallons of piquette will produce 1 gallon of brandy. Certain grades of wine are sometimes distilled into brandy when the relative activity of the market in the two commodities makes it advantageous to do so; 5 gallons of sweet or 7 gallons of sour wine will, in distillation, produce 1 gallon of brandy. The internal-revenue tax of $1.10, which is collected on each proof gallon of distilled spirits, does not apply to brandy used in the fortification of wines, or to that deposited in bonded warehouses until it is withdrawn therefrom. According to the report of the Commissioner of Internal Revenue for the fiscal year ending June 30, 1900, 2,137,067 gallons of grape brandy were used in the fortification of angelica, port, sherry, Tokay, muscatel, and other varieties of sweet wines. This quantity was added to 7,544,342 gallons of wine, producing 8,815,441 gallons after fortification.

The wine product of the United States is small compared with that of other wine-producing countries. The estimated crop of the world, by countries, for the year 1901, was as follows:[1]

	Gallons.
France	1,530,223,200
Italy	1,013,760,000
Spain	520,080,000
Portugal	155,760,000
Algeria	146,440,800
Austria	116,160,000
Roumania	87,120,000
Chile	87,120,000
Russia	76,560,000
Bulgaria	73,920,000
Germany	60,720,000
Argentine Republic	55,440,000
Turkey and Cyprus	50,160,000
United States	39,600,000
Peru	36,960,000
Switzerland	31,680,000
Servia	23,760,000
Brazil	12,672,000
Australia	8,316,000
Madeira	7,920,000
Tunis	4,488,000
Cape Country	3,168,000
Uruguay	2,376,000
Mexico	924,000
Persia	765,600
Bolivia	660,000

According to this estimate, the United States ranked fourteenth in production, and the world's supply for 1901 was 4,146,753,600 gallons, or about 2.8 gallons per capita. In the opinion of United States Consul Covert, of Lyon, France, a general crisis for wine producers is impending, because of an overproduction in the entire world.[2]

Table 21 shows the quantity, value, and destination of wine exported from the United States for the fiscal year ending June 30, 1900.

TABLE 21.—LIQUORS, VINOUS: EXPORTS BY COUNTRIES, 1900.[3]

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
Aggregate	9,854	$49,927	1,408,859	$575,665
EUROPE.				
Total	1,155	8,992	451,670	209,917
Belgium	2	5	24,831	10,399
Denmark			3,972	1,622
France	318	1,712	10,442	6,608
Germany	267	1,164	132,738	78,320
Greenland, Iceland, etc.	1	10		
Italy	2	10	9	5
Netherlands			6,471	3,053
Russia—Baltic and White seas	5	28	4,631	3,152
Sweden and Norway			14,476	8,832
Switzerland			6,469	1,950
United Kingdom	560	6,063	247,631	95,976

[1] Advance Sheets, No. 1274, Consular Reports, February 25, 1902.
[2] Ibid.
[3] Commerce and Navigation of the United States: United States Treasury Department, Annual Report, 1900.

TABLE 21.—LIQUORS, VINOUS: EXPORTS BY COUNTRIES, 1900—Continued.

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
NORTH AMERICA.				
Total	3,922	$18,162	448,526	$177,489
Bermuda			374	184
British Honduras	45	225	5,185	2,060
Dominion of Canada:				
Nova Scotia, New Brunswick, etc.	1	10	249	172
Quebec, Ontario, Manitoba, etc.	89	436	3,277	1,783
British Columbia	417	1,906	40,762	16,974
Central American states:				
Costa Rica	121	465	9,732	4,364
Guatemala	760	2,879	46,347	19,363
Honduras	503	2,222	19,229	8,460
Nicaragua	413	1,639	31,428	14,540
Salvador	244	1,185	42,369	18,165
Mexico	926	4,456	211,730	76,285
Miquelon	15	51		
West Indies:				
British	181	1,598	6,814	3,130
Cuba	103	473	15,133	5,510
Danish	4	12	101	38
Haiti			1,829	664
Porto Rico	90	523	13,027	5,365
Santo Domingo	10	82	940	432
SOUTH AMERICA.				
Total	190	1,080	79,775	28,758
Argentina	1	8		
Brazil			1,330	658
Chile	22	141	3,384	1,427
Colombia	81	599	51,788	16,805
Ecuador	22	77	20,095	8,650
Peru	50	200	1,500	470
Venezuela	14	55	1,678	748

TABLE 21.—LIQUORS, VINOUS: EXPORTS BY COUNTRIES, 1900—Continued.

COUNTRIES.	IN BOTTLES.		IN OTHER COVERINGS.	
	Dozens of quarts.	Value.	Gallons.	Value.
ASIA.				
Total	1,419	$5,609	140,370	$50,792
Chinese Empire	410	1,725	38,756	15,895
East Indies, British	11	51	5,573	2,593
Hongkong	55	282	17,555	6,465
Japan	919	3,446	77,726	25,460
Korea	24	105	360	129
Russia—Asiatic			400	250
OCEANIA.				
Total	3,166	16,077	288,492	108,686
British Australasia	47	265	3,196	1,580
French Oceania	1	6	59,997	16,498
Guam	12	54	640	173
Hawaii	1,927	10,889	214,632	86,642
Philippine Islands	1,170	4,813	9,535	3,579
Tonga, Samoa, etc	9	45	592	214
AFRICA.				
Total	2	7	26	23
Liberia			26	23
Portuguese Africa	2	7		

This table shows that the exports were 1,438,421 gallons, with a value of $625,592. The United Kingdom purchased the greatest quantity, followed by Hawaii, Mexico, and Germany in the order named.

HISTORICAL AND DESCRIPTIVE.

Wine was manufactured before the dawn of history. The explanation of this is simple. It is the product of natural forces requiring neither mechanical powers nor manufacturing appliances. In the laboratory of earth and air, sugar is developed in the grape and in turn converted into alcohol. The vine and its fruit are as ancient and as widely distributed as the virgin forests of the earth. The accidental crushing of the grape and collecting of small quantities of its juice were followed by the discovery of its transformation and intoxicating properties after exposure to the air. Systematic observation followed close on accidental discovery, until chance gave way to design, and primitive wine making was ushered in.

The domestication of the vine and scientific methods of wine manufacture came many centuries later, and were among the first achievements of ancient husbandry. The time and labor required to plant and mature vineyards make them too valuable to be abandoned when once established. The cultivation of the vine was, therefore, incompatible with the pursuits of nomadic or seminomadic peoples, and the grape, like the olive, was, among the ancients, the symbol of settled and cultured life. The vine is especially susceptible to modification through culture or deterioration by transplantation, and while it is certain that the ancients cultivated many varieties, it is not possible to identify any of them with a modern botanical classification. The wines of Greece and Rome were highly flavored with spices and aromatic herbs, and in those countries viniculture attained its highest development in the vicinity of the Surrentine Hills and on the islands of the Ionian and Ægean seas. A detailed description of ancient methods of manufacture and the progress of viniculture westward with the movements of civilization to its installation and development in the modern wine provinces of Europe does not, however, fall within the scope of this report.

In that portion of the New World now within the boundaries of the United States, the native vines were distributed from ocean to ocean and from Michigan to Florida. Pre-Columbian adventurers from the North, driven by gales to the shores of the Atlantic, gave the name of Vinland to a portion of the coast; and all the American explorers after Columbus, at whatever point they touched the shore, or however far they penetrated the interior, found grapes in profusion and variety. The American colonists all came from countries in Europe where the manufacture of wine had for centuries been an important industry. It is true that viniculture in England had declined owing to the importation of French wines after the Norman Conquest, but the English colonists were none the less familiar with the beverage and its uses. It is but natural, therefore, that the attention of the different colonies should have been early attracted to the cultivation of the native

grape and its manufacture into wine as a possible source of revenue in the new country. Their hopes and expectations were greatly accentuated by the early writers, who gave florid descriptions of the abundance and luxuriance of the vines. In consequence, the efforts to introduce the culture of the grape for wine manufacture, made during our colonial period, were numerous, and common to all the settlements. Almost without exception, however, they were expensive and discouraging. In the more northern colonies the attempts were not long persevered in. This is particularly true of the colonies of New England. Massachusetts and her neighboring settlements had wild grapes, perhaps in as great abundance as Virginia, but interest in viniculture languished as the colony increased its exports of fish, lumber, and breadstuffs to the West Indies, Spain, Portugal, and the Wine Islands, receiving from those countries wines in reciprocal trade. In common with all the other colonies those of the South failed in their efforts to introduce European varieties of grapes and failed also in attempts to domesticate the native vine. The work of caring for vineyards, particularly the dressing of vines in a way to secure best results, requires workmen of a high order of intelligence, the exercise of which was incompatible with the system of slavery under which the vignerons were at first compelled to toil.

After the failure to acclimate European vines it is not strange that colonial wine manufacture proved unprofitable, because the product of the native grape could not, as an article of export, compete with the products of other countries, perfected by the accumulated experience of centuries of wine making; and domestic consumption in a new country is always insufficient to create a profitable demand. Wine making is profitable only in an advanced state of society with accumulated riches for the gratification of luxurious tastes.

The first wine manufactured in the United States was made from the native wild grapes by the Spanish colonists in Florida, about 1565. An attempt at grape culture was made in Virginia in 1610, three years after the settlement of Jamestown, by Frenchmen who came to the colony to plant a vineyard. Later, about 1620, the London Company sent French vineyardists to the colony for the same purpose. As far west as Kaskaskia, Ill., the French colonists in 1769 made wine from the wild grapes. In 1802 Congress made grants on the Ohio River in Indiana to John J. Dufour, a native of Switzerland, who had been experimenting with foreign varieties of grapes near Lexington, Ky., and who represented a colony of Swiss emigrants, including several members of his own family. The colony settled at New Switzerland (now Vevay, Ind.) to engage in the planting of vineyards and the making of wine. These emigrants carried on the culture of the grape in a small way for a number of years, attaining moderate success with the Madeira and other foreign varieties, but a greater measure of success with the Schuylkill, an offspring of the native fox grape. In 1810 the settlement had 8 acres in vineyards and made 2,400 gallons of wine, valued at $6,000. In 1818, 5,000 gallons were made which sold at $1 a gallon, but the fact that this product was from small vineyards attached to separate farms would seem to indicate that the industry was being neglected for other lines of agriculture.

The first statistical reports of the United States Government on wine manufacture are contained in the abstract of the census of 1810, compiled by Tench Coxe, and published at Philadelphia in 1814. From this abstract it appears that there were reported at the Third Census 14,191 distilleries, producing 22,977,167 gallons of spirits from fruit and grain and 2,827,625 gallons from molasses; 132 breweries making 182,690 barrels, or 5,754,735 gallons, of malt liquors; and wineries (number not mentioned) producing 11,755 gallons of wine, of which 9,230 gallons were made from currants and 2,525 from grapes. Of the total quantity of wine reported, 4,875 gallons were from Rhode Island, 4,480 from Pennsylvania, and 2,400 from Indiana. The Moravians had long carried on the manufacture of currant wine at Bethlehem, Pa., and Mr. Coxe in his report strongly urged its manufacture as being more profitable than that of grape wine. The total quantity of wine reported at the Third Census seems a small product after two hundred years of effort. It probably fell short of the real production, because it could not have included limited quantities made for home consumption from small and widely scattered vineyards attached to farms.

The first really successful attempt at wine making, and the one which might be regarded as the first of commercial importance, was made by Nicholas Longworth at Cincinnati, Ohio. He experimented first with vines procured from the Swiss settlement at Vevay, Ind., but later abandoned these for the Catawba, which he procured from John Adlum, of Georgetown, D. C. This particular variety of grape has played an important part in the development of the wine industry of the United States. In 1820 Mr. Adlum called the attention of Congress to the fact that he had succeeded in making a superior quality of wine from the Catawba grape, and asked the use of certain public lands in the District of Columbia for an experimental vineyard. His request was refused. Previously, in 1819, he had discovered a vine of the Catawba growing in the garden of an inn at Clarksburg, Md., and secured cuttings, which he planted in his vineyard on Rock Creek; and it was from him that Mr. Longworth, in 1825, secured cuttings for his vineyards at Cincinnati. This grape, when found by Mr. Adlum, was supposed to be a European variety, but is now thought to be a pure native. It was traced back to the Catawba River in North Carolina, from which it takes its name.

After the decline of the industry at Cincinnati, the

cultivation of the Catawba was continued on the islands near the southern shore of Lake Erie. It is still cultivated there, and on the mainland in the vicinity of Sandusky, with considerable success. The greatest Catawba region at the present day, however, is the Keuka Lake district in central New York, where the grapes ripen on the hillsides sloping down to the lake. In both the Ohio and New York districts this variety is largely used for the manufacture of American champagne. Mr. Longworth spent about forty years in trying to make American wine manufacture a success on the banks of the Ohio River, and at one time, about 1860, it was estimated that there were 2,000 acres in vineyards in the vicinity of Cincinnati. The decline of the industry in the Cincinnati district was due to the destruction of the vineyards by the black rot and the susceptibility to that disease of the varieties of grapes there cultivated.

Since the beginning of commercial wine manufacture, the states of New York and Ohio have maintained supremacy over the other states east of the Rocky Mountains, except at the census of 1870, when the product of Missouri exceeded the combined product of both those states, and at the census of 1890 exceeded that of New York. At the census of 1860 the total value of the product for the United States was $400,791; for New York, $155,966; and for Ohio, $47,275. At the census of 1870 the value for the United States was $2,225,238; for Missouri, $934,442; for New York, $296,668; and for Ohio, $309,375. At the census of 1880 the value for the United States was $2,169,193; for Missouri, $185,900; for New York, $375,150; and for Ohio, $773,110. At the census of 1890 the value for the United States was $2,846,148; for Missouri, $244,300; for New York, $156,740; and for Ohio, $550,777. At the census of 1900 the value for the United States was $6,547,310; for Missouri, $199,130; for New York, $942,548; and for Ohio, $801,634.

East of the Rocky Mountains the transplantation of European varieties of grapes for wine manufacture has not, to the present day, been attended with any measure of success. The Lake Erie district in Ohio, the lake districts of central New York, and the Hudson River Valley are the only producing sections of real importance, and here the rigors of the climate are inimical to the success of foreign varieties. All the wine manufactured in these districts is from pure natives or from natural and artificial hybrids.

In the state of California wine manufacture has had a rapid growth. There, contrary to the universal experience east of the Rocky Mountains, efforts to supplant indigenous vines by the acclimation of foreign varieties have been attended with a marked degree of success. Of the 23,425,567 gallons of wine reported at the census of 1900, 19,028,258 gallons were made in California. This is more than four times the combined output of all the other states, and practically all was made from European varieties which have adapted themselves to their new environment. The introduction of the foreign vine into California dates back to 1771. It was brought from Spain by way of Mexico through the instrumentality of the Catholic missions. The mission of San Gabriel planted the first vineyard, and the planting of vines extended from mission to mission until vineyards comprising from 5 to 30 acres stretched from San Diego to Sonoma. The labor was performed by the native Indians, whom the Spaniards reduced to slavery and taught the elementary lessons of grape culture. The variety cultivated was what is now known as the Mission grape. It proved to be of lasting favor with the Spanish fathers, because its wine resembled somewhat the red wines of old Castile. All the missions grew this one variety, but with the characteristic susceptibility of the vine to soil and climatic conditions the fruit took on various modifications in size, appearance, and flavor in the different localities where cultivated. For this reason, and because of different methods of treating the expressed juices, there was much variation in the general character and fineness of the wine. The Mission grape produced from 700 to 1,000 gallons of wine to the acre, and practically all was consumed in the neighborhood. There were no facilities for export; neither were there casks or bottles. For these reasons the industry can hardly be said to have reached the dignity of commercial importance, and its products were seldom seen in the marts of trade. The wine was fermented in cemented cisterns, where it was allowed to remain, or was drawn into hides or earthenware jars.

With the downfall of the Spanish power in Mexico the California missions waned, and with them viticulture declined also. In 1845 the missions were abolished and confiscated, and the Americans, when they came into possession, found both missions and vineyards in ruins. The concentrated interest of the people in the mining of gold, following its discovery in 1849, resulted in the neglect of agricultural pursuits, and grape growing and wine making remained undeveloped.

In 1856 statistics for the state showed approximately 1,500,000 vines, of which the Spanish settlement at Los Angeles had about 750,000. The others were scattered among the missions and Spanish ranches and were nurtured by irrigation. A. Haraszthy was the first to demonstrate the possibility of maturing grapes without irrigation by a system of stirring the soil around the roots of the vine. In 1858 he wrote an essay on vine planting and wine making which, with other literature on the subject, was given wide circulation by the State Agricultural Society. This so stimulated interest in viniculture that by 1862 the standing committee of the legislature reported 20,000,000 vines planted throughout the state.[1]

In 1861 a joint resolution of the legislature of Cali-

[1] Harper's Magazine, 1864, vol. 29, page 24.

fornia authorized and requested Governor Downey to appoint a commission to report "upon the ways and means best adapted to promote the improvement and growth of the grapevine in California."[1] Mr. Haraszthy, as a representative of this commission, visited the famous wine districts of Europe and purchased 100,000 vines, embracing about 1,400 different varieties, which were propagated at Sonoma. Cuttings from these vines were distributed among growers in different parts of the state. From that time the manufacture of wine in California has had a continuous and marvelous growth, interrupted only by the depreciation of prices through overproduction in certain years. In prolific seasons must has sold as low as 7 or 8 cents a gallon, which hardly equaled the cost of production. In 1860 the value of the product was $160,300; in 1870, $602,553, in 1880, $622,087; in 1890, $1,738,863; and in 1900, $3,937,871.

Since the introduction of European vines the product of California has included duplications, more or less perfect, of most of the well-known varieties of European wines. California embraces nearly ten degrees of latitude. With the ocean on the west and the altitudes rising into the mountains on the east, with the hills, valleys, rivers, and slopes, the state has such a variety of soil, slope, elevation, temperature, and climatic conditions as to reproduce, somewhere within its borders, any wine now manufactured. At present, however, the dry wines have the characteristic heaviness common to the wines of all southern countries, where warmth and sunshine develop a large proportion of sugar in the grape, which in fermentation is transformed into an excess of alcohol. In time, however, through the discovery of new districts, the evolution of new varieties of grapes, the accumulated experience of vineyardists and wine makers, and the adaptability of consumers to the article consumed, California will resolve itself into wine districts, the products of which will be prized as those of the famous wine provinces of Europe.

CLASSIFICATION AND NOMENCLATURE.

According to the quantity of sugar retained by the arrest of fermentation, wines are divided into sweet and dry; according to color, into red and white; and according to the quantity of carbonic acid gas generated in fermentation and retained under pressure, into still and effervescing wines (champagnes). The quantity of sugar contained in grapes used for wine making is influenced by many conditions, such as the variety of the grape, soil, climate, and the vicissitudes of the seasons, and will vary from 13 to 30 per cent. In fermentation sugar is converted into alcohol, and for the sweet wines the grapes rich in sugar content are chosen; before enough of the sugar is fermented out to convert the juice into a dry wine, some form of alcohol, preferably grape brandy, is added to give the requisite alcoholic strength and to arrest fermentation. Alcohol, by preventing further fermentation, fortifies against deterioration; hence the name "fortified," applied to all classes of sweet wines. Such wines invite adulteration or a deviation from natural processes of manufacture. Sugar, alcohol, and water may be added to the juice to the point of sacrificing its characteristic flavor, which would insure detection. In all wines there is considerable sugar remaining after the first violent fermentation, and by natural process this ferments out slowly through a considerable period of time. The extent to which it is fermented out determines the degree of dryness, as wines shade easily into either classification. Usually, however, grapes lighter in sugar content are chosen for dry wines, because the desired dryness can be secured by the fermentation of less sugar, leaving the wine of less alcoholic strength.

Red wines are made from grapes with highly colored skins, which are fermented with the juice, and from which the alcohol, formed by the fermentation of the sugar, absorbs the coloring matter. The alcohol also takes up certain acids and other ingredients from skins and stems, which give the red wines a distinct physiological effect, principally through the astringent properties of tannin. White wines are usually made from distinct types of light-colored grapes fermented without the skins.

Champagne is an effervescing wine, named from the province in France where it was first manufactured. Distinct types of grapes, as well as districts that will produce them, are necessary for its perfect production. The effervescence is due to carbonic acid gas generated in fermentation and retained under pressure. After the juice has passed through certain stages of fermentation it is bottled in heavy glass and tightly corked, the cork being bound in by wire passed over the mouth and around the neck of the bottle. Fermentation continues and the gas generated is confined, producing a natural "charging" which, on the opening of the bottle, gives to the wine its effervescence. The manufacture of champagne entails great labor, time, and skill. About three years are necessary to perfect it, and all this time it requires constant care and handling; at different stages of the process it must be uncorked to expel sediment. There are all grades of champagne sold in the markets, from an inferior grade of wine artificially "charged," to the wine of the highest type of grapes, perfected by natural processes.

Sweet and dry wines shade off into several types, rather than distinct classifications, and may be red or white, still or sparkling. These types take their names from provinces or from cities and towns in wine districts. Under these types are numerous brands named after valleys, villages, provinces, estates or chateaux, or after some fanciful name of the producer. A modern first-class hotel usually lists its wines under the headings of champagnes, clarets, Sauternes, Rhine wines, Burgundies, sherries, Madeiras, and ports. Champagnes are subdivided into foreign and domestic, and are classed as sweet, dry, and extra dry. Claret is a name given to dry reds or those of a general Bordeaux

[1] Appendix to Journals of Senate and Assembly, California, thirteenth session, 1862.

type; Sauternes, from a city near Bordeaux, are dry whites; Rhine wines are those from the wine districts of Germany along the Rhine River and are dry wines, usually white, but sometimes red; Burgundies, named from Burgundy, are dry wines, red or white, still or sparkling; sherries, from Xeres, Spain, are fortified wines, but, as some are much sweeter than others, they are designated as sweet or dry sherries, and are white or tinted still wines; Madeiras, after the island of Madeira, are much like sherries; ports, from Oporto, Portugal, are still wines, sweet, and usually red. Among the sweet wines, California manufactures large quantities of ports and sherries, and among the dry wines, clarets and Sauternes.

Table 22 gives detailed statistics of the wine industry, by states and territories, as reported at the census of 1900.

TABLE 22.—LIQUORS, VINOUS, BY STATES: 1900.

	United States.	California.	Georgia.	Illinois.	Indiana.	Iowa.	Massachusetts.	Michigan.
Number of establishments	359	187	6	8	3	6	6	5
Character of organization:								
Individual	236	124	4	7	1	6	5	3
Firm and limited partnership	47	27	.....	1	2	.....	1	1
Incorporated company	75	35	2	.....	.....	.....	.....	1
Miscellaneous	1	1	.....	.....	.....	.....	.....	.....
Capital:								
Total	$9,838,015	$4,658,625	$38,360	$19,146	$26,720	$2,100	$33,700	$53,700
Land	$364,075	$139,315	$240	$1,550	$520	$160	$2,300	$500
Buildings	$1,927,731	$866,971	$5,900	$4,950	$7,400	$910	$6,450	$2,200
Machinery, tools, and implements	$1,237,948	$699,750	$6,820	$2,160	$3,800	$715	$2,200	$9,000
Cash and sundries	$6,308,261	$2,952,589	$25,900	$10,486	$15,000	$315	$22,750	$42,000
Proprietors and firm members	329	172	4	9	5	6	7	5
Salaried officials, clerks, etc.:								
Total number	344	106	3	.....	.....	.....	.....	5
Total salaries	$365,498	$124,465	$1,350	.....	.....	.....	.....	$2,085
Officers of corporations—								
Number	64	24	2	.....	.....	.....	.....	2
Salaries	$114,614	$42,370	$1,250	.....	.....	.....	.....	$600
General superintendents, managers, clerks, etc.—								
Total number	280	82	1	.....	.....	.....	.....	3
Total salaries	$250,884	$82,095	$100	.....	.....	.....	.....	$1,485
Men—								
Number	256	80	1	.....	.....	.....	.....	3
Salaries	$242,695	$80,895	$100	.....	.....	.....	.....	$1,485
Women—								
Number	24	2	.....	.....	.....	.....	.....	.....
Salaries	$8,189	$1,200	.....	.....	.....	.....	.....	.....
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	2,358	1,173	8	28	15	13	5	16
Least number employed at any one time during the year	1,082	554	8	7	8	12	5	6
Average number	1,163	526	6	6	13	2	5	5
Wages	$446,055	$224,849	$1,225	$906	$4,612	$578	$2,700	$1,975
Men, 16 years and over—								
Average number	1,099	526	6	3	13	2	5	5
Wages	$436,857	$224,849	$1,225	$600	$4,612	$578	$2,700	$1,975
Women, 16 years and over—								
Average number	61	.....	.....	2	.....	.....	.....	.....
Wages	$8,808	.....	.....	$256	.....	.....	.....	.....
Children, under 16 years—								
Average number	3	.....	.....	1	.....	.....	.....	.....
Wages	$390	.....	.....	$150	.....	.....	.....	.....

	Missouri.	Nebraska.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Virginia.	All other states.[1]
Number of establishments	7	3	11	38	5	52	3	4	15
Character of organization:									
Individual	3	3	6	22	3	33	3	3	10
Firm and limited partnership	.....	.....	.....	5	2	6	.....	.....	2
Incorporated company	4	.....	5	11	.....	13	.....	1	3
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....	.....
Capital:									
Total	$506,600	$2,880	$379,096	$2,157,322	$76,190	$1,621,836	$130,631	$63,632	$67,477
Land	$13,800	$120	$12,850	$99,695	$5,160	$81,235	$2,700	$1,075	$2,355
Buildings	$188,100	$950	$84,840	$420,635	$35,375	$307,745	$16,700	$14,650	$13,955
Machinery, tools, and implements	$28,200	$560	$18,688	$185,555	$23,205	$238,969	$2,231	$7,275	$9,320
Cash and sundries	$326,500	$1,250	$262,718	$1,451,437	$12,450	$993,887	$109,000	$40,632	$41,847
Proprietors and firm members	3	3	6	31	7	49	3	3	16
Salaried officials, clerks, etc.:									
Total number	19	.....	21	104	25	58	.....	2	1
Total salaries	$37,650	.....	$9,404	$102,341	$37,000	$49,259	.....	$1,800	$144
Officers of corporations—									
Number	7	.....	1	11	.....	16	.....	.....	1
Salaries	$20,750	.....	$1,200	$27,100	.....	$21,200	.....	.....	$144
General superintendents, managers, clerks, etc.—									
Total number	12	.....	20	93	25	42	.....	2	.....
Total salaries	$16,900	.....	$8,204	$75,241	$37,000	$28,059	.....	$1,800	.....
Men—									
Number	12	.....	13	84	22	39	.....	2	.....
Salaries	$16,900	.....	$6,860	$71,596	$36,000	$27,059	.....	$1,800	.....
Women—									
Number	.....	.....	7	9	3	3	.....	.....	.....
Salaries	.....	.....	$1,344	$3,645	$1,000	$1,000	.....	.....	.....
Wage-earners, including pieceworkers, and total wages:									
Greatest number employed at any one time during the year	58	9	101	454	104	311	27	8	28
Least number employed at any one time during the year	38	6	31	179	45	154	10	4	15
Average number	48	2	43	244	56	179	7	5	16

[1] Includes establishments distributed as follows: Alabama, 2; Arizona, 1; Florida, 1; Kansas, 2; Mississippi, 2; New Hampshire, 1; New Mexico, 1; Texas, 2; West Virginia, 1; Wisconsin, 2.

TABLE 22.—LIQUORS, VINOUS, BY STATES: 1900—Continued.

	Missouri.	Nebraska.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Virginia.	All other states.
Wage-earners, including pieceworkers, and total wages—Continued.									
Wages	$22,405	$350	$17,461	$83,464	$9,030	$68,163	$1,700	$1,200	$5,437
Men, 16 years and over—									
Average number	45	2	37	220	39	170	7	5	14
Wages	$21,960	$350	$16,321	$79,473	$8,930	$67,227	$1,700	$1,200	$5,257
Women, 16 years and over—									
Average number	3		6	24	17	8			1
Wages	$445		$1,140	$3,991	$2,100	$756			$120
Children, under 16 years—									
Average number						1			1
Wages						$180			$60

	United States.	California.	Georgia.	Illinois.	Indiana.	Iowa.	Massachusetts.	Michigan.
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	837	368	4	3	8	2	5	4
February	827	353	4	3	13		5	4
March	847	352	4	4	13	3	5	4
April	863	331	4	5	15	2	5	4
May	881	330	4	5	15		5	4
June	856	322	4	3	15		5	4
July	836	319	8	2	15		5	4
August	1,019	458	11	2	15	4	5	6
September	1,671	997	8	5	15	7	5	8
October	1,939	1,100	5	4	15		5	14
November	1,564	879	5	3	10		5	4
December	1,038	513	5	2	8	2	5	4
Women, 16 years and over—								
January	22		1					
February	23		1					
March	28		4					
April	37		4					
May	84		3					
June	82		2					
July	59		4					
August	55		1					
September	127		4					
October	145		3					
November	52		1					
December	25		1					
Children, under 16 years—								
January	2							
February	2							
March	2							
April	2							
May	2							
June	3			1				
July	3			1				
August	4			1				
September	4			1				
October	4			1				
November	3			1				
December	3			1				

	Missouri.	Nebraska.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Virginia.	All other states.[1]
Average number of wage-earners, including pieceworkers, employed during each month:									
Men, 16 years and over—									
January	43		24	181	38	142	2	4	9
February	42		24	183	38	141	2	4	11
March	41		33	191	38	140	2	4	13
April	44		30	199	38	167	2	4	13
May	41		26	225	38	167	2	4	15
June	47	1	26	206	38	165	2	4	14
July	46	7	25	195	38	151	2	4	15
August	42	9	30	195	38	161	22	8	18
September	49	4	52	221	40	213	22	8	17
October	48		79	345	40	240	22	4	18
November	48		72	287	40	192	2	4	13
December	47		24	212	41	161	2	4	8
Women, 16 years and over—									
January	3		5	9		3			1
February	4		5	9		3			1
March	4		5	11		3			1
April	3		6	20		3			1
May	4		5	34	35	2			1
June	4		5	33	35	2			1
July	4		5	10	33	2			1
August			5	14	32	2			1
September	3		11	40	32	36			1
October	3		10	58	34	36			1
November	3		9	36		2			1
December	3		6	11		3			1
Children, under 16 years—									
January						1			1
February						1			1
March						1			1
April						1			1
May						1			1
June						1			1
July						2			1
August						2			1
September						2			1
October						1			1
November						1			1
December									

[1] Includes establishments distributed as follows: Alabama, 2; Arizona, 1; Florida, 1; Kansas, 2; Mississippi, 2; New Hampshire, 1; New Mexico, 1; Texas, 2; West Virginia, 1; Wisconsin, 2.

TABLE 22.—LIQUORS, VINOUS, BY STATES: 1900—Continued.

	United States.	California.	Georgia.	Illinois.	Indiana.	Iowa.	Massachusetts.	Michigan.
Miscellaneous expenses:								
Total	$552,338	$265,487	$3,482	$605	$1,652	$322	$1,589	$1,400
Rent of works	$39,017	$24,059	$120	.....	.....	$125	$190	$360
Taxes, not including internal revenue	$42,476	$24,984	$160	$70	$90	$47	$184	$380
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$470,708	$216,444	$3,202	$535	$1,562	$150	$1,215	$710
Contract work	$137	.....	.....	.....	.....	.....	.....	.....
Materials used:								
Total cost	$3,689,330	$2,526,768	$7,815	$6,174	$6,070	$1,410	$5,791	$6,878
Grapes, pounds	376,503,987	320,398,267	729,000	356,300	426,000	115,388	110,200	410,000
Cost	$2,752,416	$2,160,655	$6,980	$5,504	$4,520	$1,393	$1,671	$4,850
Fuel	$77,688	$62,197	$50	$80	$30	.....	$100	$52
Rent of power and heat	$1,625	$225	.....	.....	.....	.....	.....	.....
Mill supplies	$9,021	$6,210	.....	.....	$10	.....	$2	$25
All other materials	$782,254	$259,267	$785	$640	$1,510	$12	$4,000	$1,951
Freight	$66,326	$38,214	.....	.....	.....	.....	$18	.....
Products:								
Total value	$6,547,310	$3,937,871	$15,875	$13,265	$18,400	$4,119	$19,685	$15,109
Still wines, gallons	23,256,512	19,019,378	69,700	28,100	35,500	9,308	12,586	33,666
Value	$5,680,869	$3,817,582	$15,775	$12,675	$18,400	$3,919	$18,100	$14,519
Effervescing wines, gallons	169,055	8,880	.....	.....	.....	.....	.....	.....
Value	$664,972	$27,200	.....	.....	.....	.....	.....	.....
Brandy, gallons	114,185	60,785	.....	295	.....	.....	.....	.....
Value	$100,651	$36,635	.....	$590	.....	.....	.....	.....
All other products	$98,793	$56,454	.....	.....	.....	$200	$1,585	$90
Custom work	$2,025	.....	$100	.....	.....	.....	.....	$500
Comparison of products:								
Number of establishments reporting for both years	269	127	4	8	3	6	5	5
Value for census year	$5,203,519	$2,910,409	$2,525	$13,265	$18,400	$4,119	$18,725	$15,109
Value for preceding business year	$4,561,373	$2,897,211	$2,600	$14,050	$25,600	$3,910	$13,500	$15,700
Power:								
Number of establishments reporting	158	102	1	1	2	.....	1	1
Total horsepower	3,446	2,402	20	6	4	.....	8	10
Owned:								
Engines:								
Steam, number	172	104	1	1	2	.....	1	1
Horsepower	3,083	2,160	20	6	4	.....	8	10
Gas or gasoline, number	30	28	.....	.....	.....	.....	.....	.....
Horsepower	185	178	.....	.....	.....	.....	.....	.....
Water wheels, number	7	4	.....	.....	.....	.....	.....	.....
Horsepower	61	22	.....	.....	.....	.....	.....	.....

	Missouri.	Nebraska.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Virginia.	All other states.[1]
Miscellaneous expenses:									
Total	$39,903	$6	$12,500	$132,891	$16,585	$69,718	$961	$2,110	$3,127
Rent of works	$6,313	.....	$850	$1,925	.....	$4,810	$25	.....	$240
Taxes, including internal revenue	$865	$6	$933	$6,172	$413	$7,154	$368	$400	$300
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$32,725	.....	$10,692	$124,794	$16,172	$57,754	$456	$1,710	$2,587
Contract work	.....	.....	$25	.....	.....	.....	$112	.....	.....
Materials used:									
Total cost	$83,166	$1,077	$63,456	$382,887	$109,695	$428,879	$29,446	$16,413	$13,405
Grapes, pounds	2,581,400	42,600	3,205,600	16,904,642	2,745,500	27,078,190	141,600	396,000	863,300
Cost	$37,929	$852	$43,311	$160,095	$37,580	$266,854	$1,281	$9,420	$9,516
Fuel	$1,115	$65	$480	$4,081	$500	$8,627	.....	$108	$253
Rent of power and heat	.....	.....	.....	$180	.....	$1,220	.....	.....	.....
Mill supplies	$65	.....	$70	$1,113	$50	$1,101	.....	.....	$375
All other materials	$43,057	$160	$18,910	$209,548	$63,523	$143,270	$25,540	$6,885	$3,196
Freight	$1,000	.....	$685	$7,870	$8,042	$7,807	$2,625	.....	$65
Products:									
Total value	$199,130	$2,981	$241,777	$942,548	$224,980	$801,684	$53,800	$29,970	$26,116
Still wines, gallons	140,177	3,550	218,170	1,167,076	301,625	2,079,716	51,800	38,800	47,860
Value	$55,780	$2,835	$235,377	$479,812	$199,975	$698,965	$53,800	$28,200	$25,155
Effervescing wines, gallons	29,400	.....	1,440	113,435	.....	15,600	.....	300	.....
Value	$143,100	.....	$5,400	$449,472	.....	$39,000	.....	$800	.....
Brandy, gallons	.....	.....	.....	15,623	.....	36,592	.....	400	490
Value	.....	.....	.....	$9,110	.....	$52,685	.....	$970	$661
All other products	$250	$146	$1,000	$4,129	$25,005	$9,734	.....	.....	$200
Custom work	.....	.....	.....	$25	.....	$1,300	.....	.....	$100
Comparison of products:									
Number of establishments reporting for both years	6	3	9	30	2	45	1	3	12
Value for census year	$198,450	$2,981	$235,385	$870,012	$179,275	$633,898	$50,000	$26,850	$24,116
Value for preceding business year	$225,800	$2,750	$236,100	$699,272	$152,000	$690,300	$30,000	$29,700	$22,880
Power:									
Number of establishments reporting	2	.....	2	18	1	26	.....	.....	1
Total horsepower	46	.....	20	395	70	459	.....	.....	6
Owned—									
Engines—									
Steam, number	5	.....	2	22	1	31	.....	.....	1
Horsepower	46	.....	20	385	20	398	.....	.....	6
Gas or gasoline, number	.....	.....	.....	1	.....	1	.....	.....	.....
Horsepower	.....	.....	.....	1	.....	6	.....	.....	.....
Water wheels, number	.....	.....	.....	1	2	.....	.....	.....	.....
Horsepower	.....	.....	.....	4	35	.....	.....	.....	.....

[1] Includes establishments distributed as follows: Alabama, 2; Arizona, 1; Florida, 1; Kansas, 2; Mississippi, 2; New Hampshire, 1; New Mexico, 1; Texas, 2; West Virginia, 1; Wisconsin, 2.

TABLE 22.—LIQUORS, VINOUS, BY STATES: 1900—Continued.

	United States.	California.	Georgia.	Illinois.	Indiana.	Iowa.	Massachusetts.	Michigan.
Power—Continued.								
Owned—								
Electric motors, number	5	2	.....	.....	.....	.....	.....	.....
Horsepower	80	15	.....	.....	.....	.....	.....	.....
Rented—								
Electric, horsepower	87	27	.....	.....	.....	.....	.....	.....
Furnished to other establishments, horsepower	80	80	.....	.....	.....	.....	.....	.....
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	359	187	6	8	3	6	6	5
No employees	36	12	.....	1	.....	.....	4	1
Under 5	183	100	5	6	2	6	2	1
5 to 20	105	62	1	.....	1	.....	.....	3
21 to 50	30	11	.....	1	.....	.....	.....	.....
51 to 100	5	2	.....	.....	.....	.....	.....	.....

	Missouri.	Nebraska.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Virginia.	All other states.[1]
Power—Continued.									
Owned—									
Electric motors, number	.....	.....	.....	.....	3	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	15	.....	.....	.....	.....
Rented—									
Electric, horsepower	.....	.....	.....	5	.....	55	.....	.....	.....
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Establishments classified by number of persons employed, not including proprietors and firm members:									
Total number of establishments	7	3	11	38	5	52	3	4	15
No employees	.....	1	3	2	2	1	.....	3	6
Under 5	5	1	2	8	1	34	1	1	8
5 to 20	.....	1	4	18	.....	13	1	.....	1
21 to 50	2	.....	1	9	1	4	1	.....	.....
51 to 100	.....	.....	1	1	1	.....	.....	.....	.....

[1] Includes establishments distributed as follows: Alabama, 2; Arizona, 1; Florida, 1; Kansas, 2; Mississippi, 2; New Hampshire, 1; New Mexico, 1; Texas, 2; West Virginia, 1; Wisconsin, 2.

TOBACCO.

TOBACCO.

By JOHN H. GARBER.

For the census of 1900, manufactures of tobacco were divided into three groups or classes, namely: Cigars and cigarettes; chewing and smoking tobacco and snuff; and tobacco, stemmed and rehandled. Statistical inquiries were grouped correspondingly, and the principal statistics for each classification and the combined totals are presented in Table 1.

TABLE 1.—MANUFACTURES OF TOBACCO: SUMMARY FOR 1900.

	Total.	Cigars and cigarettes.	Chewing and smoking tobacco and snuff.	Tobacco stemming and rehandling.
Number of establishments	15,252	14,539	437	276
Capital:				
Total	$124,089,871	$67,706,493	$43,856,570	$12,526,808
Land	$6,203,407	$3,946,170	$1,917,427	$339,810
Buildings	$13,588,195	$6,242,594	$6,359,738	$985,863
Machinery, tools, and implements	$10,194,150	$3,635,106	$6,119,777	$439,267
Cash and sundries	$94,104,119	$53,882,623	$29,459,628	$10,761,868
Salaried officials, clerks, etc., number	8,262	4,470	3,368	424
Salaries	$8,951,534	$4,712,786	$3,884,071	$354,677
Wage-earners, average number	142,277	103,462	29,161	9,654
Total wages	$49,852,484	$40,925,596	$7,109,821	$1,817,067
Miscellaneous expenses	$79,495,422	$31,436,701	$47,533,705	$525,016
Cost of materials used	$107,182,656	$57,946,020	$35,038,287	$14,198,349
Value of products	$283,076,546	$160,223,152	$103,754,362	$19,099,032

The value of cigars and cigarettes was 56.6 per cent of the total value of all tobacco manufactures; chewing and smoking tobacco and snuff, 36.7 per cent; and tobacco, stemmed and rehandled, 6.7 per cent. The manufacturers of cigars and cigarettes, and of chewing and smoking tobacco and snuff, use a considerable quantity of material as it comes from establishments engaged in the business of stemming and rehandling, and there is, therefore, for the three classes of tobacco factories, a duplication of values such as is common to correlative industries some of which use material in partially manufactured form.

Through the excise system of the General Government the Bureau of Internal Revenue comes into possession of statistics of materials used in tobacco manufacture, and also of the quantity of the different classes of finished products. This information is given to the public in the form of annual reports by the Commissioner of Internal Revenue, which reports, however, do not include statistics of capital, wage-earners, wages, cost of materials, miscellaneous expenses, or value of products. The tabulations of the Census Office for this manufacture are designed to present information supplementary to that published by the Bureau of Internal Revenue, duplicating only the number of establishments. In this item, however, the reports of the two bureaus can not be expected to agree because of the elimination of very small establishments by the Census Office from its canvass and the difference in methods of classification.

Table 2 shows the quantity of leaf tobacco used in the three principal groups of its manufactures, for each fiscal year from 1890 to 1900, inclusive. This table is taken from the reports of the Commissioner of Internal Revenue, 1900 and 1901.

TABLE 2.—LEAF TOBACCO: QUANTITY USED IN MANUFACTURES, 1890 TO 1900, INCLUSIVE.

[From reports of Internal Revenue Commissioner 1900 and 1901.]

YEAR.	NUMBER OF POUNDS OF LEAF TOBACCO USED.			
	Total.	Cigars.	Cigarettes.	Tobacco and snuff.
1890	311,862,784	[1] 91,746,811	.....	220,116,473
1891	332,511,067	85,435,928	9,115,810	237,959,329
1892	339,012,619	90,875,830	9,907,222	238,229,567
1893	312,907,679	84,428,797	12,497,183	215,981,699
1894	317,640,403	77,359,405	12,614,409	227,666,589
1895	323,656,332	77,499,875	16,094,338	230,062,119
1896	308,398,583	75,938,866	19,114,190	213,345,527
1897	357,171,033	78,786,071	17,477,402	260,957,560
1898	349,877,737	85,437,974	17,081,349	247,358,414
1899	367,189,310	93,746,678	14,416,947	258,975,685
1900	379,162,884	105,895,189	13,084,097	260,683,658

[1] Includes cigarettes.

Table 3 shows the production of leaf tobacco, by states and territories, as reported on the agricultural schedules at the censuses of 1840 to 1900, inclusive.

TABLE 3.—QUANTITY OF TOBACCO GROWN, BY STATES AND TERRITORIES: 1840 TO 1900.

STATES AND TERRITORIES.	1900	1890	1880	1870	1860	1850	1840
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
United States	868,163,275	488,256,646	472,661,157	262,735,341	434,209,461	199,752,655	219,163,319
Alabama	311,950	162,430	452,426	152,742	232,914	164,990	278,302
Arizona	100	2	600	100	.....	.....	.....
Arkansas	831,700	954,790	970,220	594,886	989,980	218,936	148,439
California	23,490	12,907	78,317	63,809	3,150	1,000	.....
Colorado	.....	120	.....	890	.....	.....	.....

TABLE 3.—QUANTITY OF TOBACCO GROWN, BY STATES AND TERRITORIES: 1840 TO 1900—Continued.

STATES AND TERRITORIES.	1900	1890	1880	1870	1860	1850	1840
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
Connecticut	16,930,770	8,874,924	14,044,652	8,328,798	6,000,133	1,267,624	471,657
Dakota	940	785	1,897		10		
Delaware	2,000	29,680	1,278	250	9,699		272
District of Columbia			1,400		15,200	7,800	55,550
Florida	1,125,600	470,448	21,182	157,405	828,815	998,614	75,274
Georgia	1,105,600	263,752	228,590	288,596	919,318	423,924	162,894
Hawaii	50,410						
Idaho	750		400				
Illinois	1,447,150	3,042,936	3,935,825	5,249,274	6,885,262	841,894	564,326
Indiana	6,882,470	7,710,297	8,872,842	9,325,392	7,993,378	1,044,620	1,820,306
Indian Territory	97,030						
Iowa	127,420	74,396	420,477	71,792	303,168	6,041	8,076
Kansas	45,960	62,083	191,669	33,241	20,349		
Kentucky	314,288,050	221,880,303	171,120,784	105,305,869	108,126,840	55,501,196	53,436,909
Louisiana	102,100	46,845	55,954	15,541	39,940	26,878	119,824
Maine	150	200	250	15	1,583		30
Maryland	24,589,480	12,856,838	26,082,147	15,785,339	38,410,965	21,407,497	24,816,012
Massachusetts	6,406,570	2,794,848	5,369,436	7,312,885	3,233,198	138,246	64,955
Michigan	64,580	11,984	83,969	5,385	121,099	1,245	1,602
Minnesota	127,730	23,285	69,922	8,247	38,938		
Mississippi	62,760	62,111	414,668	61,012	159,141	49,960	83,471
Missouri	3,041,996	9,424,823	12,015,657	12,320,488	25,086,196	17,113,784	9,067,913
Montana	200	25		600			
Nebraska	5,765	11,049	57,979	5,988	3,636		
Nevada			1,500	25			
New Hampshire	181,644	86,593	170,848	155,334	18,581	50	115
New Jersey	720	33,855	172,315	40,871	149,485	310	1,922
New Mexico	1,460	1,415	890	8,587	7,044	8,467	
New York	13,958,370	9,316,135	6,481,431	2,349,798	5,764,582	83,189	744
North Carolina	127,503,400	36,375,258	26,986,213	11,150,087	32,853,250	11,984,786	16,772,359
Ohio	65,957,100	37,853,563	34,735,285	18,741,973	25,092,581	10,454,449	5,942,275
Oklahoma	11,880						
Oregon	4,630	3,325	17,325	3,847	405	325	
Pennsylvania	41,502,620	28,956,247	36,943,272	3,467,539	3,181,586	912,651	325,018
Rhode Island			785	796	705		317
South Carolina	19,895,970	222,898	45,678	34,805	104,412	74,285	51,519
Tennessee	49,157,550	36,368,395	29,365,052	21,465,452	43,448,097	20,148,932	29,550,432
Texas	550,120	175,706	221,283	59,706	97,914	66,897	
Utah						70	
Vermont	291,390	70,518	181,432	72,671	12,245		585
Virginia	122,884,900	48,522,655	79,988,868	37,086,364	123,968,312	56,803,227	75,347,106
Washington	1,180	7,040	6,930	1,682	10		
West Virginia	3,087,140	2,602,021	2,296,146	2,046,452			
Wisconsin	45,500,480	19,389,166	10,608,423	960,813	87,340	1,268	115

The total production of the United States for 1900 was 868,163,275 pounds, an increase of 379,906,629 pounds, or 77.8 per cent, over the crop of 1890. All the states and territories were represented except Colorado, District of Columbia, Nevada, Rhode Island, and Utah, but the cultivation of tobacco on a large scale was confined to comparatively few states. The crop of only 18 states exceeded 1,000,000 pounds each, and that of 13 states, 5,000,000 pounds each. Eight states produced more than 20,000,000, and 3 states more than 100,000,000 pounds each. Kentucky, North Carolina, Virginia, Ohio, and Tennessee, in the order named, were the greatest 5 producers, whose combined crop was 679,791,000 pounds, or 78.3 per cent of the entire production. Kentucky alone produced 36.2 per cent of the entire crop of the United States. The genesis of American tobacco culture was in Virginia, and that state exceeded any other in quantity grown until 1870, when Kentucky took first place. Among the leading producers, North Carolina showed the greatest percentage of increase for the decade between the Eleventh and Twelfth censuses, and in 1900 ranked second in quantity grown, Virginia being third. The 868,163,275 pounds shown in Table 3 as the total production of the United States was valued at $56,993,003, or an average of 6.6 cents a pound. This was grown from 1,101,483 acres of land, distributed among 308,317 farms, the average crop being 788.2 pounds per acre. It is estimated upon the experience of a series of years that the United States grows approximately one-half of the world's supply of tobacco.

During the fiscal year ending June 30, 1900, the United States exported 344,655,697 pounds of unmanufactured tobacco, consisting of leaf, stems, and trimmings. Table 4, compiled from "Commerce and Navigation of the United States, Bureau of Statistics, Treasury Department," shows by countries the imports and foreign and domestic exports of tobacco and its manufactures for the fiscal year 1900.

TABLE 4.—MANUFACTURED AND UNMANUFACTURED TOBACCO: IMPORTS AND FOREIGN AND DOMESTIC EXPORTS, BY COUNTRIES, FISCAL YEAR 1900.

IMPORTS.[1]

COUNTRIES.	TOBACCO, AND MANUFACTURES OF.						
	Leaf.				Manufactures of—		
	Suitable for cigar wrappers.		Other.		Cigars, cigarettes, and cheroots.		All other.
	Pounds.	Dollars.	Pounds.	Dollars.	Pounds.	Dollars.	Dollars.
EUROPE.							
Austria-Hungary	9	14	31,008	14,329			1,282
Azores, and Madeira Islands							
Belgium	5	5	6,014	477	10	45	16
Denmark							85
France			3,170	734	53	234	3,544
Germany	92,925	87,822	170,903	50,396	1,869	5,350	1,701
Gibraltar							
Greece					36	48	83
Greenland, Iceland, etc							
Italy					66	197	2,554
Malta, Gozo, etc			6,434	763			
Netherlands	5,048,194	4,558,143	52,976	11,128	27	32	43
Portugal							
Russia:					21	71	2
Baltic and White Seas							
Black Sea			6,905	1,111			
Spain							
Sweden and Norway							12
Switzerland							8
Turkey in Europe					228	740	
United Kingdom	1,649	708	669,205	214,041	19,065	74,354	14,617
NORTH AMERICA.			56,884	22,235			
Bermuda							
British Honduras			6	3			
Dominion of Canada:							
Nova Scotia, New Brunswick, etc							2
Quebec, Ontario, Manitoba, etc	230,865	203,795	175,026	88,674	18	9	2,423
British Columbia	151	151	458	341	21	43	272
Newfoundland and Labrador	493	140	338	136			
Central American States:							
Costa Rica							
Guatemala							
Honduras			24	5			
Nicaragua							
Salvador							
Mexico	7,161	4,853	296,503	77,786	7,196	12,534	11
Miquelon, Langley, etc							
West Indies:							
British	171	347	2,585	1,482	183	980	
Cuba	131,494	233,568	11,272,334	7,382,423	419,243	2,185,907	5,795
Danish							
Dutch			581	229			
French							
Haiti							
Porto Rico	32,895	14,299	1,127,506	244,219	9,688	12,842	426
Santo Domingo							
SOUTH AMERICA.							
Argentina							
Bolivia							
Brazil	4	2	10	2			26
Chile							
Colombia	12	11					
Guianas:							
British							
Dutch							
French							
Peru							
Uruguay							
Venezuela	2	2	1,123	629			
ASIA.							
Aden							
Chinese Empire			454	77	52	130	23,811
China—British			100	25			
East Indies:					126	118	
British							
Dutch	15,388	18,476					
French							
Hongkong			4,430	629	86	75	7,110
Japan			406	56	76	328	261
Korea							
Russia—Asiatic							
Turkey in Asia			161,984	61,197	47	136	3
All other Asia							
OCEANIA.							
British Australasia							
French Oceania							
German Oceania							
Guam							
Hawaii					13	26	
Philippine Islands	150	23	1,685	301	921	1,068	
Tonga, Samoa, etc							
AFRICA.							
British Africa							
Canary Islands							
French Africa							
German Africa							
Liberia							
Portuguese Africa							
Turkey in Africa							
Egypt			9,557	1,486	1,514	4,656	127
All other Africa							
Total	5,561,068	5,122,359	14,058,559	8,174,864	460,559	2,299,928	64,214

[1] Commerce and Navigation of the United States, United States Treasury Department, 1900.

TABLE 4.—MANUFACTURED AND UNMANUFACTURED TOBACCO: IMPORTS AND FOREIGN AND DOMESTIC EXPORTS, BY COUNTRIES, FISCAL YEAR 1900—Continued.

EXPORTS—DOMESTIC.[1]

COUNTRIES.	TOBACCO, AND MANUFACTURES OF.										
	Unmanufactured.				Manufactured.						
	Leaf.		Stems and trimmings.		Cigars.		Cigarettes.		Plug.		All other.
	Pounds.	Dollars.	Pounds.	Dollars.	M.	Dollars.	M.	Dollars.	Pounds.	Dollars.	Dollars.
EUROPE.											
Austria-Hungary	124,735	12,688									
Azores and Madeira Islands	1,795	189							1,000	250	22
Belgium	17,122,797	1,467,748	23,503	830	6	188	2,217	4,617	232,789	44,090	64,488
Denmark	113,621	11,037	156,702	12,362			17,754	50,212	12,295	3,396	724
France	38,584,488	2,999,118			22	893	1,116	3,762	11,480	2,706	6,563
Germany	52,525,167	4,911,382	4,951,322	144,824	11	431	13,165	37,656	257,355	55,991	66,279
Gibraltar	598,885	44,249	48,273	1,875			386	631	89,791	17,264	8,193
Greece							10	73			
Greenland, Iceland, etc					1	60					
Italy	38,372,301	3,665,692			5	150	90	366			599
Malta, Gozo, etc	336,656	14,853	14,524	428			987	1,654	46,385	10,428	315
Netherlands	19,932,942	1,302,841	4,095,928	78,040	5	235	5,950	13,733	242,788	51,970	6,696
Portugal	288,433	29,085									
Russia:											
Baltic and White seas	6,800	888									
Black Sea	7,000	750									
Spain	13,772,478	661,842			2	25					
Sweden and Norway	2,272,022	201,695	247,666	7,850			47,730	124,058			710
Switzerland							3,240	6,653	131	47	880
Turkey in Europe											
United Kingdom	121,793,251	10,957,441	165,819	4,275	280	8,821	109,926	255,558	4,159,046	859,648	106,870
NORTH AMERICA.											
Bermuda	13,573	1,082			38	1,459	1,696	5,148	27,245	6,351	1,601
British Honduras	95,990	8,408			9	199	3,092	3,874	10	4	748
Dominion of Canada:											
Nova Scotia, New Brunswick, etc	195,796	31,630				7	105	166	567	231	903
Quebec, Ontario, Manitoba, etc	9,373,700	902,633	347,550	8,796	75	3,038	26	82	26,703	6,600	26,305
British Columbia	112,754	17,399			10	385	48	60	66,804	20,077	19,954
Newfoundland and Labrador	273,395	15,318	200	5			675	2,137	87,068	14,770	22,060
Central American states:											
Costa Rica	138,059	22,565			3	35	2	6	252,281	43,351	2,330
Guatemala							301	331			1,170
Honduras	3,396	427					572	868	153	52	466
Nicaragua	17,499	2,285			1	35			12,802	1,962	4,269
Salvador											160
Mexico	2,686,758	182,938					5	10	9,760	2,429	4,589
Miquelon, Langley, etc	2,439	337							7,145	1,028	500
West Indies:											
British	1,283,051	115,584			49	1,941	8,744	11,522	117,052	23,552	16,466
Cuba	498	100			6	217	193	648	1,102,489	188,256	7,442
Danish	123,819	9,750					373	910	4,570	1,183	895
Dutch	128,391	17,221							355,508	53,603	8,381
French	494,495	33,430					50	40	4,000	900	125
Haiti	922,905	85,988			1	40			2,375	418	789
Porto Rico	2,055	185			2	54			492	142	368
Santo Domingo							2	8			284
SOUTH AMERICA.											
Argentina	261,984	23,394			14	200	160	486	548	137	23,331
Bolivia							3,000	2,460			25
Brazil	22,453	3,496			12	410					47
Chile	5,308	687			1	11	31	90	38,970	9,949	368
Colombia	89,606	13,107			48	240	56	163	16,403	3,777	3,668
Guianas:											
British	488,301	42,642			1	60	55	159			1,671
Dutch	116,861	9,218					82	154			3,448
French	59,291	6,179							4,271	529	111
Peru	7,605	804			10	336	40	138	285	57	92
Uruguay	195,457	14,485					149	457	320	66	227
Venezuela	280,283	29,711			3	178			181,066	28,580	15,792
ASIA.											
Aden							1,300	1,761	3,120	516	
Chinese Empire	459,469	44,473			20	170	357,864	494,798	59,769	16,110	7,207
China—British											
East Indies:											
British	20,037	2,885			4	50	142,983	159,879	158,838	25,898	48,588
Dutch							694	998	976	154	14,407
French							50	40			
Hongkong					25	550	17,075	27,074	55,254	11,127	12,786
Japan	3,104,472	322,362			7	150	78,265	95,988	40,851	7,651	3,413
Korea							1,500	1,960			70
Russia—Asiatic											240
Turkey in Asia											
All other Asia							600	695			
OCEANIA.											
British Australasia	3,765,957	546,809			388	20,450	120,690	397,454	4,110,093	1,028,818	252,860
French Oceania					1	18					503
German Oceania											7,973
Guam											482
Hawaii					1,308	29,317	32,010	66,608	7,486	1,746	235,093
Philippine Islands	928	275			120	2,318	3,000	9,145	860	207	823
Tonga, Samoa, etc											120
AFRICA.											
British Africa	2,630,760	241,501			91	1,952	186,149	505,234	301,259	66,546	3,074
Canary Islands	687,279	62,979							81,571	10,741	6
French Africa	598,802	56,784					10	27			5
German Africa	1,600	432									
Liberia	11,655	875									
Portuguese Africa	111,558	9,723					138	330	1,250	236	81
Turkey in Africa											
Egypt									1,380	200	
All other Africa	17,650	1,687							3,870	1,131	1,101
Total	334,604,210	29,163,086	10,051,487	259,285	2,579	74,623	1,164,356	2,290,876	12,198,474	2,624,870	1,019,772

[1] Commerce and Navigation of the United States, United States Treasury Department, 1900.

TABLE 4.—MANUFACTURED AND UNMANUFACTURED TOBACCO: IMPORTS AND FOREIGN AND DOMESTIC EXPORTS, BY COUNTRIES, FISCAL YEAR 1900—Continued.

EXPORTS—FOREIGN.[1]

COUNTRIES.	TOBACCO, AND MANUFACTURES OF.						
	Leaf.				Manufactures of—		
	Suitable for cigar wrappers.		Other.		Cigars, cigarettes, and cheroots.		All other.
	Pounds.	Dollars.	Pounds.	Dollars.	Pounds.	Dollars.	Dollars.
EUROPE.							
Austria-Hungary							
Azores, and Madeira Islands							
Belgium	2,024	615					820
Denmark							
France	96	75			40	104	
Germany	29,460	20,214	286,846	71,733	10	33	675
Gibraltar							
Greece							
Greenland, Iceland, etc							
Italy							
Malta, Gozo, etc							
Netherlands	94,896	73,543	24,880	4,988	3	6	
Portugal							
Russia:							
Baltic and White seas							
Black Sea							
Spain							
Sweden and Norway							
Switzerland							
Turkey in Europe							
United Kingdom	832	159	10,814	5,187	470	1,719	
NORTH AMERICA.							
Bermuda							
British Honduras					4,120	5,638	
Dominion of Canada:							
Nova Scotia, New Brunswick, etc	7,105	5,231	5,959	2,920			1
Quebec, Ontario, Manitoba, etc	515,120	454,295	902,087	345,216	570	2,982	2,121
British Columbia	4,510	3,993	7,361	4,788	482	2,081	18
Newfoundland and Labrador							
Central American States:							
Costa Rica					322	1,273	5
Guatemala	169	135			407	726	159
Honduras					10	29	
Nicaragua			100	16	898	2,055	
Salvador							
Mexico	771	762	1,538	588	659	625	164
Miquelon, Langley, etc							
West Indies:							
British	17,087	13,226	521	177			
Cuba	2,395	490	1,932	577	133	94	5
Danish							
Dutch	237	450	80	82			
French							
Haiti	162	148	220	119			
Porto Rico	1,422	950	29,791	4,341			
Santo Domingo							
SOUTH AMERICA.							
Argentina							
Bolivia							
Brazil							
Chile							
Colombia			231	98	409	782	149
Guianas:							
British							
Dutch							
French							
Peru							
Uruguay							
Venezuela			221	119			
ASIA.							
Aden							
Chinese Empire							
China—British							
East Indies:							
British							
Dutch							
French							
Hongkong					76	482	
Japan					197	778	
Korea							
Russia—Asiatic							
Turkey in Asia							
All other Asia							
OCEANIA.							
British Australasia	1,947	597	2,047	820	48	151	
French Oceania					71	311	22
German Oceania							
Guam							
Hawaii					1,677	6,651	362
Philippine Islands	50	13	150	23	908	807	10
Tonga, Samoa, etc							
AFRICA.							
British Africa							
Canary Islands							572
French Africa							
German Africa							
Liberia							
Portuguese Africa							
Turkey in Africa							
Egypt							
All other Africa							
Total	678,283	574,896	1,224,728	441,787	11,510	27,326	5,078

[1] Commerce and Navigation of the United States. United States Treasury Department, 1900.

Of the total quantity exported, the United Kingdom took 121,959,070 pounds, valued at $10,961,716. Germany, France, Italy, and the Netherlands, in the order named, were the next heaviest purchasers. Belgium and Spain were also important buyers of American tobacco, taking 17,146,300 and 13,772,478 pounds, respectively. Of the foreign countries in the Western Hemisphere, Canada and Mexico received the largest shipments, the former purchasing 10,303,395, and the latter 2,686,758 pounds. Of the 3,583,978 pounds exported to Asia, Japan received 3,104,472, or 86.6 per cent. Of the 3,766,885 pounds shipped to Oceania, British Australasia took all but 928. A total of 4,059,304 pounds were exported to Africa; of this amount British Africa received 2,630,760 pounds, or 64.8 per cent.

Table 4 is an accurate presentation of the quantity and value of the consignments of unmanufactured tobacco exported to the various countries of the world, but is not altogether reliable as an index to its final distribution and place of consumption. It is thought that practically all the tobacco exported to the United Kingdom is consumed within British possessions, but much of that exported to Germany is distributed from Bremen and other German ports to Austria-Hungary, Switzerland, Africa, and several other countries. The Regie system prevails in Italy, France, Spain, and Japan, and the quantity of American tobacco exported to those countries might be said to correspond exactly with its consumption. The quantity of pure leaf exported to the United Kingdom was 89,618,817 pounds in 1895; 79,063,780 pounds in 1896; 89,664,950 pounds in 1897; 88,366,290 pounds in 1898; and 85,395,232 pounds in 1899. The quantity exported to Germany was 51,311,070 pounds in 1895; 53,693,132 pounds in 1896; 64,304,001 pounds in 1897; 53,787,518 pounds in 1898; and 44,216,962 pounds in 1899. The quantity exported to France was 34,943,161 pounds in 1895; 33,792,243 pounds in 1896; 23,762,881 pounds in 1897; 22,016,203 pounds in 1898; and 23,656,171 pounds in 1899. The quantity exported to Italy was 24,542,652 pounds in 1895; 32,218,201 pounds in 1896; 27,472,628 pounds in 1897; 23,432,941 pounds in 1898; and 27,397,587 pounds in 1899. The quantity exported to the Netherlands was 17,765,213 pounds in 1895; 19,148,254 pounds in 1896; 26,489,855 pounds in 1897; 18,282,505 pounds in 1898; and 21,170,683 pounds in 1899.

In 1900, the imports of unmanufactured tobacco amounted to 19,619,627 pounds, valued at $13,297,223. Of the total quantity imported, 5,561,068 pounds were for cigar wrappers, of which 5,048,194 pounds, or 90.8 per cent, were grown by Dutch syndicates in the island of Sumatra and imported from the Netherlands. Of the 14,058,559 pounds imported, not suitable for cigar wrappers, 11,272,334 pounds, or 80.2 per cent, came from Cuba.

At the census of 1880 all phases of the tobacco industry, including both its cultivation and manufacture, received comprehensive treatment. The report of the industry at that census embraced statistics showing collectively the imports and the foreign and domestic exports of both manufactured and unmanufactured tobacco for the United States for each fiscal year from 1791 to 1880, inclusive. Table 5 of this report is intended to be supplementary to the import and export table of 1880, and shows the same items for each fiscal year from 1881 to 1900, inclusive.

TABLE 5.—MANUFACTURED AND UNMANUFACTURED TOBACCO: IMPORTS AND FOREIGN AND DOMESTIC EXPORTS, FISCAL YEARS 1881 TO 1900.

YEAR.	IMPORTS.					EXPORTS.			
	Unmanufactured.		Manufactured.			Unmanufactured.		Manufactured.	
			Cigars, cigarettes, and cheroots.		All other.			Cigars.	
	Pounds.	Value.	Pounds.	Value.	Value.	Pounds.	Value.	M.	Value.
1900	19,619,627	$13,297,223	460,559	$2,299,928	$64,214	344,655,697	$29,422,371	2,579	$74,623
1899	14,035,829	9,900,253	418,634	2,082,450	61,549	283,613,122	25,467,218	3,732	76,172
1898	10,477,108	7,488,608	331,902	1,551,009	52,497	263,020,214	22,171,580	1,557	37,381
1897	13,805,227	9,584,155	455,697	2,040,444	57,103	314,931,691	24,711,446	1,962	41,685
1896	32,924,966	16,503,130	500,945	2,141,364	59,448	295,539,312	24,571,362	1,247	30,113
1895	26,668,261	14,745,720	475,564	2,080,233	62,659	300,991,930	25,798,968	1,538	42,200
1894	19,663,259	10,935,336	463,923	2,083,934	70,202	290,684,992	24,087,934	2,062	51,263
1893	28,110,878	14,702,840	654,287	2,831,860	84,846	266,083,083	22,891,899	2,855	68,995
1892	21,988,535	10,332,423	658,169	2,832,047	94,004	255,432,077	20,670,045	3,017	83,544
1891	23,061,008	13,284,162	885,139	3,386,899	92,080	249,232,605	21,033,759	3,875	98,356
1890	28,720,674	17,605,192	1,250,217	4,026,328	78,434	255,647,026	21,479,556	3,482	97,703
1889	20,105,881	10,868,226	1,232,619	3,662,603	80,161	223,759,232	18,901,068	2,960	85,866
1888	18,600,142	10,870,841	1,153,468	3,404,956	101,993	262,682,821	21,936,084	2,176	49,686
1887	17,519,194	8,704,950	1,115,491	3,345,060	126,453	304,920,121	25,948,277	2,584	63,387
1886	15,695,670	7,830,007	1,016,033	3,289,471	92,610	292,773,890	27,158,457	1,887	43,726
1885	12,924,265	6,301,988	919,984	3,133,945	83,704	230,483,646	22,025,786	2,235	52,066
1884	12,955,017	5,962,163	891,769	3,189,225	87,134	207,157,687	17,765,760	3,110	82,306
1883	14,893,131	8,548,999	829,777	3,137,278	85,319	235,628,360	19,438,066	3,885	96,901
1882	11,899,823	6,230,865	802,872	3,032,038	84,859	223,665,980	19,067,721	4,217	113,717
1881	7,468,664	3,897,980	618,503	2,257,139	116,654	227,026,605	18,737,043	3,546	94,559

TABLE 5.—MANUFACTURED AND UNMANUFACTURED TOBACCO: IMPORTS AND FOREIGN AND DOMESTIC EXPORTS, FISCAL YEARS 1881 TO 1900—Continued.

YEAR.	EXPORTS—continued.			FOREIGN EXPORTS.				
	Manufactured—Continued.			Unmanufactured.		Manufactured.		
	Cigarettes.		Chewing, smoking, and snuff.			Cigars, cigarettes, and cheroots.		All other.
	M	Value.	Value.	Pounds.	Value.	Pounds.	Value.	Value.
1900	1,164,356	$2,290,876	$3,644,642	1,903,011	$1,016,683	11,510	$27,326	$5,078
1899	1,169,467	2,197,358	2,905,473	1,981,445	1,200,173	12,488	20,164	1,657
1898	1,105,905	2,018,616	2,762,496	2,363,522	1,447,330	20,631	28,016	460
1897	921,316	1,959,252	3,024,880	1,720,572	1,303,229	29,046	30,547	2,696
1896	633,785	1,408,823	2,941,425	3,702,271	2,698,041	15,104	19,297	6,723
1895	464,636	1,180,699	2,730,266	1,899,827	1,330,628	16,506	18,977	3,776
1894	408,551	1,094,340	2,704,393	1,961,751	959,284	13,306	17,090	5,023
1893	410,854	1,151,487	2,835,073	1,179,978	588,280	26,658	26,412	4,946
1892	306,545	1,018,427	2,967,409	1,143,878	432,756	20,145	29,663	7,850
1891	319,013	1,008,657	3,079,700	1,276,459	580,322	17,247	25,386	14,734
1890	265,001	830,817	2,947,525	1,797,377	891,787	16,613	22,216	9,177
1889	236,727	752,857	2,869,877	1,576,611	882,747	16,439	21,572	9,808
1888	195,713	626,166	2,902,605	1,578,290	906,565	16,717	25,287	13,456
1887	146,508	467,511	2,751,497	1,168,693	643,594	17,193	23,995	16,208
1886	127,946	412,664	2,810,061	1,294,498	666,635	28,646	36,511	23,671
1885	102,679	317,653	2,371,800	1,164,637	573,370	35,615	62,794	108,275
1884	79,032	248,890	2,199,261	823,504	316,243	40,052	62,134	41,234
1883	.....	.....	2,560,262	904,015	317,288	55,584	87,951	21,624
1882	.....	.....	2,249,431	786,930	327,596	71,295	113,287	20,090
1881	.....	.....	2,047,282	704,134	353,658	77,252	118,181	27,525

CIGARS AND CIGARETTES.

Table 6 is a comparative summary of the principal statistics of the manufacture of cigars and cigarettes for the censuses of 1860 to 1900, inclusive.

TABLE 6.—CIGARS AND CIGARETTES: COMPARATIVE SUMMARY, 1860 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.					PER CENT OF INCREASE.			
	1900	1890	1880	1870	1860	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870
Number of establishments	14,539	10,956	7,145	4,631	1,478	32.7	53.3	54.3	213.3
Capital	$67,706,493	$59,517,827	$21,698,549	$11,368,516	$3,035,555	13.8	174.3	90.9	274.5
Salaried officials, clerks, etc., number	4,470	[1]11,156	[2]	[2]	[2]	[3]59.9	.....	.....	.....
Salaries	$4,712,786	[1]$8,292,929	[2]	[2]	[2]	[3]43.2	.....	.....	.....
Wage-earners, average number	103,462	87,000	53,297	26,049	7,997	18.9	63.2	104.6	225.7
Total wages	$40,925,596	$36,475,060	$18,464,562	$9,098,709	$2,581,354	12.2	97.5	102.9	259.4
Men, 16 years and over	62,168	59,452	40,099	21,409	7,266	4.6	48.3	87.3	194.6
Wages	$29,963,405	$28,866,765	[2]	[2]	[2]	3.8	.....	.....	.....
Women, 16 years and over	37,762	24,214	9,108	2,615	731	56.0	165.9	248.3	257.7
Wages	$10,505,052	$7,174,765	[2]	[2]	[2]	46.4	.....	.....	.....
Children, under 16 years	3,532	3,334	4,090	2,025	[2]	5.9	[3]18.5	102.0	.....
Wages	$457,139	$433,530	[2]	[2]	[2]	5.4	.....	.....	.....
Miscellaneous expenses	$31,486,701	$17,673,063	[4]	[4]	[4]	77.9	.....	.....	.....
Cost of materials used	$57,946,020	$50,298,960	$29,577,833	$13,047,370	$8,611,312	15.2	70.1	126.7	271.6
Value of products	$160,223,152	$129,693,275	$63,979,575	$33,373,685	$9,068,778	23.5	102.7	91.7	268.0

[1] Includes proprietors and firm members with their salaries; number only reported in 1900, but not included in this table. (See Table 11.)
[2] Not reported separately.
[3] Decrease.
[4] Not reported.

Table 6 shows, for the four decades, a rapid growth in number of establishments, capital, wage-earners, wages, and value of products. The $13,763,638 increase in miscellaneous expenses from 1890 to 1900 is not disproportionate to the general expansion of the industry, as might appear, because the item includes internal-revenue tax, which was increased within the decade. The value of products shown by the table represents their value at the factory, packed or cased in marketable form ready for shipment, with the necessary revenue stamps affixed. The revenue tax is, therefore, a factor in the determination of such values, and its variation with different legislative acts should be considered in making comparisons. In the period covered by this report the tax was $3.60 a thousand on cigars and cigarettes weighing more than 3 pounds to the thousand; on cigars and cigarettes weighing not more than 3 pounds to the thousand the tax was $1 and $1.50 a thousand, respectively.

From Table 6 it appears that for the decade ending with 1900 there was an increase in all items except in number of salaried officials, superintendents, managers, clerks, and salesmen, and their salaries. These exceptions are chiefly due to differences in methods of classification at the censuses of 1890 and 1900 as explained in the letter of transmittal accompanying this report. The present tendency of manufacturing to centralize into single corporations has also resulted in lessening the number of persons employed in supervision and management.

Table 7 is a comparative summary of cigars and cigarettes, by states and territories, 1890 and 1900.

TABLE 7.—CIGARS AND CIGARETTES: COMPARATIVE SUMMARY,

	STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.	
					Number.	Salaries.
1	United States	1900	14,539	$67,706,493	4,470	$4,712,786
		1890	10,956	59,517,827	[1]11,156	[1]8,202,929
2	Alabama	1900	26	116,145	18	13,530
		1890	21	67,995	15	9,512
3	Arizona	1900	7	42,726	4	7,900
		1890	.....	.....	.....	.....
4	Arkansas	1900	19	20,241	1	600
		1890	8	20,699	9	6,136
5	California	1900	231	755,502	47	54,951
		1890	231	1,873,807	384	295,793
6	Colorado	1900	86	199,656	23	19,980
		1890	43	267,566	53	56,071
7	Connecticut	1900	216	863,591	26	28,955
		1890	159	578,859	127	93,317
8	Delaware	1900	25	77,229	1	624
		1890	23	41,087	19	11,070
9	District of Columbia	1900	42	50,618	.....	.....
		1890	70	114,782	72	42,730
10	Florida	1900	128	5,349,907	267	359,424
		1890	86	1,686,396	79	81,411
11	Georgia	1900	34	55,673	7	2,795
		1890	17	45,336	10	6,868
12	Idaho	1900	6	11,543	.....	.....
		1890	.....	.....	.....	.....
13	Illinois	1900	1,489	3,200,934	219	187,366
		1890	715	3,209,601	730	533,204
14	Indiana	1900	474	808,889	69	53,912
		1890	346	732,740	304	173,684
15	Iowa	1900	408	1,264,097	126	117,006
		1890	201	986,271	227	161,433
16	Kansas	1900	169	408,086	14	9,501
		1890	110	301,777	88	51,460
17	Kentucky	1900	180	1,105,303	81	67,677
		1890	144	528,297	159	94,500
18	Louisiana	1900	34	510,433	27	48,240
		1890	78	379,496	100	74,706
19	Maine	1900	54	134,076	10	5,630
		1890	25	80,330	21	12,081
20	Maryland	1900	382	1,519,866	155	105,809
		1890	385	1,396,602	379	226,550
21	Massachusetts	1900	331	2,358,501	133	153,576
		1890	338	1,786,599	352	208,312
22	Michigan	1900	600	1,957,635	207	196,321
		1890	373	1,516,952	408	269,577
23	Minnesota	1900	305	1,218,805	91	83,848
		1890	157	755,076	188	144,339
24	Missouri	1900	580	990,758	78	69,167
		1890	404	1,060,739	426	274,503
25	Montana	1900	30	68,594	.....	.....
		1890	6	16,689	4	2,194
26	Nebraska	1900	141	264,873	9	6,536
		1890	84	261,616	72	51,698
27	New Hampshire	1900	42	147,199	4	2,150
		1890	23	85,245	24	17,198
28	New Jersey	1900	486	1,311,122	38	30,574
		1890	444	1,055,558	382	232,142
29	New Mexico	1900	4	11,800	1	400
		1890	.....	.....	.....	.....
30	New York	1900	3,055	20,733,667	1,259	1,563,367
		1890	2,858	23,486,083	3,343	3,026,284
31	North Carolina	1900	16	169,980	22	16,830
		1890	17	1,073,390	28	20,680
32	North Dakota	1900	26	23,536	.....	.....
		1890	14	44,543	15	11,186

[1] Includes proprietors and firm members with their salaries; number only reported in 1900. (See Table 11.)

BY STATES AND TERRITORIES: 1890 AND 1900.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.								Miscellaneous expenses.	Cost of materials used.	Value of products.	
Total.		Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.					
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.	Average number.	Wages.				
103,462 87,000	$40,925,596 36,475,060	62,168 59,452	$29,963,405 28,866,765	37,762 24,214	$10,505,052 7,174,765	3,532 3,334	$457,139 433,530	$31,436,701 17,673,063	$57,946,020 50,298,960	$160,223,152 129,693,275	1
180 143	88,395 65,145	171 129	86,669 63,209	5 2	1,030 615	10 12	696 1,321	36,049 20,234	94,227 81,248	278,044 211,632	2
44	29,810	39	27,840	4	1,740	1	230	18,904	25,354	88,264	3
37 28	15,648 10,606	28 20	13,535 9,828	1	400	8 8	1,713 778	10,486 5,619	26,565 17,810	67,400 46,313	4
1,235 2,463	493,314 983,628	1,067 2,265	448,400 923,076	142 166	40,018 54,786	26 32	4,896 5,766	302,783 447,892	741,019 1,015,692	1,887,561 3,140,248	5
337 276	223,316 188,594	290 242	203,274 174,070	39 27	18,864 12,874	8 7	1,178 1,650	72,523 58,929	234,094 203,243	679,947 575,161	6
1,032 702	570,841 358,381	806 578	500,249 320,882	206 121	67,075 36,311	20 8	3,517 1,238	207,841 126,704	672,340 421,184	1,775,829 1,110,078	7
106 69	39,786 29,244	58 46	29,765 21,589	27 17	7,766 6,557	21 6	2,255 1,098	20,331 14,256	38,302 23,736	121,872 83,013	8
63 87	29,236 40,549	58 86	28,618 40,489	2	488	3 1	130 60	17,907 30,046	47,214 75,878	124,582 211,767	9
6,461 5,273	3,217,530 3,376,166	5,222 4,202	2,858,929 3,004,411	1,233 1,009	358,245 362,631	6 62	356 9,224	1,264,216 603,883	4,800,212 3,287,961	10,891,286 8,123,220	10
106 68	35,438 33,877	87 54	32,033 31,153	10 7	2,692 1,972	9 7	713 752	19,339 12,038	51,418 42,502	125,058 110,149	11
9	5,285	9	5,285					3,111	9,026	22,684	12
5,221 4,097	2,452,674 1,872,359	4,167 3,191	2,177,648 1,645,729	874 699	251,117 198,249	180 207	23,909 28,381	1,242,252 770,271	3,116,597 2,894,526	8,741,483 6,942,185	13
1,910 1,291	694,786 509,499	1,116 942	540,010 436,773	699 257	142,001 60,109	95 92	12,775 12,617	395,975 248,310	918,360 671,665	2,537,077 1,835,712	14
1,856 1,093	700,777 441,049	1,148 745	536,622 360,243	559 254	144,534 66,327	154 94	19,621 14,479	412,818 213,312	948,991 592,534	2,576,384 1,704,570	15
495 346	190,699 139,425	339 285	151,759 127,819	117 45	34,312 9,916	39 16	4,628 1,690	128,569 73,874	283,808 199,387	789,780 534,117	16
1,349 694	388,064 280,759	671 534	274,254 248,691	452 78	91,200 21,684	226 82	22,610 10,384	296,081 138,541	514,943 384,339	1,506,559 1,058,039	17
1,200 1,845	407,087 679,123	807 907	348,044 381,686	384 933	58,180 296,417	9 5	863 1,020	213,588 263,964	506,258 510,022	1,407,083 1,569,745	18
182 95	86,161 44,991	142 79	78,117 41,048	37 15	7,624 3,743	3 1	420 200	37,053 17,620	98,643 58,953	284,817 162,028	19
2,309 1,848	742,155 693,985	1,558 1,552	594,253 640,312	640 230	134,966 45,569	111 66	12,936 8,104	458,003 363,944	1,039,783 1,048,483	2,842,769 2,858,344	20
2,752 2,483	1,749,676 1,199,143	2,038 1,784	1,443,830 972,334	700 689	302,755 225,028	14 10	3,091 1,781	594,410 437,851	1,910,617 1,822,641	5,298,390 4,165,900	21
4,109 2,422	1,446,238 1,080,782	1,939 1,784	930,837 874,556	1,970 583	494,597 148,811	200 55	20,804 7,415	1,041,921 414,876	1,992,831 1,840,477	5,588,982 3,512,603	22
1,559 868	660,444 422,296	1,159 645	565,682 351,863	344 168	86,812 60,615	56 60	7,950 9,818	338,643 174,003	949,616 599,211	2,457,942 1,554,774	23
1,511 1,294	694,655 584,990	1,227 1,098	642,145 542,932	149 95	33,745 28,666	135 101	18,765 13,392	397,776 275,219	1,026,984 778,492	2,745,986 2,154,882	24
72 11	47,650 5,816	55 10	43,566 5,192	2 1	1,164 624	15	2,920	18,674 3,568	69,578 9,589	178,739 23,770	25
399 366	171,109 161,792	279 271	135,816 141,154	84 55	29,640 14,157	36 40	5,653 6,481	99,690 71,485	285,561 203,032	702,037 578,936	26
284 136	146,342 64,025	235 124	132,381 61,751	46 3	13,451 870	3 9	510 1,404	46,314 20,312	275,569 102,926	549,698 228,650	27
1,640 1,051	705,158 472,130	825 922	448,283 445,363	736 89	241,043 20,811	79 40	15,832 5,956	419,729 233,327	1,017,886 694,763	2,647,595 1,909,406	28
9	5,352	8	5,112	1	240			2,498	6,786	18,850	29
26,051 28,768	11,157,020 13,157,088	15,342 19,488	7,688,913 10,042,820	10,513 8,819	3,441,573 3,045,118	196 461	26,534 69,150	10,655,023 5,963,186	17,380,949 19,432,008	49,028,479 47,422,603	30
180 900	37,734 247,974	60 554	21,252 193,427	94 188	13,963 39,140	26 158	2,519 15,407	68,309 494,714	82,053 967,502	229,844 2,551,567	31
33 53	16,932 23,918	29 49	15,972 23,069	2 3	730 699	2 1	230 150	9,259 11,819	25,982 54,399	69,419 126,902	32

TABLE 7.—CIGARS AND CIGARETTES: COMPARATIVE SUMMARY,

	STATES AND TERRITORIES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.	
					Number.	Salaries.
33	Ohio	1900	1,129	$4,579,159	372	$363,170
		1890	937	2,729,275	893	543,754
34	Oklahoma	1900	17	21,338	.....	.....
		1890	.....	.....	.....	.....
35	Oregon	1900	38	58,655	1	1,200
		1890	12	56,045	12	10,088
36	Pennsylvania	1900	2,664	18,886,368	886	819,995
		1890	1,967	9,471,276	1,584	985,645
37	Rhode Island	1900	34	121,321	14	11,700
		1890	31	119,289	26	18,297
38	South Carolina	1900	6	12,510	1	900
		1890	7	9,630	6	2,853
39	South Dakota	1900	27	84,460	9	5,355
		1890	12	27,600	12	6,129
40	Tennessee	1900	35	90,547	5	4,360
		1890	25	90,953	24	17,643
41	Texas	1900	79	227,175	22	17,590
		1890	25	126,346	20	16,649
42	Utah	1900	15	46,128	.....	.....
		1890	6	62,883	2	1,616
43	Vermont	1900	21	42,941	2	1,728
		1890	14	62,298	14	12,320
44	Virginia	1900	89	780,261	126	196,092
		1890	102	1,809,416	169	180,350
45	Washington	1900	57	88,724	4	2,820
		1890	20	56,990	14	9,783
46	West Virginia	1900	72	351,017	23	15,602
		1890	55	172,889	45	30,482
47	Wisconsin	1900	622	1,597,914	68	75,569
		1890	355	1,301,856	316	207,155
48	Wyoming	1900	5	14,675	.....	.....
		1890	.....	.....	.....	.....
49	All other states[1]	1900	3	2,320	.....	.....
		1890	8	17,650	1	780

[1] 1900 includes establishments distributed as follows: Indian Territory, 1; Nevada, 2. 1890 includes establishments distributed as follows: Arizona, 1, Oklahoma, 1; Wyoming, 6.

BY STATES AND TERRITORIES: 1890 AND 1900—Continued.

AVERAGE NUMBER OF WAGE-EARNERS AND TOTAL WAGES.								Miscellaneous expenses.	Cost of materials used.	Value of products.	
Total.		Men, 16 years and over.		Women, 16 years and over.		Children, under 16 years.					
Average number.	Wages.	Average number.	Wages.	Average number.	Wages.	Average number.	Wages.				
9,046	$3,016,072	3,788	$1,642,778	5,156	$1,351,179	152	$22,115	$2,618,678	$3,717,825	$11,239,824	33
5,682	1,973,389	3,457	1,419,015	1,971	522,206	254	32,168	1,131,702	2,447,042	7,024,748	
35	12,700	25	10,708	5	1,490	5	502	7,101	22,382	50,838	34
71	32,961	60	31,175	7	955	4	831	19,312	60,019	146,401	35
44	21,695	40	20,945			4	750	12,071	31,797	92,460	
25,045	8,404,687	13,660	5,605,101	10,085	2,631,713	1,300	167,873	6,448,701	11,570,888	31,483,141	36
17,385	5,496,557	10,431	3,937,410	5,854	1,434,308	1,100	124,839	3,362,955	7,299,782	19,978,429	
159	65,515	97	47,463	62	18,052			37,466	92,054	292,872	37
179	71,576	80	41,067	95	29,951	4	558	31,927	97,834	254,586	
29	9,400	25	8,400	3	800	1	200	4,614	9,647	31,550	38
22	10,056	22	10,056					5,956	11,017	33,431	
129	59,894	115	57,512	9	1,482	5	900	26,976	68,924	197,155	39
47	17,786	44	17,475	2	182	1	129	7,673	23,570	66,458	
161	80,228	143	76,691	7	2,121	11	1,416	35,708	118,738	290,647	40
139	72,563	119	67,695	12	3,480	8	1,388	33,283	84,442	236,807	
303	133,353	212	116,035	59	12,894	32	4,424	70,666	203,206	525,959	41
149	79,735	129	76,110	6	1,542	14	2,083	29,976	85,858	241,970	
68	38,499	54	35,100	7	2,580	7	819	13,479	49,928	124,487	42
57	43,221	45	38,755	11	4,310	1	156	11,807	45,637	113,097	
52	26,226	47	25,136	4	974	1	116	11,869	30,700	86,223	43
64	37,300	56	35,419	8	1,881			11,751	40,488	117,717	
2,595	586,115	676	214,960	1,791	355,268	128	15,887	2,480,961	1,192,583	4,843,641	44
2,259	604,837	740	249,410	1,355	331,731	164	23,696	1,048,290	1,463,878	3,727,842	
133	68,855	117	64,757	9	2,646	7	1,452	38,936	126,910	293,839	45
77	54,158	70	52,502	1	180	6	1,476	20,585	67,096	178,410	
910	332,228	644	288,709	197	35,774	69	7,740	334,628	250,490	1,060,126	46
462	198,355	346	177,870	77	15,582	39	4,903	142,920	141,813	562,060	
1,969	799,281	1,561	719,512	289	65,159	119	14,610	436,842	1,224,417	3,255,676	47
1,651	661,717	1,280	582,888	274	67,263	97	11,616	308,868	962,202	2,524,949	
								4,463	12,128	31,788	48
16	8,370	16	8,370								
								1,226	3,620	9,600	49
4	1,905	4	1,905					3,552	12,351	34,002	
13	8,831	12	8,779			1	52				

The manufacture of cigars was widely distributed in 1900, every state except Mississippi being represented in the census returns for that year. Table 7 shows an increase in value of products from 1890 to 1900 for every state reporting three or more establishments except California, District of Columbia, Louisiana, Maryland, North Carolina, North Dakota, South Carolina, and Vermont. The cause for a decline in this industry in individual states, simultaneous with a substantial increase for the entire country, is not easy to explain. In addition to the vicissitudes common to local or neighborhood manufacturing, it is often due to the establishment of an improved factory system in the field of trade formerly occupied by the industry of a particular state, and in consequence, to the encroachments of competition; or it may be due to the policy of large corporations in withdrawing the manufacture of a particular form of product from one state to locate it in another whose position is more advantageous for lessening cost of production or securing control of markets. For example, a large factory producing both cigars and paper cigarettes may be absorbed by a corporation which withdraws from it the manufacture of cigars to other points, and continues in it only the manufacture of cigarettes. The products of one state are thus decreased while those of other states are increased correspondingly.

New York, Pennsylvania, Ohio, Florida, and Illinois, in the order named, were the leading 5 states in value of cigar and cigarette products in 1900. No cigarettes, however, were made in Ohio, and the value of products shown by the table for that state represents cigars exclusively. Only limited quantities of cigarettes were manufactured in Pennsylvania, Florida, and Illinois, but New York produced more than any other state. The combined cigar and cigarette manufactures of the greatest 5 producing states enumerated above were valued at $111,384,213, or 69.5 per cent of the total for the United States.

Of the capital invested in this branch of the industry, 5.8 per cent was in land, 9.2 per cent in buildings, 5.4 per cent in machinery, tools, and implements, and 79.6 per cent in cash and sundries. Of the miscellaneous expenses, 6.3 per cent was for rent of works, nine-tenths of 1 per cent for taxes, not including internal revenue, 92.7 per cent for rent of offices, insurance, interest, internal-revenue tax, repairs, advertising, and other sundries, and one-tenth of 1 per cent for contract work.

Table 8 shows the cost of materials used in the manufacture of cigars and cigarettes, 1900, with the per cent each class is of the total.

TABLE 8.—CIGARS AND CIGARETTES: COST OF MATERIALS, 1900.

	1900	
	Amount.	Per cent of total.
United States	$57,946,020	100.0
Purchased in raw state	49,290,657	85.0
Purchased in partially manufactured form [1]	7,923,140	13.7
Fuel	278,067	0.5
Rent of power and heat	37,986	0.1
Freight	416,170	0.7

[1] Includes "all other materials" and "mill supplies;" the latter is shown separately in Table 11.

Table 9 shows, by states and territories, the quantity of materials used and the number of each kind of cigars and cigarettes manufactured for the calendar year 1900.

TABLE 9.—CIGARS AND CIGARETTES: MATERIALS AND PRODUCTS, BY STATES AND TERRITORIES, CALENDAR YEAR 1900.

[Compiled from annual report of Commissioner of Internal Revenue, 1901.]

STATES AND TERRITORIES.	Tobacco used in both cigars and cigarettes (pounds).	Cigars and cigarettes manufactured (number).	CIGARS.				CIGARETTES.			
			Weighing more than three pounds per thousand.		Weighing not more than three pounds per thousand.		Weighing more than three pounds per thousand.		Weighing not more than three pounds per thousand.	
			Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.
United States	118,479,225	9,435,312,726	102,561,378	5,565,669,701	2,833,816	610,926,720	33,723	4,585,675	13,050,314	3,254,130,630
Alabama	112,724	7,370,589	112,724	7,370,589						
Alaska	4,848	272,325	4,848	272,325						
Arkansas	28,490	1,348,325	28,490	1,348,325						
Arizona	34,946	1,760,842	34,946	1,760,842						
California	1,317,603	92,706,625	1,266,763	61,099,445	260	84,300			50,580	31,522,880
Colorado	351,598	17,988,824	351,568	17,973,724					30	10,100
Connecticut	874,714	47,430,480	865,780	45,090,350	5,909	1,291,080			3,025	1,049,100
Delaware	128,542	6,253,924	126,476	5,839,784	2,066	414,140				
District of Columbia	57,949	3,309,445	57,949	3,309,445						
Florida	3,375,929	181,476,403	3,372,914	180,727,583	183	36,500			2,832	712,320
Georgia	76,611	4,364,394	75,235	3,814,544					1,376	549,850
Hawaii	4,002	77,700	4,002	77,700						
Idaho	19,981	971,730	19,981	971,730						
Illinois	5,471,599	293,992,878	5,431,435	279,623,468	7,364	1,776,800	900	72,490	31,910	12,520,120
Indiana	1,860,896	92,348,905	1,860,892	92,347,569	4	1,336				
Indian Territory	3,909	185,850	3,909	185,850						
Iowa	1,601,363	90,976,313	1,600,586	90,793,163	777	183,150				
Kansas	461,120	25,275,533	461,120	25,275,533						
Kentucky	1,168,866	60,157,660	1,168,204	59,952,660	125	25,000			537	180,000
Louisiana	948,820	104,343,191	785,757	55,787,771	1,514	305,620			161,549	48,249,800

TABLE 9.—CIGARS AND CIGARETTES: MATERIALS AND PRODUCTS, BY STATES AND TERRITORIES, CALENDAR YEAR 1900—Continued.

STATES AND TERRITORIES.	Tobacco used in both cigars and cigarettes (pounds).	Cigars and cigarettes manufactured (number).	CIGARS.				CIGARETTES.			
			Weighing more than three pounds per thousand.		Weighing not more than three pounds per thousand.		Weighing more than three pounds per thousand.		Weighing not more than three pounds per thousand.	
			Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.	Tobacco used (pounds).	Number.
Maine	155,647	7,438,421	155,647	7,438,421						
Maryland	8,937,700	404,972,476	2,640,391	144,173,346	1,293,118	259,375,280			4,191	1,423,850
Massachusetts	2,842,087	135,630,310	2,813,321	127,679,825	3,553	738,200	1,320	52,860	23,893	7,159,425
Michigan	4,650,583	222,944,099	4,650,451	222,896,799	132	47,300				
Minnesota	1,201,954	65,370,440	1,201,922	65,357,980	15	5,500			17	6,960
Mississippi	806	44,314	806	44,314						
Missouri	1,510,717	84,446,266	1,483,732	76,849,036	11,541	1,109,930			15,444	6,487,300
Montana	89,033	4,280,481	89,033	4,280,481						
Nebraska	394,670	21,804,549	394,670	21,804,549						
Nevada	10,886	537,150	10,886	537,150						
New Hampshire	218,028	9,755,871	218,028	9,755,871						
New Jersey	2,397,790	117,247,175	2,389,173	114,594,085	5,123	1,691,000			3,494	962,090
New Mexico	14,395	1,027,594	13,711	757,514					684	270,080
New York	29,257,778	3,037,727,670	21,395,481	1,117,729,748	743,889	173,543,802	31,248	4,337,325	7,087,160	1,742,116,795
North Carolina	2,371,295	666,635,684	306,464	17,370,874					2,064,831	649,314,810
North Dakota	38,942	2,076,200	38,942	2,076,200						
Ohio	10,711,890	658,819,883	10,653,512	644,831,993	58,378	13,987,890				
Oklahoma	43,687	2,176,894	43,687	2,176,894						
Oregon	90,631	4,338,455	90,631	4,338,455						
Pennsylvania	29,057,897	1,633,281,905	29,022,723	1,623,897,875	2,289	630,010	255	123,000	32,630	8,631,020
Rhode Island	165,576	9,203,886	165,537	9,191,886	39	12,000				
South Carolina	16,177	748,337	16,144	737,307	33	11,030				
South Dakota	112,874	6,427,326	112,874	6,427,326						
Tennessee	125,451	7,045,813	125,451	7,045,813						
Texas	299,692	14,845,943	299,535	14,814,343	2	500			155	31,100
Utah	57,028	2,775,623	57,028	2,775,623						
Vermont	53,209	2,674,253	53,209	2,674,253						
Virginia	7,174,662	1,077,102,550	2,911,187	178,515,818	697,500	155,653,702			3,565,975	742,933,030
Washington	140,032	8,964,526	140,032	8,964,526						
West Virginia	1,372,331	90,131,934	1,372,319	90,129,234	12	2,700				
Wisconsin	2,047,632	101,422,452	2,047,632	101,422,452						
Wyoming	13,635	807,310	13,635	807,310						

This table shows that the combined production of cigars and cigarettes for the year ending December 31, 1900, approximated nine and one-half thousand millions. More than one hundred and eighteen million pounds of tobacco were used in their manufacture, the average being 12.6 pounds of tobacco to each thousand cigars and cigarettes. In cigars alone, an average of 17.1 pounds of tobacco were used to each thousand, and in cigarettes an average of 4 pounds. Pennsylvania was the leading state in the separate manufacture of cigars, with a production of 1,624,527,885; New York, Ohio, Maryland, and Illinois followed in the order named, with 1,291,273,550; 658,819,883; 403,548,626; and 281,400,268, respectively. The combined product of these 5 states was 4,259,570,212, or 69 per cent of the entire output of the United States.

The records of the Bureau of Internal Revenue show that, for the year ending December 31, 1900, the leading 10 cities in cigar manufacture, in the order of their production, were New York, N. Y.; Cincinnati, Ohio; Philadelphia, Pa.; Pittsburg, Pa.; Richmond, Va.; Chicago, Ill.; Baltimore, Md.; Lancaster, Pa.; Tampa, Fla.; and Detroit, Mich. The output of the extremes (New York and Detroit) approximated 760,000,000 and 100,000,000 cigars, respectively.

The geographical distribution of cigarette manufacture is much more limited than the manufacture of cigars. Only 19 states are represented in Table 9, and the output of a majority of these was comparatively small. New York led, with an output of 1,746,454,120, followed by Virginia, North Carolina, Louisiana, and California, in the order named, with 742,933,030; 649,314,810; 48,249,800, and 31,522,880 cigarettes, respectively. The combined production of these 5 states was 3,218,474,640, or 98.8 per cent of the entire product of the United States.

The leading 10 cities in cigarette production for the calendar year, 1900, were New York, N. Y.; Richmond, Va.; Durham, N. C.; Rochester, N. Y.; New Orleans, La.; Lynchburg, Va.; San Francisco, Cal.; Wilson, N. C.; Chicago, Ill.; and Philadelphia, Pa. The production of the extremes (Greater New York and Philadelphia) approximated 1,370,000,000 and 9,000,000 cigarettes, respectively.

Table 10 shows the number of cigars and cigarettes withdrawn from factories for shipment and tax-paid, for each fiscal year from 1863 to 1900, inclusive.

TABLE 10.—CIGARS AND CIGARETTES: NUMBER WITHDRAWN FOR CONSUMPTION AND TAX-PAID, FOR EACH FISCAL YEAR FROM 1863 TO 1900, INCLUSIVE.

[Compiled from report of Commissioner of Internal Revenue, 1900.]

FISCAL YEAR ENDED JUNE 30—	Aggregate number.	Cigars.	Cigarettes.
1863[1]	[2]199,288,284	.....	.....
1864	[2]492,780,700	.....	.....
1865	713,001,099	693,230,989	19,770,110
1866	347,674,259	347,443,894	230,365
1867	[2]483,806,456	.....	.....
1868	[2]590,385,052	.....	.....
1869	993,287,429	991,535,934	1,751,495
1870	1,153,352,191	1,139,470,774	13,881,417
1871	1,332,844,357	1,313,913,604	18,930,753
1872	1,527,705,972	1,507,014,922	20,691,050
1873	1,807,034,646	1,779,946,596	27,088,050
1874	1,886,697,498	1,857,979,298	28,718,200
1875	1,967,959,663	1,926,661,780	41,297,883
1876	1,906,227,982	1,828,807,396	77,420,586
1877	1,949,078,518	1,800,009,256	149,069,257
1878	2,070,253,337	1,905,063,743	165,189,594
1879	2,257,523,581	2,019,246,764	238,276,817
1880	2,776,511,614	2,367,803,248	408,708,366
1881	3,250,016,780	2,682,620,797	567,395,983
1882	3,595,519,581	3,040,975,395	554,544,186
1883	3,867,910,645	3,227,888,992	640,021,653
1884	4,363,709,740	3,455,619,017	908,090,723
1885	4,417,721,871	3,358,972,633	1,058,749,238
1886	4,821,859,838	3,510,898,488	1,310,961,350
1887	5,372,810,643	3,788,305,443	1,584,505,200
1888	5,707,452,750	3,844,726,650	1,862,726,100
1889	6,018,901,000	3,867,385,640	2,151,515,360
1890	6,321,144,663	4,087,889,983	2,233,254,680
1891	7,159,431,527	4,474,892,767	2,684,538,760
1892	7,441,782,257	4,548,799,417	2,892,982,840
1893	7,990,895,817	4,814,197,117	3,176,698,700
1894	7,250,700,563	4,066,917,433	3,183,783,130
1895	7,492,450,117	4,163,972,440	3,328,477,677
1896	8,281,554,680	4,287,755,943	4,043,798,737
1897	8,216,421,567	4,063,169,097	4,153,252,470
1898	8,664,635,305	4,910,937,397	3,753,697,908
1899	7,882,418,561	5,077,287,824	2,805,130,737
1900	8,603,070,166	5,963,170,381	2,639,899,785

[1] From September 1, 1862.
[2] Including cigarettes not separately reported.

Tables 9 and 10 cover different years, neither of which agrees with the census year ending May 31, 1900. The correspondence is sufficiently close for approximations, but for absolute accuracy the differences should be considered. The number of cigars and cigarettes on which taxes were paid during the fiscal year ending June 30, 1900, shown by Table 10, falls considerably short of the number manufactured during the calendar year 1900, shown by Table 9. The discrepancy is explained by the difference in period of time covered by the two tables, and by the lack of correspondence between the number actually made and that withdrawn for consumption. Internal-revenue tax is not collected on cigars and cigarettes withdrawn for export, nor on those intended for domestic consumption, until withdrawn from the warehouses of the manufacturers. Products exported and those remaining in factory warehouses do not, therefore, appear in Table 10, but importations are included. The number of cigars and cigarettes tax-paid is doubtless a better index to consumption than is the number manufactured, but the annual average withdrawn for a period of years should be considered in computing annual consumption, because a marked increase or decrease in the number tax-paid from one year to another may be due to the policy of establishments in forcing manufactures and deliveries pending an increase in internal-revenue tax, or withholding them pending a reduction. The decrease in number of cigarettes since 1897, as shown by Table 10, is in part due to such policy and in part to the increasing consumption of cigarettes manufactured by the consumer from prepared tobacco put upon the market in packages accompanied by cigarette wrappers, which are given to the consumer in separate form. Cigarettes when so manufactured do not, of course, appear in statistical reports.

Table 4 shows, by countries, the imports of cigars, cigarettes, and cheroots, and the foreign exports of the same articles, for the fiscal year ending June 30, 1900, expressed in pounds and value. The number and value of domestic exports of cigars and cigarettes is also given by countries in this table, and Table 5 shows the same items for each fiscal year from 1880 to 1900, inclusive.

Table 11 is a detailed summary for cigar and cigarette manufacture, by states and territories, for the census year ending May 31, 1900.

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900.

	United States.	Alabama.	Arizona.	Arkansas.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.
Number of establishments	14,539	26	7	19	281	86	216	25	42
Character of organization:									
Individual	12,486	20	5	18	156	68	187	21	41
Firm and limited partnership	1,819	5	1	1	69	15	25	3	1
Incorporated company	229	1	1	.....	6	3	3	1	.....
Miscellaneous	5	.....	.....	.....	.....	.....	1	.....	.....
Capital:									
Total	$67,706,493	$116,145	$42,726	$20,241	$755,502	$199,656	$863,591	$77,229	$50,618
Land	$3,946,170	$4,005	$800	$3,315	$22,050	$27,550	$25,010	$3,100	$6,100
Buildings	$6,242,594	$6,775	$5,810	$2,920	$21,950	$27,400	$61,050	$3,575	$5,875
Machinery, tools, and implements	$3,635,106	$3,424	$1,411	$1,480	$47,443	$9,465	$29,494	$8,757	$2,885
Cash and sundries	$53,882,623	$101,941	$35,205	$12,526	$664,059	$135,241	$748,037	$61,797	$35,758
Proprietors and firm members	16,217	29	7	20	346	97	238	27	43
Salaried officials, clerks, etc.:									
Total number	4,470	18	4	1	47	23	26	1	.....
Total salaries	$4,712,786	$18,530	$7,900	$600	$54,954	$19,980	$28,955	$624	.....
Officers of corporations—									
Number	285	5	1	.....	3	5	4	.....	.....
Salaries	$521,931	$5,400	$2,400	.....	$7,500	$8,900	$6,300	.....	.....
General superintendents, managers, clerks, etc.—									
Total number	4,185	13	3	1	44	18	22	1	.....
Total salaries	$4,190,855	$8,130	$5,500	$600	$47,454	$16,080	$22,655	$624	.....
Men—									
Number	3,912	11	3	1	39	18	22	1	.....
Salaries	$4,070,231	$7,280	$5,500	$600	$45,554	$16,080	$22,655	$624	.....
Women—									
Number	273	2	.....	.....	5	.....	.....	.....	.....
Salaries	$120,624	$850	.....	.....	$1,900	.....	.....	.....	.....

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	United States.	Alabama.	Arizona.	Arkansas.	California.	Colorado.	Connecticut.	Delaware.	District of Columbia.
Wage-earners, including pieceworkers and total wages:									
Greatest number employed at any one time during the year	125,574	248	75	44	1,453	426	1,179	256	66
Least number employed at any one time during the year	92,438	140	36	31	1,135	322	948	99	61
Average number	103,462	186	44	37	1,235	337	1,032	106	63
Wages	$40,925,596	$88,395	$29,810	$15,648	$493,314	$228,316	$570,841	$39,786	$29,236
Men, 16 years and over—									
Number	62,168	171	39	28	1,067	290	806	58	58
Wages	$29,963,405	$86,669	$27,840	$13,585	$448,400	$203,274	$500,249	$29,765	$28,618
Women, 16 years and over—									
Number	37,762	5	4	1	142	39	206	27	2
Wages	$10,505,052	$1,080	$1,740	$400	$40,018	$18,864	$67,075	$7,766	$488
Children, under 16 years—									
Number	3,532	10	1	8	26	8	20	21	3
Wages	$457,139	$696	$230	$1,713	$4,896	$1,178	$3,517	$2,255	$130
Average number of wage-earners, including pieceworkers, employed during each month:									
Men, 16 years and over—									
January	61,547	185	40	28	1,124	294	778	60	58
February	62,072	200	42	28	1,124	323	793	66	58
March	63,409	185	43	27	1,092	322	801	66	58
April	64,060	177	49	27	1,094	324	797	61	60
May	65,039	167	65	27	1,052	331	812	55	60
June	61,543	153	28	26	1,012	279	812	56	60
July	58,691	146	29	26	964	241	793	55	58
August	59,401	149	29	23	1,009	247	814	53	58
September	60,756	160	31	26	1,035	252	817	58	59
October	62,450	168	33	30	1,101	289	823	58	58
November	63,468	183	37	31	1,100	287	828	58	58
December	63,580	177	37	32	1,098	291	806	57	56
Women, 16 years and over—									
January	36,540	8	5	1	153	39	188	21	2
February	36,950	8	5	1	156	40	209	33	2
March	37,548	8	5	1	147	47	210	33	2
April	37,855	8	5	1	148	48	212	38	2
May	38,637	8	5	1	142	48	211	38	2
June	37,946	8	2	1	126	39	211	53	2
July	36,550	2	2	1	125	29	192	23	2
August	37,032	2	3	1	128	29	213	23	2
September	37,951	2	3	1	139	28	212	17	2
October	38,757	2	3	1	149	40	215	17	2
November	38,682	2	5	1	147	40	211	17	2
December	38,696	2	5	1	149	41	189	17	2
Children, under 16 years—									
January	3,382	14	1	9	26	8	19	18	3
February	3,377	14	2	9	26	8	21	20	3
March	3,475	15	2	6	26	8	20	23	3
April	3,553	15	2	6	27	8	20	24	3
May	3,692	15	2	6	27	8	20	26	3
June	3,603	15	1	6	26	7	18	28	3
July	3,538	5	1	6	24	6	19	18	3
August	3,568	5	1	10	24	6	20	18	3
September	3,545	5	1	10	25	7	20	18	3
October	3,556	5	1	10	26	8	20	18	3
November	3,501	6	1	10	26	8	20	18	3
December	3,494	6	1	10	26	8	20	18	3
Miscellaneous expenses:									
Total	$31,486,701	$36,049	$18,904	$10,486	$302,783	$72,523	$207,841	$20,331	$17,907
Rent of works	$1,992,825	$7,130	$1,170	$1,213	$49,331	$11,716	$26,450	$4,392	$3,810
Taxes, not including internal revenue	$282,084	$1,087	$181	$437	$4,683	$1,814	$10,741	$301	$121
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$29,124,452	$27,832	$17,553	$8,826	$247,569	$57,558	$170,650	$15,638	$13,916
Contract work	$37,340	.....	.....	$10	$1,200	$1,435	.....	.....	$60
Materials used:									
Total cost	$57,946,020	$94,227	$25,354	$26,565	$741,019	$234,094	$672,340	$38,302	$47,214
Principal materials	$57,133,156	$92,620	$22,699	$25,883	$732,579	$229,217	$663,494	$37,548	$46,677
Purchased in raw state	$49,290,657	$83,357	$19,283	$22,866	$641,519	$200,333	$600,383	$32,648	$41,606
Purchased in partially manufactured form (including all other materials)	$7,842,499	$9,263	$3,416	$3,017	$91,060	$28,884	$63,111	$4,905	$5,071
Fuel	$278,067	$95	$10	$186	$520	$1,286	$4,433	$428	$203
Rent of power and heat	$37,986	.....	.....	.....	$810	$120	$177	$157	$10
Mill supplies	$80,641	.....	.....	.....	$10	.....	$861	.....	.....
Freight	$416,170	$1,512	$2,645	$496	$7,100	$3,471	$3,375	$169	$324
Products:									
Total value	$160,223,152	$278,044	$88,264	$67,400	$1,887,561	$679,947	$1,775,829	$121,872	$124,532
Comparison of products:									
Number of establishments reporting for both years	11,722	19	4	13	178	62	191	18	40
Value for census year	$137,854,376	$232,652	$19,323	$48,785	$1,578,856	$577,300	$1,722,350	$104,579	$122,232
Value for preceding business year	$124,703,947	$215,800	$18,392	$41,370	$1,451,996	$446,788	$1,592,876	$95,440	$118,001
Power:									
Number of establishments reporting	206	.....	.....	.....	1	.....	.....	2	.....
Total horsepower	4,791	.....	.....	.....	8	.....	.....	6	.....
Owned—									
Engines—									
Steam—									
Number	107	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	3,673	.....	.....	.....	.....	.....	.....	.....	.....
Gas or gasoline—									
Number	36	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	248	.....	.....	.....	.....	.....	.....	.....	.....
Water wheels—									
Number	1	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	1	.....	.....	.....	.....	.....	.....	.....	.....
Electric motors—									
Number	24	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	228	.....	.....	.....	.....	.....	.....	.....	.....
Other power—									
Number	.....	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....	.....
Rented—	646	.....	.....	.....	8	.....	.....	6	.....
Total horsepower	323	.....	.....	.....	.....	.....	.....	6	.....
Electric	323	.....	.....	.....	8	.....	.....	.....	.....
Other kind	27	.....	.....	.....	.....	.....	.....	.....	.....
Furnished to other establishments, horsepower									

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Florida.	Georgia.	Idaho.	Illinois.	Indiana.	Iowa.	Kansas.	Kentucky.
Number of establishments	128	34	6	1,489	474	408	169	180
Character of organization:								
Individual	67	27	5	1,315	417	317	147	148
Firm and limited partnership	46	5	1	155	55	79	22	26
Incorporated company	15	2	.....	19	2	12	.....	6
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....
Capital:								
Total	$5,349,907	$55,673	$11,543	$3,200,934	$808,889	$1,264,097	$408,086	$1,105,303
Land	$220,670	$6,170	$2,250	$320,296	$76,051	$52,160	$21,750	$77,950
Buildings	$410,885	$3,110	$1,775	$379,222	$100,555	$67,437	$60,045	$95,305
Machinery, tools, and implements	$96,214	$2,915	$490	$142,171	$35,966	$65,026	$26,373	$24,126
Cash and sundries	$4,622,138	$43,478	$7,028	$2,359,245	$596,317	$1,079,474	$299,918	$908,132
Proprietors and firm members	160	36	7	1,630	518	458	191	200
Salaried officials, clerks, etc.:								
Total number	267	7	.....	219	69	126	14	81
Total salaries	$359,424	$2,795	.....	$187,366	$53,942	$117,006	$9,504	$67,677
Officers of corporations—								
Number	23	2	.....	15	4	12	.....	11
Salaries	$75,413	$780	.....	$29,140	$6,600	$11,170	.....	$15,720
General superintendents, managers, clerks, etc.—								
Total number	244	5	.....	204	65	114	14	70
Total salaries	$284,011	$2,015	.....	$158,226	$47,342	$105,836	$9,504	$51,957
Men—								
Number	238	4	.....	187	60	105	14	64
Salaries	$281,447	$1,715	.....	$149,560	$45,477	$102,936	$9,504	$48,745
Women—								
Number	6	1	.....	17	5	9	.....	6
Salaries	$2,564	$300	.....	$8,666	$1,865	$2,900	.....	$3,212
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	8,988	148	13	6,768	2,246	2,258	598	1,724
Least number employed at any one time during the year	5,348	104	4	5,089	1,669	1,718	478	1,417
Average number	6,461	106	9	5,221	1,910	1,856	495	1,349
Wages	$3,217,530	$35,498	$5,285	$2,452,674	$694,786	$700,777	$190,699	$388,064
Men, 16 years and over—								
Number	5,222	87	9	4,167	1,116	1,143	339	671
Wages	$2,858,929	$32,033	$5,285	$2,177,648	$540,010	$536,622	$151,759	$274,251
Women, 16 years and over—								
Number	1,233	10	.....	874	699	559	117	452
Wages	$358,245	$2,692	.....	$251,117	$142,001	$144,534	$34,312	$91,200
Children, under 16 years—								
Number	6	9	.....	180	95	154	39	226
Wages	$356	$713	.....	$23,909	$12,775	$19,621	$4,628	$22,610
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	5,154	100	12	4,346	1,117	1,127	352	672
February	5,268	92	11	4,395	1,113	1,127	354	669
March	5,610	93	10	4,473	1,135	1,131	352	663
April	5,721	88	10	4,460	1,151	1,124	343	663
May	5,799	87	10	4,521	1,162	1,146	341	659
June	5,393	84	5	3,791	1,115	1,101	312	658
July	4,351	80	6	3,724	1,069	1,098	331	645
August	4,547	82	7	3,722	1,074	1,110	326	664
September	5,068	79	7	3,763	1,112	1,169	328	683
October	5,132	78	8	3,791	1,122	1,199	346	701
November	5,195	87	8	4,499	1,118	1,204	347	691
December	5,429	94	8	4,585	1,118	1,185	341	683
Women, 16 years and over—								
January	1,217	10	.....	965	548	541	125	447
February	1,235	11	.....	984	564	556	120	447
March	1,360	14	.....	992	585	571	119	447
April	1,437	14	.....	1,012	786	574	120	426
May	1,348	14	.....	985	788	573	118	425
June	1,287	9	.....	766	772	543	110	426
July	1,005	5	.....	702	573	539	112	464
August	1,075	5	.....	727	573	554	112	465
September	1,185	8	.....	734	799	560	112	466
October	1,225	9	.....	747	799	559	117	469
November	1,209	11	.....	935	800	568	123	470
December	1,258	11	.....	934	802	568	119	467
Children, under 16 years—								
January	6	8	.....	180	97	152	39	221
February	6	8	.....	178	97	150	39	224
March	6	10	.....	183	97	148	40	222
April	6	10	.....	183	97	153	41	224
May	6	10	.....	187	96	163	41	225
June	6	8	.....	185	97	144	37	231
July	6	8	.....	181	94	145	44	228
August	6	8	.....	182	93	148	42	228
September	6	8	.....	179	94	157	37	229
October	6	8	.....	175	94	159	37	229
November	6	8	.....	176	94	161	37	233
December	6	8	.....	172	94	163	35	224
Miscellaneous expenses:								
Total	$1,264,216	$19,839	$3,111	$1,242,252	$395,975	$412,818	$128,569	$290,081
Rent of works	$12,987	$3,833	$576	$173,842	$44,902	$52,843	$17,382	$20,004
Taxes, not including internal revenue	$17,941	$821	$169	$16,403	$6,640	$8,647	$2,992	$4,951
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$1,232,538	$15,185	$2,866	$1,047,743	$344,408	$351,178	$108,195	$271,126
Contract work	$750	.....	.....	$4,264	$25	$150	.....	.....
Materials used:								
Total cost	$4,800,212	$51,418	$9,026	$3,116,597	$918,360	$948,991	$283,808	$514,943
Principal materials	$4,757,371	$50,390	$8,470	$3,073,093	$901,747	$925,896	$275,275	$507,745
Purchased in raw state	$4,370,649	$44,851	$6,750	$2,676,531	$793,762	$805,644	$235,793	$437,761
Purchased in partially manufactured form (including all other materials)	$386,722	$5,539	$1,720	$396,562	$107,985	$120,252	$39,482	$69,984
Fuel	$445	$148	$98	$21,198	$6,513	$7,502	$2,484	$2,215
Rent of power and heat	$20	.....	.....	$3,698	$558	$1,189	$106	$366
Mill supplies	$230	.....	.....	$50	$180	$75	$630	$50
Freight	$42,146	$880	$458	$18,558	$9,362	$14,329	$5,313	$4,507

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Florida.	Georgia.	Idaho.	Illinois.	Indiana.	Iowa.	Kansas.	Kentucky.
Products:								
Total value	$10,891,286	$125,058	$22,684	$8,741,483	$2,537,077	$2,576,384	$789,780	$1,506,559
Comparison of products:								
Number of establishments reporting for both years	79	19	4	1,187	371	308	134	150
Value for census year	$8,599,409	$65,028	$16,300	$6,530,879	$2,265,397	$2,193,476	$605,397	$1,244,993
Value for preceding business year	$7,120,777	$60,211	$19,250	$5,902,269	$2,123,990	$1,948,294	$580,840	$1,277,091
Power:								
Number of establishments reporting				2	2	3	1	2
Total horsepower				14	35	9	18	27
Owned—								
Engines—								
Steam—								
Number					1			1
Horsepower					30			10
Gas or gasoline—								
Number							1	
Horsepower							18	
Water wheels—								
Number								
Horsepower								
Electric motors—								
Number								1
Horsepower								10
Other power—								
Number								
Horsepower								
Rented—								
Total horsepower				14	5	9		7
Electric				14	5	6		7
Other kind						3		
Furnished to other establishments, horsepower								

	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	Minnesota.	Missouri.	Montana.
Number of establishments	34	54	382	331	600	305	580	30
Character of organization:								
Individual	29	45	332	264	495	266	485	27
Firm and limited partnership	4	9	47	58	88	35	77	3
Incorporated company	1		3	8	17	4	18	
Miscellaneous				1				
Capital:								
Total	$510,433	$134,076	$1,519,866	$2,358,501	$1,957,635	$1,218,805	$990,758	$68,594
Land	$36,300	$2,450	$171,694	$122,970	$78,932	$98,955	$43,908	$6,450
Buildings	$79,175	$3,700	$238,010	$118,950	$119,587	$160,510	$96,595	$16,950
Machinery, tools, and implements	$39,716	$8,281	$76,413	$91,971	$86,978	$38,367	$47,944	$2,325
Cash and sundries	$355,242	$119,645	$1,033,749	$2,024,610	$1,672,138	$920,973	$802,311	$42,869
Proprietors and firm members	39	59	436	370	674	342	642	33
Salaried officials, clerks, etc.:								
Total number	27	10	155	133	207	91	78	
Total salaries	$48,240	$5,630	$105,809	$153,576	$196,321	$83,848	$59,167	
Officers of corporations—								
Number	1		5	9	22	5	22	
Salaries	$20,000		$5,824	$15,560	$30,215	$4,800	$19,636	
General superintendents, managers, clerks, etc.—								
Total number	26	10	150	124	185	86	56	
Total salaries	$28,240	$5,630	$99,985	$138,016	$166,106	$79,048	$39,531	
Men—								
Number	26	8	139	112	177	77	54	
Salaries	$28,240	$4,600	$95,472	$131,880	$162,974	$75,600	$38,931	
Women—								
Number		2	11	12	8	9	2	
Salaries		$1,030	$4,513	$6,136	$3,132	$3,448	$600	
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	1,268	245	2,636	3,362	4,817	1,784	1,847	93
Least number employed at any one time during the year	1,159	153	2,270	2,332	3,830	1,449	1,399	64
Average number	1,200	182	2,309	2,752	4,109	1,559	1,511	72
Wages	$407,087	$86,161	$742,155	$1,749,676	$1,446,238	$660,444	$694,655	$47,650
Men, 16 years of age and over—								
Number	807	142	1,558	2,038	1,939	1,159	1,227	55
Wages	$348,044	$78,117	$694,253	$1,443,880	$930,837	$565,682	$642,145	$43,566
Women, 16 years and over—								
Number	384	37	640	700	1,970	344	149	2
Wages	$58,180	$7,624	$134,966	$302,755	$494,597	$86,812	$38,745	$1,164
Children, under 16 years—								
Number	9	3	111	14	200	56	135	15
Wages	$863	$420	$12,936	$3,091	$20,804	$7,950	$18,765	$2,920
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	811	133	1,526	1,840	1,893	1,128	1,249	55
February	815	133	1,545	1,853	1,901	1,150	1,235	56
March	814	145	1,534	1,857	1,940	1,165	1,252	57
April	808	153	1,534	1,943	2,015	1,207	1,279	52
May	816	166	1,588	2,076	2,074	1,189	1,280	59
June	800	153	1,530	2,111	1,969	1,168	1,202	56
July	785	139	1,496	2,046	1,926	1,145	1,156	57
August	779	130	1,528	2,107	1,926	1,146	1,155	52
September	784	139	1,559	2,188	1,926	1,161	1,205	52
October	810	141	1,579	2,182	1,916	1,156	1,223	53
November	823	137	1,635	2,172	1,890	1,164	1,237	55
December	836	136	1,637	2,085	1,888	1,187	1,238	54
Women, 16 years and over—								
January	398	37	631	631	1,863	336	145	2
February	397	35	638	663	1,891	337	153	2
March	397	36	633	641	1,928	340	160	2
April	398	36	630	664	1,988	339	154	2

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	Minnesota.	Missouri.	Montana.
Average number of wage-earners, including piece-workers, employed during each month—Cont'd.								
Women, 16 years and over—Continued.								
May	371	38	671	704	2,045	348	150	2
June	371	37	634	711	2,049	342	146	2
July	363	38	632	728	2,002	348	144	2
August	363	36	637	723	1,994	348	145	2
September	363	37	637	723	1,987	349	142	2
October	396	38	633	748	1,989	349	156	2
November	397	40	650	729	1,964	349	144	2
December	397	39	651	731	1,955	345	147	2
Children, under 16 years—								
January	14	1	115	14	195	51	132	13
February	14	3	117	15	198	54	134	13
March	14	2	112	13	199	56	136	14
April	9	2	114	15	204	60	141	14
May	7	3	113	15	205	63	147	17
June	7	3	107	14	202	57	140	16
July	7	3	106	13	203	56	136	16
August	7	3	105	13	202	55	138	16
September	7	3	107	14	203	53	134	16
October	9	3	106	13	198	54	129	16
November	9	4	112	14	197	54	129	16
December	9	4	116	15	197	53	129	16
Miscellaneous expenses:								
Total	$213,588	$37,053	$458,003	$594,410	$1,041,921	$338,643	$397,776	$18,674
Rent of works	$11,364	$6,432	$50,199	$68,905	$66,045	$36,920	$61,422	$4,647
Taxes, not including internal revenue	$5,196	$711	$10,793	$12,500	$10,608	$4,636	$7,088	$792
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$196,948	$29,535	$397,011	$512,981	$957,054	$296,707	$328,494	$13,027
Contract work	$80	$375	.....	$24	$8,214	$380	$772	$208
Materials used:								
Total cost	$506,258	$98,643	$1,039,783	$1,910,617	$1,992,831	$949,616	$1,026,984	$69,578
Principal materials	$478,082	$96,400	$1,031,158	$1,887,078	$1,965,349	$928,252	$1,015,269	$66,036
Purchased in raw state	$402,539	$85,811	$886,781	$1,716,611	$1,733,821	$797,407	$902,978	$1,352
Purchased in partially manufactured form (including all other materials)	$75,543	$10,589	$144,377	$170,467	$231,528	$130,845	$112,291	$4,684
Fuel	$3,489	$932	$3,999	$11,625	$12,098	$6,611	$5,229	$273
Rent of power and heat	$55	$87	$422	$812	$1,333	$1,704	$272	$370
Mill supplies	$24,277	.....	$260	$125	$525	$15	$42	.....
Freight	$405	$1,224	$3,944	$10,977	$18,526	$13,034	$6,172	$2,899
Products:								
Total value	$1,407,083	$284,817	$2,842,769	$5,298,890	$5,588,982	$2,457,942	$2,745,986	$173,739
Comparison of products:								
Number of establishments reporting for both years	27	38	306	284	470	225	477	25
Value for census year	$274,933	$222,286	$2,421,396	$5,113,131	$4,891,121	$2,336,188	$2,424,323	$159,162
Value for preceding business year	$274,469	$199,590	$2,225,581	$4,710,847	$4,126,199	$1,851,358	$2,206,851	$128,870
Power—								
Number of establishments reporting	3	.....	4	6	4	3	2	.....
Total horsepower	306	.....	94	25	184	18	17	.....
Owned—								
Engines—								
Steam—								
Number	1	.....	1	4	.....	.....	1	.....
Horsepower	300	.....	35	22	.....	.....	15	.....
Gas or gasoline—								
Number	1	.....	1	.....	.....	1	.....	.....
Horsepower	4	.....	5	.....	.....	3	.....	.....
Water wheels—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Electric motors—								
Number	.....	.....	.....	.....	2	.....	.....	.....
Horsepower	.....	.....	.....	.....	32	.....	.....	.....
Other power—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Rented—								
Total horsepower	2	.....	54	3	102	15	2	.....
Electric	2	.....	.....	3	12	15	2	.....
Other kind	.....	.....	54	.....	90	.....	.....	.....
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	.....	.....	.....

	Nebraska.	New Hampshire.	New Jersey.	New Mexico.	New York.	North Carolina.	North Dakota.	Ohio.
Number of establishments	141	42	486	4	3,055	16	26	1,129
Character of organization:								
Individual	124	35	455	2	2,644	11	24	972
Firm and limited partnership	15	7	28	2	372	2	2	144
Incorporated company	2	.....	3	.....	38	3	.....	13
Miscellaneous	.....	.....	.....	.....	1	.....	.....	.....
Capital:								
Total	$264,873	$147,199	$1,311,122	$11,800	$20,733,667	$169,980	$23,536	$4,579,159
Land	$17,025	$4,275	$177,665	.....	$1,035,796	$24,740	$1,850	$184,358
Buildings	$20,250	$11,000	$220,165	.....	$1,374,625	$30,375	$3,575	$309,980
Machinery, tools, and implements	$9,515	$5,280	$70,213	$450	$1,227,535	$5,405	$1,613	$320,178
Cash and sundries	$217,483	$126,644	$843,079	$11,350	$17,095,711	$109,460	$18,498	$3,764,643
Proprietors and firm members	158	48	503	6	3,423	13	28	1,273
Salaried officials, clerks, etc.:								
Total number	9	4	38	1	1,259	22	.....	372
Total salaries	$6,536	$2,150	$30,574	$400	$1,563,367	$16,830	.....	$363,170
Officers of corporations—								
Number	2	.....	2	.....	51	2	.....	21
Salaries	$2,080	.....	$3,160	.....	$111,482	$1,200	.....	$26,679
General superintendents, managers, clerks, etc.—								
Total number	7	4	36	1	1,208	20	.....	351
Total salaries	$4,456	$2,150	$27,414	$400	$1,451,885	$15,630	.....	$336,491
Men—								
Number	6	4	30	1	1,136	20	.....	319
Salaries	$4,256	$2,150	$25,658	$400	$1,415,152	$15,630	.....	$323,566
Women—								
Number	1	.....	6	.....	72	.....	.....	32
Salaries	$200	.....	$1,756	.....	$36,733	.....	.....	$12,925

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Nebraska.	New Hampshire.	New Jersey.	New Mexico.	New York.	North Carolina.	North Dakota.	Ohio.
Wage-earners, including pieceworkers and total wages:								
Greatest number employed at any one time during the year	489	330	2,105	13	30,801	237	50	10,907
Least number employed at any one time during the year	358	236	1,421	8	22,206	163	32	8,134
Average number	399	284	1,640	9	26,051	180	33	9,046
Wages	$171,109	$146,342	$705,158	$5,352	$11,157,020	$37,734	$16,932	$3,016,072
Men, 16 years and over—								
Number	279	235	825	8	15,342	60	29	3,738
Wages	$135,816	$132,381	$448,283	$5,112	$7,688,913	$21,252	$15,972	$1,642,778
Women, 16 years and over—								
Number	84	46	736	1	10,513	94	2	5,156
Wages	$29,640	$13,451	$241,043	$240	$3,441,573	$13,963	$780	$1,351,179
Children, under 16 years—								
Number	36	8	79	.....	196	26	2	152
Wages	$5,653	$510	$15,832	.....	$26,534	$2,519	$230	$22,115
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	294	234	816	12	15,125	40	38	3,679
February	284	235	829	10	15,421	60	33	3,569
March	283	212	844	10	15,563	57	29	3,731
April	287	235	871	10	15,446	69	30	3,775
May	286	256	860	9	15,829	73	30	3,855
June	273	257	812	8	15,270	53	26	3,679
July	271	248	773	8	14,634	41	25	3,668
August	276	248	778	7	14,837	52	27	3,665
September	274	209	810	6	14,817	64	28	3,800
October	277	222	836	7	15,745	71	30	3,855
November	268	235	837	7	15,676	73	28	3,834
December	269	233	837	7	15,745	72	28	3,752
Women, 16 years and over—								
January	78	48	646	1	10,442	76	2	4,715
February	90	48	715	1	10,412	76	2	4,824
March	88	38	682	1	10,168	76	2	5,102
April	88	39	703	1	9,935	102	2	5,196
May	88	49	731	1	10,340	106	2	5,149
June	90	48	708	.....	10,653	96	2	5,079
July	75	48	711	.....	10,384	94	2	5,073
August	86	49	752	.....	10,574	94	2	5,160
September	88	40	759	.....	10,709	94	2	5,342
October	86	39	790	1	11,078	104	2	5,432
November	86	47	816	1	10,627	104	1	5,451
December	76	53	820	1	10,829	104	1	5,350
Children, under 16 years—								
January	33	2	72	.....	184	22	2	146
February	37	4	72	.....	182	22	2	145
March	37	4	75	.....	188	24	2	149
April	39	4	76	.....	197	29	3	147
May	38	4	78	.....	194	36	3	159
June	38	4	81	.....	195	27	2	156
July	30	4	79	.....	197	22	1	178
August	37	3	78	.....	202	22	1	173
September	37	2	76	.....	201	24	1	142
October	37	3	86	.....	208	27	1	144
November	36	3	88	.....	210	28	1	143
December	32	3	89	.....	200	28	1	137
Miscellaneous expenses:								
Total	$99,690	$46,314	$419,729	$2,498	$10,655,023	$68,309	$9,259	$2,613,678
Rent of works	$15,123	$5,684	$55,005	$728	$694,794	$986	$2,073	$142,744
Taxes, not including internal revenue	$1,708	$640	$7,166	$56	$59,729	$936	$255	$22,587
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$82,839	$39,990	$357,558	$1,714	$9,885,709	$66,387	$6,981	$2,447,769
Contract work	$25	.....	.....	.....	$14,791	.....	.....	$628
Materials used:								
Total cost	$285,561	$275,569	$1,017,886	$6,786	$17,380,949	$82,053	$25,982	$3,717,825
Principal materials	$276,324	$273,441	$1,005,468	$6,523	$17,165,135	$80,393	$24,590	$3,652,704
Purchased in raw state	$242,071	$261,776	$868,304	$5,750	$14,585,479	$62,434	$21,644	$3,128,382
Purchased in partially manufactured form (including all other materials)	$34,253	$11,665	$137,164	$773	$2,579,656	$17,959	$2,946	$524,322
Fuel	$2,811	$1,200	$6,891	.....	$77,823	$770	$610	$17,109
Rent of power and heat	$10	$152	$552	.....	$11,363	.....	$48	$3,677
Mill supplies	.....	.....	$146	.....	$47,184	$105	.....	$1,002
Freight	$6,416	$776	$4,829	$263	$79,444	$785	$784	$43,333
Products:								
Total value	$702,037	$549,698	$2,647,595	$18,850	$49,028,479	$229,844	$69,419	$11,239,824
Comparison of products:								
Number of establishments reporting for both years	111	38	423	2	2,582	10	16	903
Value for census year	$634,644	$523,560	$2,498,140	$14,250	$44,828,522	$99,005	$46,548	$9,459,032
Value for preceding business year	$581,402	$469,092	$2,106,026	$8,000	$41,618,055	$70,623	$44,610	$8,393,013
Power:								
Number of establishments reporting	.....	.....	6	.....	59	2	.....	20
Total horsepower	.....	.....	85	.....	1,685	115	.....	494
Owned—								
Engines—								
Steam—								
Number	.....	.....	3	.....	28	3	.....	9
Horsepower	.....	.....	79	.....	1,520	115	.....	290
Gas or gasoline—								
Number	.....	.....	.....	.....	11	.....	.....	6
Horsepower	.....	.....	.....	.....	64	.....	.....	42
Water wheels—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Electric motors—								
Number	.....	.....	.....	.....	.....	.....	.....	4
Horsepower	.....	.....	.....	.....	.....	.....	.....	45
Other power—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Rented—								
Total horsepower	.....	.....	6	.....	101	.....	.....	117
Electric	.....	.....	1	.....	43	.....	.....	87
Other kind	.....	.....	5	.....	58	.....	.....	30
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	5	.....	22

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Oklahoma.	Oregon.	Pennsylvania.	Rhode Island.	South Carolina.	South Dakota.	Tennessee.	Texas.
Number of establishments	17	38	2,664	34	6	27	35	79
Character of organization:								
Individual	15	30	2,371	31	6	22	29	56
Firm and limited partnership	2	8	271	2	.....	4	6	21
Incorporated company	.....	.....	22	1	.....	1	.....	2
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....
Capital:								
Total	$21,338	$58,655	$13,836,368	$121,321	$12,510	$84,460	$90,547	$227,175
Land	$2,925	$4,175	$818,457	$13,500	$1,500	$3,200	$3,250	$18,540
Buildings	$4,550	$4,875	$1,781,604	$19,700	$1,700	$5,200	$7,300	$16,575
Machinery, tools, and implements	$993	$4,659	$740,389	$11,745	$1,710	$4,135	$5,810	$11,660
Cash and sundries	$12,870	$44,946	$10,495,918	$76,376	$7,600	$71,925	$74,187	$180,400
Proprietors and firm members	19	46	2,928	35	6	30	40	94
Salaried officials, clerks, etc.:								
Total number	.....	1	886	14	1	9	5	22
Total salaries	.....	$1,200	$819,995	$11,700	$900	$5,355	$4,360	$17,590
Officers of corporations—								
Number	.....	.....	37	2	.....	3	.....	2
Salaries	.....	.....	$75,712	$3,000	.....	$2,500	.....	$1,800
General superintendents, managers, clerks, etc.—								
Total number	.....	1	849	12	1	6	5	20
Total salaries	.....	$1,200	$744,283	$8,700	$900	$2,855	$4,360	$15,790
Men—								
Number	.....	1	792	10	1	6	5	20
Salaries	.....	$1,200	$720,381	$7,950	$900	$2,855	$4,360	$15,790
Women—								
Number	.....	.....	57	2	.....	.....	.....	.....
Salaries	.....	.....	$23,902	$750	.....	.....	.....	.....
Wage-earners, including pieceworkers and total wages:								
Greatest number employed at any one time during the year	50	96	30,134	185	37	173	179	440
Least number employed at any one time during the year	33	68	22,793	133	23	107	157	297
Average number	35	71	25,045	159	29	129	161	303
Wages	$12,700	$32,961	$8,404,687	$65,515	$9,400	$59,894	$80,228	$133,353
Men, 16 years and over—								
Number	25	60	13,660	97	25	115	143	212
Wages	$10,708	$31,175	$5,605,101	$47,463	$8,400	$57,512	$76,691	$116,035
Women, 16 years and over—								
Number	5	7	10,085	62	3	9	7	59
Wages	$1,490	$955	$2,631,713	$18,052	$800	$1,482	$2,121	$12,894
Children, under 16 years—								
Number	5	4	1,300	.....	1	5	11	32
Wages	$502	$831	$167,873	.....	$200	$900	$1,416	$4,424
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	27	61	13,531	97	28	111	143	213
February	24	57	13,610	97	28	121	143	201
March	23	67	14,062	97	28	121	149	252
April	25	68	14,301	100	28	119	140	223
May	23	66	14,384	102	21	130	138	230
June	26	61	13,555	102	21	106	133	211
July	22	58	13,025	92	21	94	139	190
August	24	54	13,119	89	25	104	144	193
September	25	54	13,302	96	25	112	150	187
October	27	55	13,558	95	25	117	147	206
November	28	60	13,747	99	23	122	143	218
December	24	62	13,724	98	22	127	141	218
Women, 16 years and over—								
January	4	7	9,875	65	4	8	7	52
February	5	11	9,947	66	4	8	7	52
March	5	11	10,328	61	4	8	7	49
April	6	11	10,372	60	4	8	7	66
May	8	11	10,658	67	.....	13	7	70
June	4	11	10,234	63	.....	9	7	71
July	4	3	9,660	53	.....	9	7	63
August	4	4	9,784	44	.....	9	7	72
September	4	3	9,916	69	4	9	7	64
October	5	3	10,013	66	4	10	7	51
November	10	3	10,170	65	4	10	7	51
December	4	3	10,069	65	4	11	7	51
Children, under 16 years—								
January	4	3	1,230	.....	2	5	11	30
February	4	4	1,206	.....	2	5	11	30
March	5	5	1,278	.....	2	4	11	33
April	5	5	1,307	.....	2	4	11	33
May	5	4	1,371	.....	2	5	12	34
June	5	4	1,336	.....	2	5	12	32
July	5	4	1,298	.....	1	4	11	31
August	5	5	1,314	.....	1	4	11	31
September	5	4	1,320	.....	1	5	11	31
October	5	4	1,308	.....	1	5	11	32
November	5	4	1,333	.....	1	4	11	34
December	5	4	1,306	.....	1	4	11	34
Miscellaneous expenses:								
Total	$7,101	$19,312	$6,448,701	$37,466	$4,614	$26,976	$35,708	$70,666
Rent of works	$820	$6,006	$228,844	$3,658	$565	$4,188	$4,654	$7,117
Taxes, not including internal revenue	$184	$432	$34,963	$642	$242	$491	$552	$974
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$6,097	$12,874	$6,181,967	$33,166	$3,807	$22,352	$30,502	$62,575
Contract work	.....	.....	$2,927	.....	.....	.....	.....	.....
Materials used:								
Total cost	$22,382	$60,019	$11,570,888	$92,054	$9,647	$68,024	$118,738	$203,206
Principal materials	$21,848	$57,823	$11,424,240	$90,730	$9,297	$66,427	$115,951	$199,135
Purchased in raw state	$19,535	$49,835	$9,667,394	$81,097	$8,488	$58,752	$104,938	$176,718
Purchased in partially manufactured form (including all other materials)	$2,313	$7,988	$1,756,846	$9,633	$814	$7,675	$11,013	$22,417
Fuel	$124	$530	$58,548	$928	$75	$1,059	$244	$449
Rent of power and heat	.....	.....	$6,410	$14	.....	.....	.....	$10
Mill supplies	.....	.....	$3,876	$30	.....	.....	.....	.....
Freight	$410	$1,666	$77,814	$857	$275	$1,488	$2,543	$3,612
Products:								
Total value	$50,838	$146,401	$31,483,141	$292,872	$31,550	$197,155	$290,647	$525,959

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Oklahoma.	Oregon.	Pennsylvania.	Rhode Island.	South Carolina.	South Dakota.	Tennessee.	Texas.
Comparison of products:								
Number of establishments reporting for both years	11	33	2,139	29	6	16	28	52
Value for census year	$38,430	$133,354	$25,955,926	$141,136	$31,550	$132,610	$253,277	$416,571
Value for preceding business year	$32,300	$114,820	$23,392,422	$138,680	$28,800	$113,612	$222,980	$377,737
Power:								
Number of establishments reporting	.....	.....	66	1	.....	.....	.....	.....
Total horsepower	.....	.....	1,178	50	.....	.....	.....	.....
Owned—								
Engines—								
Steam—								
Number	.....	.....	46	1	.....	.....	.....	.....
Horsepower	.....	.....	857	50	.....	.....	.....	.....
Gas or gasoline—								
Number	.....	.....	14	.....	.....	.....	.....	.....
Horsepower	.....	.....	82	.....	.....	.....	.....	.....
Water wheel—								
Number	.....	.....	1	.....	.....	.....	.....	.....
Horsepower	.....	.....	1	.....	.....	.....	.....	.....
Electric motors—								
Number	.....	.....	13	.....	.....	.....	.....	.....
Horsepower	.....	.....	121	.....	.....	.....	.....	.....
Other power—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Rented—								
Total horsepower:								
Electric	.....	.....	117	.....	.....	.....	.....	.....
Other kind	.....	.....	117	.....	.....	.....	.....	.....
Furnished to other establishments, horsepower	.....	.....	.....	.....	.....	.....	.....	.....

	Utah.	Vermont.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states and territories.[1]
Number of establishments	15	21	89	57	72	622	5	3
Character of organization:								
Individual	10	19	69	47	63	542	4	3
Firm and limited partnership	3	2	11	8	7	71	1	.....
Incorporated company	2	.....	8	2	2	8	.....	.....
Miscellaneous	.....	.....	1	.....	.....	1	.....	.....
Capital:								
Total	$46,123	$42,941	$780,261	$88,724	$351,017	$1,597,914	$14,675	$2,320
Land	$2,000	$805	$25,330	$3,010	$39,360	$133,473	.....	$250
Buildings	$2,100	$1,325	$80,800	$7,475	$44,870	$207,144	.....	$150
Machinery, tools, and implements	$890	$2,560	$230,052	$6,275	$16,987	$66,512	$735	$170
Cash and sundries	$41,133	$38,251	$444,079	$71,964	$249,800	$1,190,785	$13,940	$1,750
Proprietors and firm members	17	23	95	60	81	680	6	3
Salaried officials, clerks, etc.:								
Total number	.....	2	126	4	23	68	.....	.....
Total salaries	.....	$1,728	$196,092	$2,820	$15,602	$75,569	.....	.....
Officers of corporations—								
Number	.....	.....	9	.....	.....	5	.....	.....
Salaries	.....	.....	$25,560	.....	.....	$8,400	.....	.....
General superintendents, managers, clerks, etc.—								
Total number	.....	2	117	4	23	63	.....	.....
Total salaries	.....	$1,728	$170,532	$2,820	$15,602	$67,169	.....	.....
Men—								
Number	.....	2	115	4	21	59	.....	.....
Salaries	.....	$1,728	$169,752	$2,820	$14,836	$65,473	.....	.....
Women—								
Number	.....	.....	2	.....	2	4	.....	.....
Salaries	.....	.....	$780	.....	$766	$1,696	.....	.....
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	83	65	3,103	172	1,115	2,243	20	5
Least number employed at any one time during the year	51	47	2,222	117	712	1,845	15	5
Average number	68	52	2,595	133	910	1,969	16	4
Wages	$38,499	$26,226	$586,115	$68,855	$332,223	$799,281	$8,370	$1,905
Men, 16 years and over—								
Number	54	47	676	117	644	1,561	16	4
Wages	$35,100	$25,136	$214,960	$64,757	$288,709	$719,512	$8,370	$1,905
Women, 16 years and over—								
Number	7	4	1,791	9	197	289	.....	.....
Wages	$2,580	$974	$355,268	$2,646	$35,774	$65,159	.....	.....
Children, under 16 years—								
Number	7	1	128	7	69	119	.....	.....
Wages	$819	$116	$15,887	$1,452	$7,740	$14,610	.....	.....
Average number of wage-earners, including pieceworkers, employed during each month:								
Men, 16 years and over—								
January	54	46	609	123	623	1,539	18	4
February	54	44	593	119	623	1,546	16	4
March	52	44	619	117	632	1,572	16	4
April	53	49	684	118	653	1,612	16	4
May	52	50	662	119	694	1,609	15	4
June	52	48	661	118	618	1,568	11	4
July	55	49	675	106	603	1,507	17	4
August	53	45	671	108	600	1,524	17	4
September	54	49	685	112	678	1,560	18	5
October	54	47	688	121	675	1,559	18	5
November	54	46	772	120	659	1,551	19	5
December	56	46	788	121	670	1,581	15	4
Women, 16 years and over—								
January	8	4	1,710	9	169	297	.....	.....
February	8	4	1,706	10	173	294	.....	.....
March	8	4	1,762	10	163	293	.....	.....
April	8	4	1,719	12	173	297	.....	.....
May	6	4	1,785	12	195	300	.....	.....
June	6	4	1,776	6	194	288	.....	.....
July	6	4	1,851	5	186	279	.....	.....
August	6	4	1,736	5	199	281	.....	.....

[1] Includes establishments distributed as follows: Indian Territory, 1; Nevada, 2.

TABLE 11.—CIGARS AND CIGARETTES: SUMMARY BY STATES AND TERRITORIES, 1900—Continued.

	Utah.	Vermont.	Virginia.	Washington.	West Virginia.	Wisconsin.	Wyoming.	All other states and territories.[1]
Average number of wage-earners, including piece-workers, employed during each month—Cont'd.								
Women, 16 years and over—Continued.								
September	6	4	1,818	8	219	283	.....	.....
October	7	4	1,868	9	228	285	.....	.....
November	9	4	1,868	11	234	287	.....	.....
December	9	4	1,894	10	232	287	.....	.....
Children, under 16 years—								
January	7	1	111	6	62	113	.....	.....
February	7	2	112	6	60	111	.....	.....
March	7	1	120	6	56	116	.....	.....
April	7	1	119	7	61	118	.....	.....
May	7	1	130	7	74	123	.....	.....
June	6	1	133	7	76	123	.....	.....
July	6	1	135	7	78	119	.....	.....
August	6	1	137	7	76	121	.....	.....
September	7	1	138	7	73	123	.....	.....
October	7	1	149	7	74	119	.....	.....
November	7	1	150	7	73	120	.....	.....
December	7	1	103	7	70	118	.....	.....
Miscellaneous expenses:								
Total	$13,479	$11,369	$2,480,961	$38,936	$334,628	$436,842	$4,463	$1,226
Rent of works	$2,758	$2,620	$12,507	$9,213	$11,550	$42,548	$760	$420
Taxes, not including internal revenue	$411	$315	$7,206	$508	$2,783	$8,943	$126	$37
Rent of office, insurance, interest, and all sundry expenses not hitherto included	$10,310	$8,434	$2,460,423	$29,215	$320,295	$385,154	$3,577	$769
Contract work	.....	.....	$825	.....	.....	$197	.....	.....
Materials used:								
Total cost	$49,928	$30,700	$1,192,583	$126,910	$250,490	$1,224,417	$12,123	$3,620
Principal materials	$47,892	$30,004	$1,182,705	$124,009	$244,188	$1,200,635	$11,876	$3,490
Purchased in raw state	$42,746	$27,314	$898,560	$111,109	$193,597	$1,063,164	$7,384	$3,100
Purchased in partially manufactured form (including all other materials)	$5,146	$2,690	$284,145	$12,840	$50,591	$137,471	$4,492	$390
Fuel	$224	$462	$3,530	$446	$506	$11,638	$50	$75
Rent of power and heat	.....	$20	$2,851	$30	$364	$219	.....	.....
Mill supplies	.....	.....	$748	.....	$10	$210	.....	.....
Freight	$1,812	$214	$2,749	$2,425	$5,422	$11,715	$197	$55
Products:								
Total value	$124,487	$86,223	$4,843,641	$293,839	$1,060,126	$3,255,676	$31,783	$9,600
Comparison of products:								
Number of establishments reporting for both years	10	16	60	48	52	505	1	2
Value for census year	$93,182	$69,368	$4,634,299	$250,315	$905,512	$2,914,853	$3,950	$6,900
Value for preceding business year	$75,584	$62,716	$4,415,626	$211,685	$841,060	$2,638,760	$3,300	$5,900
Power:								
Number of establishments reporting	.....	.....	7	.....	1	.....	.....	.....
Total horsepower	.....	.....	448	.....	25	.....	.....	.....
Owned—								
Engines—								
Steam—								
Number	.....	.....	8	.....	.....	.....	.....	.....
Horsepower	.....	.....	350	.....	.....	.....	.....	.....
Gas or gasoline—								
Number	.....	.....	.....	.....	1	.....	.....	.....
Horsepower	.....	.....	.....	.....	25	.....	.....	.....
Water wheels—								
Number	.....	.....	4	.....	.....	.....	.....	.....
Horsepower	.....	.....	20	.....	.....	.....	.....	.....
Electric motors:—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Other power—								
Number	.....	.....	.....	.....	.....	.....	.....	.....
Horsepower	.....	.....	.....	.....	.....	.....	.....	.....
Rented—								
Total horsepower	.....	.....	78	.....	.....	.....	.....	.....
Electric	.....	.....	3	.....	.....	.....	.....	.....
Other kind	.....	.....	75	.....	.....	.....	.....	.....
Furnished to other establisments, horse-power	.....	.....	.....	.....	.....	.....	.....	.....

[1] Includes establishments distributed as follows: Indian Territory, 1; Nevada, 2.

CHEWING AND SMOKING TOBACCO AND SNUFF.

Table 12 is a comparative summary for chewing and smoking tobacco and snuff, 1860 to 1900, inclusive.

TABLE 12.—CHEWING AND SMOKING TOBACCO AND SNUFF: COMPARATIVE SUMMARY, 1860 TO 1900, WITH PER CENT OF INCREASE FOR EACH DECADE.

	DATE OF CENSUS.					PER CENT OF INCREASE.			
	1900	1890	1880	1870	1860[1]	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870
Number of establishments	437	395	477	573	626	10.6	[2]17.2	[2]16.8	[2]8.5
Capital	$43,856,570	$30,841,316	$17,207,401	$13,555,814	$9,494,405	42.2	79.2	26.9	42.8
Salaried officials, clerks, etc., number	3,368	[3]1,477	(4)	(4)	(4)	128.0	.....	.....	.....
Salaries	$3,884,071	[3]$1,620,913	(4)	(4)	(4)	139.6	.....	.....	.....
Wage-earners, average number	29,161	29,790	32,756	21,799	18,859	[2]2.1	[2]9.1	50.3	15.6
Total wages	$7,109,821	$6,947,158	$6,419,024	$5,216,633	$3,571,294	2.3	8.2	23.0	46.1
Men, 16 years and over, number	14,124	14,942	14,886	10,588	15,869	[2]5.5	0.4	40.6	[2]33.3
Wages	$4,408,038	$4,582,822	(4)	(4)	(4)	[2]3.8	.....	.....	.....
Women, 16 years and over, number	11,590	10,564	10,776	5,179	2,990	9.7	[2]2.0	108.1	73.2
Wages	$2,388,920	$2,040,600	(4)	(4)	(4)	17.1	.....	.....	.....
Children, under 16 years, number	3,447	4,284	7,094	6,032	(4)	[2]19.5	[2]39.6	17.6	.....
Wages	$812,863	$323,736	(4)	(4)	(4)	[2]3.4	.....	.....	.....
Miscellaneous expenses	$47,533,705	$19,463,749	(5)	(5)	(5)	144.2	.....	.....	.....
Cost of materials used	$35,038,287	$29,192,249	$34,397,072	$21,609,237	$13,024,988	20.0	[2]15.1	59.2	65.9
Value of products	$103,754,362	$65,843,587	$52,793,056	$38,388,359	$21,820,535	57.6	24.7	37.5	75.9

[1] Classified as tobacco and snuff.
[2] Decrease.
[3] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 17.)
[4] Not reported separately.
[5] Not reported.

In the manufacture of chewing and smoking tobacco and snuff, capital increased $34,362,165, or 361.9 per cent, and value of products $81,933,827, or 375.5 per cent in the forty-year period ending with 1900. The rise and fall in number of establishments shown by Table 12 is due to differences in the thoroughness of the canvass of small factories at different censuses, and also to different methods of grouping and classifying establishments by character of products. This item is influenced, too, by the concentration of the industry into large corporations and by the special taxes levied by internal-revenue laws on manufacturers of the different classes of products. The increase of $28,069,956 in miscellaneous expenses between 1890 and 1900 is not disproportionate to the general growth of the industry, as would first appear, because the item includes internal-revenue tax, which was increased by the act which took effect June 13, 1898. From March 3, 1883, to October 1, 1890, the revenue tax on tobacco and snuff was 8 cents a pound, and from October 1, 1890, to June 13, 1898, it was 6 cents; during the time covered by this report it was 12 cents.

Table 13 is a comparative summary for chewing and smoking tobacco and snuff, by states and territories, 1890 and 1900.

TABLE 13.—CHEWING AND SMOKING TOBACCO AND SNUFF: COMPARATIVE SUMMARY, BY STATES AND TERRITORIES, 1890 AND 1900.

	Year.	United States.	California.	Georgia.	Illinois.	Indiana.	Kentucky.	Louisiana.	Maryland.	Michigan.	Minnesota.	Missouri.
Number of establishments	1900	437	.....	.....	30	11	59	3	5	8	3	22
	1890	395	3	6	15	.....	38	5	6	5	4	26
Capital	1900	$43,856,570	.....	.....	$908,481	$17,190	$3,485,793	$314,875	$1,805,611	$894,400	$5,895	$7,020,479
	1890	$30,841,316	$19,410	$13,507	$941,620	.....	$2,687,471	$115,238	$2,208,619	$1,586,460	$41,100	$4,533,925
Salaried officials, clerks, etc., number.	1900	3,368	.....	.....	87	4	493	34	120	156	1	742
	1890	[1]1,477	4	3	56	.....	148	16	43	62	13	267
Salaries	1900	$3,884,071	.....	.....	$127,728	$1,500	$524,758	$45,225	$259,624	$202,689	$600	$741,291
	1890	[1]$1,020,913	$4,660	$990	$74,258	.....	$148,576	$11,845	$38,966	$89,472	$5,304	$401,073
Wage-earners, average number	1900	29,161	.....	.....	671	28	3,187	284	2,002	1,173	3	3,720
	1890	29,790	26	40	592	.....	2,479	155	1,178	1,290	10	3,117
Total wages	1900	$7,109,821	.....	.....	$217,034	$8,490	$850,018	$71,620	$564,272	$322,817	$1,484	$1,402,549
	1890	$6,947,158	$10,036	$2,210	$200,442	.....	$659,906	$46,606	$335,135	$318,953	$5,450	$1,117,610
Men, 16 years and over	1900	14,124	.....	.....	174	20	2,202	81	684	474	2	1,887
	1890	14,942	13	15	156	.....	1,772	109	248	508	10	1,460
Wages	1900	$4,408,038	.....	.....	$88,730	$7,150	$670,054	$34,357	$243,979	$189,647	$1,218	$841,414
	1890	$4,582,822	$5,526	$1,367	$92,289	.....	$546,282	$40,512	$110,166	$180,287	$5,450	$657,743
Women, 16 years and over	1900	11,590	.....	.....	425	6	567	186	1,232	698	1	1,747
	1890	10,564	13	15	400	.....	414	41	824	755	.....	1,507
Wages	1900	$2,388,920	.....	.....	$116,454	$1,140	$137,549	$35,228	$298,489	$132,962	$216	$539,671
	1890	$2,040,600	$4,510	$490	$105,972	.....	$89,849	$5,150	$213,617	$135,876	.....	$452,057
Children, under 16 years	1900	3,447	.....	.....	72	2	418	17	186	1	.....	86
	1890	4,284	.....	10	36	.....	293	5	106	27	.....	150
Wages	1900	$312,863	.....	.....	$11,850	$200	$42,415	$2,035	$21,804	$208	.....	$21,464
	1890	$323,736	.....	$363	$2,190	.....	$23,775	$944	$11,352	$2,790	.....	$7,810
Miscellaneous expenses	1900	$47,533,705	.....	.....	$1,549,724	$23,054	$7,182,022	$460,888	$3,233,312	$1,935,032	$1,447	$12,511,008
	1890	$19,463,749	$10,514	$3,302	$727,485	.....	$2,320,144	$32,871	$928,023	$1,309,858	$11,286	$4,456,979
Cost of materials used	1900	$35,038,287	.....	.....	$1,072,500	$16,078	$5,221,257	$421,508	$2,496,107	$1,174,039	$1,527	$8,255,857
	1890	$29,192,249	$61,352	$4,303	$727,314	.....	$2,847,081	$128,728	$1,534,205	$2,383,082	$22,948	$8,030,780
Value of products	1900	$103,754,302	.....	.....	$3,167,552	$58,230	$14,948,192	$1,083,524	$7,054,159	$3,746,045	$13,700	$25,101,446
	1890	$65,843,587	$90,905	$13,938	$2,027,153	.....	$6,788,586	$282,080	$3,216,247	$4,742,412	$54,085	$15,428,764

	Year.	New Jersey.	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	West Virginia.	Wisconsin.	All other states and territories.
Number of establishments	1900	12	42	80	19	20	35	69	4	6	[2]9
	1890	4	30	90	20	11	24	98	.....	4	[3]11
Capital	1900	$6,692,041	$1,757,687	$6,874,908	$2,081,858	$1,765,539	$1,318,414	$5,728,357	$2,253,775	$717,732	$218,535
	1890	$811,113	$2,671,274	$3,370,267	$2,105,848	$1,347,228	$358,932	$6,840,276	.....	$683,774	$1,010,254
Salaried officials, clerks, etc., number.	1900	204	137	469	162	35	106	509	50	30	29
	1890	20	119	163	70	48	36	316	.....	19	74
Salaries	1900	$197,814	$188,629	$577,048	$242,606	$40,065	$108,241	$486,135	$49,118	$53,420	$87,580
	1890	$18,591	$146,536	$117,602	$97,380	$51,023	$19,658	$301,234	.....	$30,845	$62,900
Wage-earners, average number	1900	1,955	1,020	6,403	1,087	257	615	6,061	318	300	77
	1890	131	1,531	6,002	1,870	282	531	9,769	.....	245	542
Total wages	1900	$527,195	$345,704	$869,170	$389,881	$102,395	$152,043	$1,082,226	$79,765	$103,958	$19,250
	1890	$46,690	$574,009	$843,105	$549,110	$104,217	$77,766	$1,841,151	.....	$95,124	$119,638
Men, 16 years and over	1900	797	446	2,962	657	107	348	3,119	66	170	28
	1890	84	717	2,606	1,034	110	245	5,551	.....	168	186
Wages	1900	$311,899	$218,673	$492,803	$268,323	$58,208	$106,394	$756,569	$27,901	$78,779	$12,000
	1890	$37,072	$336,949	$553,363	$393,599	$48,067	$55,245	$1,370,975	.....	$79,474	$68,465
Women, 16 years and over	1900	1,054	564	1,949	430	148	193	1,987	252	102	49
	1890	34	711	1,505	807	172	147	2,764	.....	65	390
Wages	1900	$194,660	$125,333	$272,373	$121,558	$43,918	$37,508	$251,650	$51,864	$21,098	$7,250
	1890	$7,668	$219,492	$167,096	$152,135	$56,150	$16,479	$350,228	.....	$14,090	$49,741
Children, under 16 years	1900	104	10	1,492	.....	2	74	955	.....	28	.....
	1890	18	103	1,891	29	.....	139	1,454	.....	12	16
Wages	1900	$20,636	$1,698	$108,995	.....	$269	$8,201	$74,007	.....	$4,081	.....
	1890	$1,950	$17,568	$122,646	$3,376	.....	$6,042	$119,948	.....	$1,560	$1,492
Miscellaneous expenses	1900	$2,713,031	$2,032,836	$6,192,103	$3,001,133	$451,243	$557,149	$4,069,746	$659,763	$845,656	$114,558
	1890	$134,322	$1,006,457	$1,411,623	$1,936,909	$372,956	$152,849	$3,337,634	.....	$523,567	$786,970
Cost of materials used	1900	$2,424,108	$1,734,072	$4,230,049	$1,917,219	$423,245	$516,369	$4,082,291	$477,253	$472,735	$99,073
	1890	$111,095	$1,610,642	$1,867,400	$2,925,371	$507,282	$212,268	$4,825,432	.....	$353,896	$1,039,060
Value of products	1900	$7,788,379	$4,692,101	$13,620,816	$5,752,853	$1,247,897	$1,541,475	$10,707,766	$1,362,978	$1,632,354	$295,395
	1890	$848,814	$4,431,373	$4,783,484	$5,991,177	$1,355,121	$577,690	$11,804,813	.....	$1,212,668	$2,694,277

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 17.)
[2] Includes establishments distributed as follows: Alabama, 1; California, 1; Colorado, 2; Iowa, 2; Massachusetts, 1; Nebraska, 2.
[3] Includes establishments distributed as follows: Alabama, 1; Arizona, 1; Delaware, 1; Indiana, 1; Iowa, 1; Kansas, 1; Massachusetts, 2; Texas, 1; West Virginia, 2.

This branch of the industry was less widely distributed than the manufacture of cigars and cigarettes. Only 23 states were represented in 1900; the returns from 6 of these were not separately tabulated, because they included fewer than 3 establishments each. Missouri, Kentucky, North Carolina, Virginia, and New Jersey, in the order named, were the leading 5 states in value of products, their combined output being valued at $72,166,599, or 69.6 per cent of the total. Michigan, Minnesota, Ohio, Pennsylvania, and Virginia showed a decrease in value of products from 1890 to 1900, due to practically the same causes observed as producing a decrease in value of products for individual states in cigar and cigarette manufacture. Among the leading producers, New Jersey showed the greatest percentage of increase for the decade in both capital and value of products, this being due to the policy of a large corporation in concentrating the manufacture of certain forms of tobacco at Jersey City.

Of the capital invested in this branch of the industry in 1900, land constituted 4.4 per cent of the total reported; buildings, 14.5 per cent; machinery, tools, and implements, 13.9 per cent; and cash on hand and sundries, 67.2 per cent. Of miscellaneous expenses, rent of offices, insurance, interest, internal-revenue tax and stamps, repairs, advertising, and other sundries constituted 99.1 per cent.

Table 14 shows the cost of materials and the per cent each class is of the total for 1900.

TABLE 14.—CHEWING AND SMOKING TOBACCO AND SNUFF: COST OF MATERIALS, 1900.

	1900	
	Amount.	Per cent of total.
Total	$35,038,287	100.0
Purchased in raw state	23,628,161	67.4
Purchased in partially manufactured form [1]	10,838,320	30.9
Fuel	368,652	1.1
Rent of power and heat	8,466	[2]
Freight	194,188	0.6

[1] Includes "all other materials" and "mill supplies;" the latter is shown separately in Table 17.
[2] Less than one-tenth of 1 per cent.

Table 15 is a summary for chewing and smoking tobacco and snuff, by states and territories, of the kinds and quantity of materials and products for the calendar year 1900, as compiled from the reports of the Commissioner of Internal Revenue.

TABLE 15.—CHEWING AND SMOKING TOBACCO AND SNUFF: MATERIALS AND PRODUCTS, KINDS AND QUANTITY, BY STATES AND TERRITORIES, CALENDAR YEAR 1900.

[From report of Commissioner of Internal Revenue, 1901.]

MATERIALS.

STATES AND TERRITORIES.	Total.	Leaf tobacco.	Scraps.	Stems.	Licorice.	Sugar.	Other materials.	In process.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
United States	360,911,538	231,151,242	22,667,692	6,864,724	36,799,147	27,431,007	18,959,471	17,038,255
Alabama	255,196	221,295	547	8,310	711			24,333
Arkansas	1,307		1,307					
California	249,521	171,747	27,127		4,132	4,542	12,101	29,872
Colorado	46,660		46,660					
Connecticut	28,649	1,517	26,972	160				
Florida	17,975	210	17,765					
Georgia	12,102	5,112	4,586				1,729	725
Illinois	12,741,167	7,476,765	2,335,261	422,946	567,995	1,119,685	574,242	244,273
Indiana	348,275	184,351	117,101		1,939	1,563	1,391	41,430
Iowa	550,695	277,993	154,353	70,279	4,678	23,602	726	19,064
Kansas	49,324	5,790	39,869				200	3,465
Kentucky	40,919,547	26,613,850	194,079	28,599	6,463,194	4,521,745	2,670,739	427,341
Louisiana	2,168,230	1,912,458	24,506		82,313	62,896	79,524	6,533
Maryland	20,623,476	11,467,154	1,770,124	1,462,216	194,618	422,773	433,200	4,873,391
Massachusetts	234,000	121,613	18,038	2,262			11,284	80,803
Michigan	8,013,981	4,323,914	1,288,505	29,526	673,515	970,177	481,122	247,222
Minnesota	115,259	9,794	99,777	8,145			793	1,750
Missouri	38,822,770	49,556,663	1,990,318	1,353,469	16,795,957	9,645,780	4,046,520	434,063
Montana	13,371		13,371					
Nebraska	58,964		58,964					
New Hampshire	2,453		2,453					
New Jersey	32,550,483	16,020,131	2,455,393	1,384,003	2,837,817	2,598,537	2,181,515	5,123,087
New Mexico	22,550	19,846	2,278					426
New York	18,542,114	12,720,607	2,466,123	531,212	1,220,967	727,959	613,660	261,586
North Carolina	53,646,967	46,982,357	359,378	16	2,164,362	1,273,935	869,294	1,997,625
Ohio	22,301,334	8,601,394	5,077,733	264,913	3,216,882	3,937,846	1,065,600	136,966
Oregon	10,812		10,512				300	
Pennsylvania	8,245,559	4,338,077	539,987	40,499	95,360	64,542	2,527,449	639,645
South Carolina	6,810	2,699	2,469		150	144	2	1,346
Tennessee	8,380,880	6,088,483	56,678	308,246	130,154	111,486	755,015	930,818
Texas	50,608	1,118	47,952		47		99	1,392
Virginia	35,482,909	28,520,949	357,180	73,511	1,931,906	1,552,837	1,636,338	1,410,188
West Virginia	4,753,857	572,134	2,931,009	2,009	282,358	197,767	763,969	4,616
Wisconsin	6,643,783	4,933,221	129,367	929,403	130,097	193,191	232,159	96,295

TABLE 15.—CHEWING AND SMOKING TOBACCO AND SNUFF: MATERIALS AND PRODUCTS, KINDS AND QUANTITY, BY STATES AND TERRITORIES, CALENDAR YEAR 1900—Continued.

PRODUCTS.

STATES AND TERRITORIES.	Total.	Plug.	Fine cut.	Smoking.	Snuff.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
United States	300,707,189	173,890,614	11,462,797	101,548,467	13,805,311
Alabama	199,529	1,171	.....	502	197,856
Arkansas	1,307	.....	.....	1,307	.....
California	205,257	30,781	.....	174,476	.....
Colorado	46,660	.....	.....	46,660	.....
Connecticut	28,343	.....	.....	28,343	.....
Florida	17,975	.....	.....	17,975	.....
Georgia	10,704	.....	.....	10,704	.....
Illinois	12,061,744	687,481	2,361,729	8,304,719	707,815
Indiana	263,410	134,579	.....	127,326	1,505
Iowa	513,573	.....	25,620	487,646	307
Kansas	44,869	2,818	.....	42,051	.....
Kentucky	37,354,177	35,474,301	187,582	1,575,482	116,812
Louisiana	2,060,464	.....	.....	2,031,525	28,939
Maryland	12,348,971	.....	.....	10,399,748	1,949,223
Massachusetts	132,072	.....	.....	19,268	112,804
Michigan	7,194,916	1,402,825	1,406,061	4,346,144	39,886
Minnesota	123,626	.....	.....	96,100	27,526
Missouri	78,487,505	72,423,982	78,015	5,975,549	14,959
Montana	13,371	.....	.....	13,371	.....
Nebraska	58,964	.....	.....	58,964	.....
New Hampshire	2,453	.....	.....	2,453	.....
New Jersey	22,480,204	6,058,400	4,313,623	7,925,608	4,182,573
New Mexico	18,304	.....	.....	18,304	.....
New York	17,258,841	1,400,568	2,404,036	13,366,138	88,099
North Carolina	41,433,436	24,144,270	.....	17,239,357	49,809
Ohio	19,818,539	9,716,945	85,606	10,015,453	535
Oregon	10,742	.....	.....	10,512	230
Pennsylvania	6,685,554	50	94,529	3,352,434	3,238,541
South Carolina	5,578	2,025	.....	3,553	.....
Tennessee	4,502,679	1,597,313	.....	512,439	2,392,927
Texas	47,658	.....	.....	47,658	.....
Virginia	26,907,856	20,810,152	7,875	5,449,754	640,075
West Virginia	4,145,082	50	.....	4,135,454	9,528
Wisconsin	6,222,876	2,903	503,121	5,711,490	5,362

According to this table the greatest 5 producers were Missouri, North Carolina, Kentucky, Virginia, and New Jersey, in the order named. These states together produced 206,663,178 pounds, or 68.7 per cent of the total output of the United States. They do not quite correspond in relative position with the 5 states which are first in value of products, because of the difference in form and value of their manufactures.

St. Louis, Mo.; Louisville, Ky.; Winston, N. C.; Richmond, Va.; Middletown, Ohio; Jersey City, N. J.; Martinsville, Va.; Petersburg, Va.; Danville, Va.; and Detroit, Mich., were the leading 10 cities in the manufacture of plug chewing tobacco in 1900, arranged according to the magnitude of their production.

In the manufacture of fine-cut chewing tobacco, Jersey City, N. J.; Chicago, Ill.; Detroit, Mich.; New York, N. Y.; Rochester, N. Y.; Milwaukee, Wis.; Covington, Ky.; Caldwell, N. J.; Utica, N. Y.; and Albany, N. Y., were the leading 10 cities.

Durham, N. C.; Baltimore, Md.; New York, N. Y.; Cincinnati, Ohio; Chicago, Ill.; Jersey City, N. J.; St. Louis, Mo.; Milwaukee, Wis.; Richmond, Va.; and Detroit, Mich., were the greatest 10 producers of smoking tobacco.

The leading 10 cities in the manufacture of snuff were Philadelphia, Pa.; Helmetta, N. J.; Baltimore, Md.; Nashville, Tenn.; Jersey City, N. J.; Clarksville, Tenn.; Chicago, Ill.; Lynchburg, Va.; Pittsburg, Pa.; and Spotswood, N. J.

Table 16 shows the aggregate quantity of chewing and smoking tobacco and snuff withdrawn from the warehouses of manufacturers and importers for domestic consumption for each fiscal year from 1863 to 1900, inclusive, as shown by the report of the Commissioner of Internal Revenue, 1900.

TABLE 16.—AGGREGATE QUANTITY OF CHEWING AND SMOKING TOBACCO AND SNUFF WITHDRAWN FOR CONSUMPTION AND TAX-PAID, FOR EACH FISCAL YEAR FROM 1863 TO 1900, INCLUSIVE.

[Compiled from report of Commissioner of Internal Revenue, 1900.]

FISCAL YEAR ENDING JUNE 30—	Aggregate quantity for each fiscal year.	FISCAL YEAR ENDING JUNE 30—	Aggregate quantity for each fiscal year.
	Pounds.		*Pounds.*
1863[1]	23,852,387	1882	161,324,661
1864	64,577,097	1883	170,361,558
1865	37,641,822	1884	174,196,064
1866	37,493,785	1885	180,777,413
1867	47,631,494	1886	191,592,240
1868	46,764,150	1887	206,499,521
1869	64,305,026	1888	209,362,602
1870	90,288,082	1889	221,524,869
1871	95,135,504	1890	238,290,158
1872	95,209,319	1891	253,896,042
1873	114,789,208	1892	265,126,372
1874	107,747,091	1893	264,312,643
1875	119,435,874	1894	247,078,897
1876	110,380,602	1895	259,101,112
1877	116,146,103	1896	266,215,736
1878	108,824,843	1897	274,003,452
1879	120,398,458	1898	303,385,747
1880	136,275,834	1899	251,759,816
1881	147,013,405	1900	293,894,453

[1] From September 1, 1862.

It will be seen that the quantity produced, as shown by Table 15, does not correspond with the last item of Table 16. The same reasons assigned for a similar discrepancy shown in cigars and cigarettes apply to chewing and smoking tobacco and snuff.

Table 17 is a detailed summary for this branch of the industry, by states and territories, for the census year 1900.

TABLE 17.—CHEWING AND SMOKING TOBACCO AND SNUFF: BY STATES AND TERRITORIES, 1900.

	United States.	Illinois.	Indiana.	Kentucky.	Louisiana.	Maryland.	Michigan.	Minnesota.	Missouri.	New Jersey.
Number of establishments	437	30	11	59	3	5	8	3	22	12
Character of organization:										
Individual	197	19	6	37	1	1	3	3	11	1
Firm and limited partnership	124	4	3	19	.....	2	.....	.....	3	3
Incorporated company	116	7	2	23	2	2	5	.....	8	8
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Capital:										
Total	$43,856,570	$908,481	$17,190	$3,485,793	$314,875	$1,805,611	$894,400	$5,895	$7,020,479	$6,692,041
Land	$1,917,427	$26,250	$1,365	$86,938	$11,000	$107,034	$49,611	.....	$307,050	$485,947
Buildings	$6,359,788	$56,500	$4,150	$580,984	$30,500	$356,333	$192,295	.....	$1,568,905	$1,433,059
Machinery, tools, and implements	$6,119,777	$123,804	$2,145	$726,253	$57,847	$536,371	$152,400	$195	$956,199	$1,028,406
Cash and sundries	$29,459,628	$701,927	$9,530	$2,091,618	$215,528	$805,873	$500,088	$5,700	$4,188,325	$3,744,629
Proprietors and firm members	456	28	13	58	1	8	3	3	17	6
Salaried officials, clerks, etc.:										
Total number	3,368	87	4	493	34	120	156	1	742	204
Total salaries	$3,884,071	$127,728	$1,500	$524,758	$45,225	$259,624	$202,689	$600	$741,291	$197,814
Officers of corporations—										
Number	214	6	4	41	3	3	14	.....	22	10
Salaries	$552,012	$17,080	$1,500	$99,536	$14,250	$15,500	$49,756	.....	$74,951	$27,900
General superintendents, managers, clerks, etc.—										
Total number	3,154	81	.....	452	31	117	142	1	720	194
Total salaries	$3,332,059	$110,648	.....	$425,222	$30,975	$244,124	$152,933	$600	$666,340	$169,914
Men—										
Number	3,026	79	.....	427	28	113	138	1	681	187
Salaries	$3,283,658	$108,932	.....	$413,748	$30,264	$242,380	$151,433	$600	$654,837	$167,014
Women—										
Number	128	2	.....	25	3	4	4	.....	39	7
Salaries	$48,401	$1,716	.....	$11,474	$711	$1,744	$1,500	.....	$11,503	$2,900
Wage-earners, including pieceworkers, and total wages:										
Greatest number employed at any one time during the year	39,646	759	45	4,382	332	2,635	1,456	4	5,525	2,611
Least number employed at any one time during the year	24,939	651	26	2,338	207	1,503	1,073	4	2,470	1,871
Average number	29,161	671	28	3,187	284	2,002	1,173	3	3,720	1,955
Wages	$7,109,821	$217,084	$8,490	$850,018	$71,620	$564,272	$322,817	$1,434	$1,402,549	$527,195
Men, 16 years and over—										
Average number	14,124	174	20	2,202	81	584	474	2	1,887	797
Wages	$4,408,038	$88,730	$7,150	$670,054	$34,357	$243,979	$189,047	$1,218	$841,414	$311,809
Women, 16 years and over—										
Average number	11,590	425	6	567	186	1,232	698	1	1,747	1,054
Wages	$2,388,920	$116,464	$1,140	$137,549	$35,228	$298,489	$132,962	$216	$539,671	$194,660
Children, under 16 years—										
Average number	3,447	72	2	418	17	186	1	.....	86	104
Wages	$312,863	$11,850	$200	$42,415	$2,035	$21,804	$208	.....	$21,464	$20,636
Average number of wage-earners, including pieceworkers, employed during each month:										
Men, 16 years and over—										
January	12,064	177	26	2,030	88	606	487	2	1,740	699
February	13,628	183	28	2,735	88	600	563	2	1,781	765
March	14,748	180	23	2,545	83	607	588	2	2,237	918
April	15,241	179	20	2,054	88	609	552	2	2,168	1,024
May	16,047	170	19	2,439	83	590	536	2	2,097	946
June	15,014	162	18	2,389	81	533	155	3	1,872	818
July	13,906	157	17	2,019	78	539	498	2	1,083	754
August	14,849	159	18	2,033	80	573	496	2	2,037	757
September	14,448	162	17	1,945	75	569	481	2	1,968	749
October	14,172	187	21	2,128	68	588	470	2	1,955	736
November	13,272	187	21	2,134	83	600	470	2	1,857	707
December	12,099	181	18	1,971	80	598	393	2	1,848	694
Women, 16 years and over—										
January	10,056	415	5	491	183	1,122	707	1	1,524	862
February	10,985	428	5	627	181	1,060	760	1	1,856	1,056
March	12,029	433	9	610	193	1,363	776	1	1,912	1,266
April	12,331	431	9	591	200	1,321	787	1	1,924	1,114
May	12,647	412	5	633	213	1,388	777	1	1,802	1,082
June	11,781	406	5	592	214	1,108	288	1	1,857	1,123
July	11,868	396	5	543	173	1,323	749	1	1,358	1,152
August	12,084	402	5	555	201	1,184	757	1	1,658	1,198
September	11,865	410	5	537	156	1,185	745	1	1,656	1,046
October	11,827	457	5	542	147	1,418	722	1	1,802	921
November	11,065	462	5	534	189	1,245	680	1	1,758	962
December	10,542	448	5	550	187	1,067	624	1	1,862	860
Children, under 16 years—										
January	2,583	76	3	361	20	163	1	.....	56	95
February	2,834	76	3	453	20	181	1	.....	57	109
March	3,152	72	2	446	20	194	1	.....	88	112
April	3,518	73	2	486	15	205	1	.....	64	104
May	3,924	72	2	467	18	198	1	.....	78	91
June	4,145	72	2	478	18	206	1	.....	60	106
July	4,053	66	1	418	15	174	1	.....	52	112
August	4,079	66	1	430	15	167	1	.....	63	111
September	3,852	66	1	360	10	165	1	.....	81	111
October	3,520	77	1	403	10	194	1	.....	114	101
November	3,504	76	2	388	23	213	1	.....	140	103
December	2,600	76	2	377	20	172	1	.....	176	95
Miscellaneous expenses:										
Total	$47,533,705	$1,549,724	$23,054	$7,182,022	$460,888	$3,233,312	$1,935,032	$1,447	$12,511,008	$2,713,031
Rent of works	$161,358	$19,571	$584	$15,956	$1,616	$2,836	$10,080	$313	$7,544	$2,100
Taxes, not including internal revenue	$275,819	$5,554	$194	$22,556	$4,276	$18,629	$18,808	$17	$45,091	$17,839
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$47,088,948	$1,524,569	$22,326	$7,143,510	$454,996	$3,216,847	$1,906,144	$1,117	$12,458,373	$2,692,842
Contract work	$7,580	$30	.....	.....	.....	.....	.....	.....	.....	$250
Materials used:										
Total cost	$35,038,287	$1,072,500	$16,078	$5,221,257	$421,508	$2,496,107	$1,174,039	$4,527	$8,255,857	$2,424,108
Principal materials	$34,324,752	$1,058,686	$15,589	$5,152,956	$417,545	$2,479,293	$1,107,538	$4,302	$8,161,118	$2,349,445
Purchased in raw state	$23,628,161	$602,733	$13,757	$3,631,022	$289,986	$1,528,932	$558,741	$1,770	$5,384,161	$1,595,944
Purchased in partially manufactured form (including "all other materials")	$10,696,591	$455,953	$1,832	$1,521,934	$127,579	$950,361	$548,797	$2,532	$2,776,957	$753,501
Fuel	$368,652	$10,413	$168	$41,142	$1,686	$10,475	$41,375	$60	$55,363	$38,649
Rent of power and heat	$8,466	$364	$25	$110	.....	$649	.....	$60	$1,567	$420
Mill supplies	$142,229	$1,164	$25	$22,334	$2,277	$5,690	$12,461	$20	$18,664	$29,293
Freight	$194,188	$1,873	$271	$4,715	.....	.....	$12,665	$85	$19,145	$6,301

TABLE 17.—CHEWING AND SMOKING TOBACCO AND SNUFF: BY STATES AND TERRITORIES, 1900—Continued.

	United States.	Illinois.	Indiana.	Kentucky.	Louisiana.	Maryland.	Michigan.	Minnesota.	Missouri.	New Jersey.
Products:										
Total value	$103,754,362	$3,167,552	$58,280	$14,948,192	$1,083,524	$7,054,159	$3,746,045	$13,700	$25,101,446	$7,788,379
Comparison of products:										
Number of establishments reporting for both years	308	23	7	31	.....	3	6	3	16	9
Value for census year	$54,760,450	$2,405,924	$37,877	$3,666,452	.....	$5,716,496	$1,257,985	$13,700	$3,245,287	$7,171,416
Value for preceding business year	$44,458,109	$1,965,790	$33,650	$2,484,074	.....	$4,764,226	$918,188	$11,100	$2,198,622	$6,736,762
Power:										
Number of establishments reporting	259	14	2	35	2	5	6	1	13	12
Total horsepower	20,088	497	25	1,919	110	1,398	1,001	5	3,925	2,128
Owned—										
Engines—										
Steam—										
Number	319	14	2	47	2	8	10	.....	31	22
Horsepower	16,777	477	25	1,812	110	1,204	751	.....	2,547	1,849
Gas or gasoline—										
Number	8	2	.....	.....	.....	1	.....	.....	.....	.....
Horsepower	95	9	.....	.....	.....	13	.....	.....	.....	.....
Water wheels—										
Number	14	.....	.....	.....	.....	.....	.....	.....	.....	9
Horsepower	437	.....	.....	.....	.....	.....	.....	.....	.....	272
Electric motors—										
Number	226	.....	.....	3	.....	43	10	.....	120	.....
Horsepower	2,350	.....	.....	100	.....	180	250	.....	1,257	.....
Other power—										
Number	7	.....	.....	.....	.....	.....	.....	.....	1	.....
Horsepower	215	.....	.....	.....	.....	.....	.....	.....	100	.....
Rented—										
Total horsepower	209	11	.....	7	.....	1	.....	5	21	7
Electric	88	.....	.....	.....	.....	1	.....	.....	21	7
Other kind	121	11	.....	7	.....	.....	.....	5	.....	.....
Furnished to other establishments, horsepower	635	20	.....	60	.....	.....	.....	.....	425	.....

	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Number of establishments	42	80	19	20	35	69	4	6	9
Character of organization:									
Individuals	24	39	10	15	17	24	1	3	2
Firms and limited partnership	9	31	4	3	7	29	1	2	4
Incorporated company	9	10	5	2	11	16	2	1	3
Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....	.....
Capital:									
Total	$1,757,687	$6,874,908	$2,081,858	$1,765,539	$1,318,414	$5,728,357	$2,253,775	$717,782	$213,535
Land	$116,550	$238,291	$34,421	$181,097	$79,148	$137,225	$52,500	.....	$3,000
Buildings	$160,883	$640,067	$181,660	$345,063	$198,829	$502,960	$102,550	.....	$5,000
Machinery, tools, and implements	$250,019	$648,158	$350,316	$223,357	$167,702	$762,027	$49,937	$71,060	$13,575
Cash and sundries	$1,230,235	$5,348,392	$1,515,461	$1,016,022	$872,735	$4,326,145	$2,048,788	$646,672	$191,960
Proprietors and firm members	38	100	18	26	32	85	3	7	10
Salaried officials, clerks, etc.:									
Total number	137	469	162	35	106	509	50	30	29
Total salaries	$188,629	$577,048	$242,606	$40,065	$108,241	$486,135	$49,118	$53,420	$37,580
Officers of corporations—									
Number	15	25	11	3	15	29	5	3	5
Salaries	$37,033	$51,140	$42,300	$5,080	$16,895	$67,221	$18,220	$9,000	$4,700
General superintendents, managers, clerks, etc.—									
Total number	122	444	151	32	91	480	45	27	24
Total salaries	$151,596	$525,908	$200,306	$35,035	$91,346	$418,914	$30,898	$44,420	$32,880
Men—									
Number	116	436	144	31	90	471	35	26	23
Salaries	$147,820	$523,324	$197,547	$34,635	$90,996	$415,499	$28,329	$43,820	$32,480
Women—									
Number	6	8	7	1	1	9	10	1	1
Salaries	$3,776	$2,584	$2,759	$400	$350	$3,415	$2,569	$600	$400
Wage-earners, including pieceworkers, and total wages:									
Greatest number employed at any one time during the year	1,352	8,593	1,485	418	934	8,358	368	308	81
Least number employed at any one time during the year	1,033	6,171	849	322	660	5,112	292	285	77
Average number	1,020	6,403	1,087	257	615	6,061	318	300	77
Wages	$345,704	$869,170	$389,881	$102,395	$152,043	$1,082,226	$79,765	$103,958	$19,250
Men, 16 years and over—									
Average number	446	2,962	657	107	348	3,119	66	170	28
Wages	$218,673	$492,803	$268,323	$58,208	$106,334	$756,569	$27,901	$78,779	$12,000
Women, 16 years and over—									
Average number	564	1,949	430	148	193	1,987	252	102	49
Wages	$125,333	$272,372	$121,558	$43,918	$37,508	$251,650	$51,864	$21,098	$7,250
Children, under 16 years—									
Average number	10	1,492	.....	2	74	955	.....	28	.....
Wages	$1,698	$103,995	.....	$269	$8,201	$74,007	.....	$4,081	.....
Average number of wage-earners, including pieceworkers, employed during each month:									
Men, 16 years and over—									
January	461	2,102	574	82	218	2,511	69	167	25
February	475	2,323	730	81	220	2,793	68	168	25
March	475	2,577	716	175	276	3,088	65	168	25
April	488	3,081	705	180	351	3,487	65	168	25
May	483	3,531	702	166	456	3,563	65	169	30
June	334	3,588	634	90	414	3,661	64	170	28
July	345	3,558	715	89	424	3,365	65	170	28
August	344	3,542	629	86	426	3,400	68	171	28
September	483	3,400	629	85	430	3,188	65	171	29
October	479	3,096	638	85	354	3,095	71	170	29
November	480	2,671	605	80	298	2,809	67	171	30
December	504	2,074	611	88	308	2,465	63	171	30

[1] Includes establishments distributed as follows: Alabama, 1; California, 1; Colorado, 2; Iowa, 2; Massachusetts, 1; Nebraska, 2.

TABLE 17.—CHEWING AND SMOKING TOBACCO AND SNUFF: BY STATES AND TERRITORIES, 1900—Continued.

	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	West Virginia.	Wisconsin.	All other states.[1]
Average number of wage-earners, including pieceworkers, employed during each month—Continued.									
Women, 16 years and over—									
January	685	1,389	374	134	119	1,673	232	91	49
February	589	1,526	466	132	106	1,823	228	92	49
March	598	1,620	443	197	153	2,059	248	99	49
April	616	1,954	420	200	207	2,167	239	101	49
May	605	2,307	417	172	271	2,175	236	102	49
June	374	2,401	432	137	212	2,239	238	105	49
July	368	2,433	500	135	213	2,116	240	108	49
August	359	2,464	440	135	227	2,085	257	107	49
September	614	2,274	439	135	227	2,009	269	108	49
October	607	2,029	425	134	194	1,975	294	105	49
November	630	1,628	401	128	197	1,817	274	105	49
December	722	1,366	403	184	196	1,703	265	100	49
Children, under 16 years—									
January	11	1,061	.....	2	34	673	.....	27	.....
February	11	1,142	.....	2	34	718	.....	27	.....
March	11	1,247	.....	2	35	893	.....	29	.....
April	11	1,469	.....	2	76	1,031	.....	29	.....
May	11	1,767	.....	2	99	1,089	.....	29	.....
June	11	1,905	.....	2	103	1,153	.....	28	.....
July	9	1,920	.....	2	105	1,150	.....	28	.....
August	9	1,927	.....	2	100	1,159	.....	28	.....
September	9	1,823	.....	2	93	1,101	.....	29	.....
October	11	1,519	.....	2	69	986	.....	29	.....
November	11	1,232	.....	2	61	829	.....	28	.....
December	11	888	.....	2	75	678	.....	27	.....
Miscellaneous expenses:									
Total	$2,032,836	$6,192,103	$3,001,133	$451,243	$557,149	$4,069,746	$659,763	$845,656	$114,558
Rent of works	$28,493	$8,352	$10,039	$2,051	$1,665	$29,612	$310	$13,390	$6,896
Taxes, not including internal revenue	$11,655	$36,563	$13,926	$5,772	$3,472	$65,846	$3,214	$6,736	$671
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$1,992,688	$6,139,888	$2,977,168	$443,420	$552,012	$3,974,288	$656,239	$825,530	$106,991
Contract work	.....	$7,300	.....	.....	.....	.....	.....	.....	.....
Materials used:									
Total cost	$1,734,072	$4,230,049	$1,917,219	$423,245	$516,369	$4,082,291	$477,253	$472,735	$99,073
Principal materials	$1,701,337	$4,152,463	$1,845,026	$403,088	$489,590	$3,974,326	$472,259	$448,301	$91,390
Purchased in raw state	$1,320,075	$3,027,947	$1,256,477	$329,592	$384,508	$2,908,674	$359,177	$375,965	$58,720
Purchased in partially manufactured form (including "all other materials")	$381,762	$1,124,516	$588,549	$73,496	$105,082	$1,065,652	$113,082	$72,336	$32,670
Fuel	$15,822	$52,259	$19,077	$4,030	$8,585	$56,989	$3,820	$6,886	$1,853
Rent of power and heat	$1,285	.....	$2,276	$60	.....	$1,530	$120	.....	.....
Mill supplies	$6,083	$11,627	$8,227	$3,950	$3,998	$14,254	$1,054	$823	$285
Freight	$9,045	$13,700	$42,613	$12,117	$14,196	$35,192	.....	$16,725	$5,545
Products:									
Total value	$4,632,101	$18,620,816	$5,752,853	$1,247,397	$1,541,475	$10,707,766	$1,362,978	$1,632,354	$295,395
Comparison of products:									
Number of establishments reporting for both years	30	60	15	17	20	53	3	6	6
Value for census year	$2,286,053	$12,437,341	$3,481,971	$967,529	$1,192,927	$7,628,825	$1,360,638	$1,632,354	$262,675
Value for preceding business year	$1,968,701	$9,359,467	$2,720,835	$820,646	$1,011,759	$6,757,975	$1,129,862	$1,356,010	$220,442
Power:									
Number of establishments reporting	21	44	15	6	16	57	3	3	4
Total horsepower	802	2,207	858	763	1,228	2,270	262	510	175
Owned—									
Engines—									
Steam—									
Number	13	48	14	7	21	68	5	3	4
Horsepower	738	1,881	648	511	1,228	2,164	252	475	105
Gas or gasoline—									
Number	2	.....	.....	3	.....	.....	.....	.....	.....
Horsepower	7	.....	.....	66	.....	.....	.....	.....	.....
Water wheels—									
Number	1	.....	.....	2	.....	.....	.....	.....	2
Horsepower	20	.....	.....	75	.....	.....	.....	.....	70
Electric motors—									
Number	.....	27	2	19	.....	1	.....	1	.....
Horsepower	.....	251	180	96	.....	1	.....	35	.....
Other power—									
Number	.....	4	.....	.....	.....	2	.....	.....	.....
Horsepower	.....	75	.....	.....	.....	40	.....	.....	.....
Rented—									
Total horsepower	37	.....	30	15	.....	65	10	.....	.....
Electric	9	.....	30	15	.....	5	.....	.....	.....
Other kind	28	.....	.....	.....	.....	60	10	.....	.....
Furnished to other establishments, horsepower	.....	.....	25	.....	.....	75	.....	30	.....

[1] Includes establishments distributed as follows: Alabama, 1; California, 1; Colorado, 2; Iowa, 2; Massachusetts, 1; Nebraska, 2.

STEMMING AND REHANDLING.

Table 18 is a comparative summary, by states, of the statistics of tobacco, stemmed and rehandled, 1890 and 1900.

TABLE 18.—TOBACCO, STEMMING AND REHANDLING: COMPARATIVE SUMMARY, BY STATES, 1890 AND 1900.

	Year.	United States.	Connecticut.	Kentucky.	Missouri.	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	All other states.
Number of establishments	1900	276	3	98	.....	9	5	48	28	22	54	[1] 9
	1890	292	.....	79	3	.....	13	38	47	5	101	[2] 6
Capital	1900	$12,526,808	$43,050	$4,860,629	.....	$913,167	$101,400	$2,878,688	$616,494	$443,550	$2,454,595	$215,235
	1890	$5,735,610	.....	$1,675,083	$14,700	.....	$282,460	$737,440	$943,846	$8,225	$1,886,806	$187,050
Salaried officials, clerks, etc., number.	1900	424	2	155	.....	14	12	64	5	29	135	8
	1890	[3] 519	.....	110	1	.....	17	54	127	5	191	14
Salaries	1900	$354,677	$872	$113,189	.....	$19,670	$6,500	$86,414	$8,222	$21,920	$91,590	$6,300
	1890	[3] $327,429	.....	$79,944	$244	.....	$11,943	$41,886	$48,789	$417	$130,206	$14,000
Wage-earners, average number	1900	9,654	26	2,302	.....	378	449	2,056	181	461	3,159	642
	1890	5,985	.....	2,262	91	.....	158	707	888	30	1,630	224
Total wages	1900	$1,817,067	$8,705	$439,665	.....	$111,586	$51,873	$552,593	$88,666	$79,243	$454,019	$81,217
	1890	$1,128,517	.....	$363,396	$14,518	.....	$16,127	$241,502	$150,688	$3,432	$303,479	$35,430
Men, 16 years and over	1900	4,698	26	1,656	.....	164	130	776	94	302	1,408	142
	1890	3,804	.....	1,602	68	.....	78	349	814	23	816	54
Wages	1900	$1,109,462	$8,705	$346,769	.....	$68,184	$24,292	$283,077	$24,141	$60,925	$264,031	$29,338
	1890	$815,933	.....	$286,322	$11,922	.....	$10,498	$134,002	$147,874	$3,172	$204,213	$17,930
Women, 16 years and over	1900	4,022	.....	382	.....	204	219	1,237	60	85	1,381	454
	1890	1,641	.....	358	12	.....	62	260	57	6	736	150
Wages	1900	$623,379	.....	$63,979	.....	$42,030	$22,316	$264,405	$12,085	$11,687	$157,977	$48,900
	1890	$253,619	.....	$62,315	$1,910	.....	$4,349	$82,100	$2,520	$280	$94,795	$15,400
Children, under 16 years	1900	934	.....	264	.....	10	100	43	27	74	370	46
	1890	540	.....	302	11	.....	18	98	12	1	78	20
Wages	1900	$84,226	.....	$28,917	.....	$1,372	$4,765	$5,111	$2,440	[1] $6,631	$32,011	$2,979
	1890	$58,965	.....	$24,759	$681	.....	$1,280	$25,400	$244	$80	$4,471	$2,100
Miscellaneous expenses	1900	$525,016	$648	$147,782	.....	$14,220	$11,550	$141,173	$11,742	$28,916	$160,171	$8,814
	1890	$424,869	.....	$110,641	$390	.....	$8,891	$36,032	$78,652	$1,238	$182,599	$6,426
Cost of materials used	1900	$14,198,349	$65,944	$4,025,464	.....	$671,147	$635,910	$2,587,583	$502,733	$904,289	$4,453,205	$352,074
	1890	$12,813,108	.....	$2,589,005	.....	.....	$444,500	$2,615,478	$1,555,536	$31,387	$5,420,492	$156,760
Value of products	1900	$19,099,032	$82,404	$5,467,360	.....	$880,405	$759,000	$3,899,952	$625,394	$1,178,480	$5,726,859	$539,178
	1890	$16,209,761	.....	$3,474,750	$18,432	.....	$516,750	$3,371,794	$2,054,360	$39,032	$6,487,643	$247,000

[1] Includes establishments distributed as follows: Florida, 1; Georgia, 1; Illinois, 1; Indiana, 1; Maryland, 2; South Carolina, 1; Wisconsin, 2.
[2] Includes establishments distributed as follows: Connecticut, 2; Indiana, 1; New York, 2; Wisconsin, 1.
[3] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 20.)

The statistics for this branch of the tobacco industry were first shown at the census of 1890, and there are, therefore, no statistics earlier than those shown in Table 18 available for comparison. Tobacco stemming and rehandling is an industry requiring small expenditure of manufacturing forces, and its character is well described by the terms of its classification. It consists principally in sizing the leaves and sorting them as to shade, general character, and quality; stemming and drying them for export; and treating them by fermentation and other processes according to the requirements of each manufacturer's trade.

In 1900 there were 8 states having more than three establishments each. The industry was largely limited to the states of Virginia, Kentucky, Ohio, Tennessee, and New York, in that order. These 5 states combined represented $17,093,056, or 89.5 per cent of the total value of products. The industry was, therefore, well localized within the tobacco-growing districts.

Of the capital invested in stemming and rehandling of tobacco, 2.7 per cent was in land; 7.9 per cent in buildings; 3.5 per cent in machinery, tools, and implements; and 85.9 per cent in cash and sundries.

Table 19 shows the cost of materials and the per cent each class is of the total, 1900.

TABLE 19.—TOBACCO, STEMMING AND REHANDLING: COST OF MATERIALS, 1900.

	1900	
	Amount.	Per cent of total.
United States	$14,198,349	100.0
Purchased in raw state	13,790,693	97.1
Purchased in partially manufactured form [1]	262,013	1.9
Fuel	50,588	0.4
Rent of power and heat	3,693	[2]
Freight	91,362	0.6

[1] Includes "all other materials" and "mill supplies;" the latter is shown separately in Table 20.
[2] Less than one-tenth of 1 per cent.

Table 20 is a detailed summary, by states and territories, for the census year ending May 31, 1900.

TABLE 20.—TOBACCO, STEMMING AND REHANDLING, BY STATES AND TERRITORIES: 1900.

	United States.	Connecticut.	Kentucky.	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	All other states.[1]
Number of establishments	276	3	98	9	5	48	28	22	54	6
Character of organization:										
Individual	120	2	47	2	.....	14	22	11	18	4
Firm and limited partnership	142	1	46	7	5	31	6	11	32	3
Incorporated company	13	.....	5	.....	.....	2	.....	.....	4	2
Miscellaneous	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Capital:										
Total	$12,526,808	$43,050	$4,860,629	$913,167	$101,400	$2,878,688	$616,494	$443,550	$2,454,595	$215,235
Land	$339,810	$400	$163,285	$6,600	$900	$52,875	$7,140	$28,305	$29,250	$51,055
Buildings	$985,863	$2,500	$472,940	$27,400	$14,700	$207,268	$54,000	$64,805	$121,050	$21,200
Machinery, tools, and implements	$439,267	$150	$220,240	$5,167	$16,800	$39,176	$4,284	$14,420	$128,750	$10,280
Cash and sundries	$10,761,868	$40,000	$4,004,164	$874,000	$69,000	$2,579,369	$551,070	$336,020	$2,175,545	$132,700
Proprietors and firm members	429	4	143	17	10	85	34	33	89	14
Salaried officials, clerks, etc.:										
Total number	424	2	155	14	12	64	5	29	135	8
Total salaries	$354,677	$872	$113,189	$19,670	$6,500	$86,414	$8,222	$21,920	$91,590	$6,300
Officers of corporations—										
Number	12	.....	6	.....	.....	1	.....	.....	5	.....
Salaries	$28,150	.....	$20,500	.....	.....	$1,000	.....	.....	$6,650	.....
General superintendents, managers, clerks, etc.—										
Total number	412	2	149	14	12	63	5	29	130	8
Total salaries	$326,527	$872	$92,689	$19,670	$6,500	$85,414	$8,222	$21,920	$84,940	$6,300
Men—										
Number	405	2	143	14	12	62	5	29	130	8
Salaries	$322,991	$872	$89,503	$19,670	$6,500	$85,064	$8,222	$21,920	$84,940	$6,300
Women—										
Number	7	.....	6	.....	.....	1	.....	.....	.....	.....
Salaries	$3,536	.....	$3,186	.....	.....	$350	.....	.....	.....	.....
Wage-earners, including pieceworkers and total wages:										
Greatest number employed at any one time during the year	16,552	66	4,502	738	760	3,159	423	763	5,079	1,062
Least number employed at any one time during the year	7,416	11	1,949	495	176	2,005	291	469	1,703	317
Average number	9,654	26	2,302	378	449	2,056	181	461	3,159	642
Wages	$1,817,067	$8,705	$439,665	$111,586	$51,373	$552,593	$88,666	$79,243	$454,019	$81,217
Men, 16 years and over—										
Average number	4,698	26	1,656	164	130	776	94	302	1,408	142
Wages	$1,109,462	$8,705	$346,769	$68,184	$24,292	$283,077	$24,141	$60,925	$264,031	$29,338
Women, 16 years and over—										
Average number	4,022	.....	382	204	219	1,237	60	85	1,381	454
Wages	$623,379	.....	$63,979	$42,030	$22,316	$264,405	$12,085	$11,687	$157,977	$48,900
Children, under 16 years—										
Average number	934	.....	264	10	100	43	27	74	370	46
Wages	$84,226	.....	$28,917	$1,372	$4,765	$5,111	$2,440	$6,631	$32,011	$2,979
Average number of wage-earners, including pieceworkers, employed during each month:										
Men, 16 years and over—										
January	6,346	42	2,755	299	160	717	147	445	1,638	143
February	6,564	66	2,673	310	147	827	281	479	1,688	143
March	6,316	61	2,535	273	103	960	227	481	1,524	152
April	5,490	20	2,081	202	84	963	202	464	1,330	144
May	4,730	20	1,699	119	66	977	158	447	1,106	138
June	3,797	5	1,583	68	30	778	43	404	853	83
July	3,005	5	1,174	65	8	756	20	265	634	78
August	2,809	5	756	62	145	696	15	119	869	142
September	3,193	3	560	69	205	669	20	49	1,485	131
October	3,796	3	697	83	205	671	18	58	1,889	177
November	4,643	30	1,239	177	205	660	18	124	2,015	180
December	5,687	50	2,175	235	205	636	38	290	1,866	197
Women, 16 years and over—										
January	5,222	.....	806	388	305	1,018	60	127	1,893	625
February	5,357	.....	761	392	280	1,151	72	128	1,914	659
March	5,347	.....	704	388	205	1,393	75	128	1,795	659
April	4,267	.....	431	316	84	1,480	74	128	1,155	599
May	3,737	.....	289	220	70	1,520	71	125	917	525
June	2,629	.....	178	25	20	1,421	55	114	626	190
July	2,206	.....	108	5	.....	1,307	50	100	461	175
August	2,371	.....	67	5	164	1,227	50	30	655	173
September	2,922	.....	67	15	375	1,143	54	5	1,068	195
October	4,197	.....	130	15	375	1,133	54	5	1,987	498
November	4,743	.....	341	299	375	1,084	54	36	2,106	498
December	5,266	.....	702	383	375	1,015	54	97	1,992	648
Children, under 16 years—										
January	1,472	.....	467	17	135	19	46	125	607	56
February	1,406	.....	477	23	120	22	57	124	527	56
March	1,269	.....	490	21	60	32	61	125	424	56
April	970	.....	373	19	40	38	59	122	266	53
May	818	.....	303	4	30	57	76	122	173	53
June	561	.....	204	4	20	108	6	71	113	35
July	416	.....	149	1	.....	90	.....	69	83	25
August	493	.....	90	.....	101	84	.....	27	166	25
September	550	.....	39	.....	160	33	5	2	281	30
October	874	.....	32	.....	177	16	5	2	586	56
November	1,025	.....	146	14	179	14	5	2	608	56
December	1,354	.....	396	15	180	9	5	92	602	56
Miscellaneous expenses:										
Total	$525,016	$648	$147,782	$14,220	$11,550	$141,178	$11,742	$28,916	$160,171	$8,814
Rent of works	$83,718	$40	$16,934	$6,625	$4,550	$8,497	$1,295	$1,025	$43,877	$875
Taxes, not including internal revenue	$65,711	$141	$19,643	$1,108	$1,150	$13,483	$638	$1,934	$25,886	$1,728
Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$367,867	$467	$109,105	$6,487	$5,850	$116,193	$9,809	$25,657	$88,088	$6,211
Contract work	$7,720	.....	$2,100	.....	.....	$3,000	.....	$300	$2,320	.....
Materials used:										
Total cost	$14,198,349	$65,944	$4,025,464	$671,147	$635,910	$2,587,583	$502,733	$904,289	$4,453,205	$352,074
Principal materials	$14,047,426	$65,284	$3,969,497	$666,222	$631,950	$2,574,470	$500,006	$899,861	$4,392,257	$347,879
Purchased in raw state	$13,790,693	$65,184	$3,885,926	$650,482	$620,500	$2,544,204	$482,991	$889,154	$4,318,144	$334,108
Purchased in partially manufactured form (including "all other materials")	$256,733	$100	$83,571	$15,740	$11,450	$30,266	$17,015	$10,707	$74,113	$13,771

[1] Includes establishments distributed as follows: Florida, 1; Georgia, 1; Illinois, 1; Indiana, 1; Maryland, 2; South Carolina, 1; Wisconsin, 2.

TABLE 20.—TOBACCO, STEMMING AND REHANDLING, BY STATES AND TERRITORIES: 1900—Continued.

	United States.	Connecticut.	Kentucky.	New York.	North Carolina.	Ohio.	Pennsylvania.	Tennessee.	Virginia.	All other states.[1]
Materials used—Continued.										
Total cost—Continued.										
Fuel	$50,588	$100	$15,962	$485	$3,400	$4,434	$529	$2,715	$22,528	$435
Rent of power and heat	$3,693	$60	$985	$295	.....	$728	.....	$75	$1,550	.....
Mill supplies	$5,280	.....	$1,606	$45	$360	$205	.....	$65	$2,939	$60
Freight	$91,362	$500	$37,414	$4,100	$200	$7,746	$2,198	$1,573	$33,931	$3,700
Products:										
Total value	$19,099,032	$82,404	$5,467,860	$880,405	$759,000	$3,839,952	$625,394	$1,178,480	$5,726,859	$539,178
Comparison of products:										
Number of establishments reporting for both years	193	3	67	8	4	28	15	15	48	5
Value for census year	$15,706,219	$82,404	$4,521,482	$720,405	$540,000	$2,570,332	$413,926	$973,646	$5,448,659	$435,365
Value for preceding business year	$14,850,992	$78,000	$4,143,062	$760,416	$495,000	$2,481,165	$384,164	$1,160,000	$4,916,320	$432,865
Power:										
Number of establishments reporting	80	1	26	3	3	9	.....	3	32	3
Total horsepower	2,469	2	1,043	26	85	80	.....	32	1,109	92
Owned—										
Engines—										
Steam—										
Number	77	.....	29	.....	3	3	.....	3	36	3
Horsepower	2,309	.....	1,033	.....	85	28	.....	32	1,039	92
Gas or gasoline—										
Number	3	.....	.....	.....	.....	3	.....	.....	.....	.....
Horsepower	26	.....	.....	.....	.....	26	.....	.....	.....	.....
Electric motors—										
Number	3	.....	.....	.....	.....	.....	.....	.....	3	.....
Horsepower	10	.....	.....	.....	.....	.....	.....	.....	10	.....
Rented—										
Total horsepower	124	2	10	26	.....	26	.....	.....	60	.....
Electric	52	.....	.....	26	.....	26	.....	.....	.....	.....
Other kind	72	2	10	.....	.....	.....	.....	.....	60	.....
Furnished to other establishments, horsepower	7	.....	.....	.....	.....	.....	.....	.....	7	.....

[1] Includes establishments distributed as follows: Florida, 1; Georgia, 1; Illinois, 1; Indiana, 1; Maryland, 2; South Carolina, 1; Wisconsin, 2.

HISTORICAL AND DESCRIPTIVE.

The cultivation of tobacco and the use of its manufactures are of such antiquity that authentic history does not record their beginnings. The claims of certain European and Asiatic countries to an acquaintance with the plant prior to the discovery of America by Columbus are not supported by accepted history nor satisfactorily demonstrated by the researches of the antiquarian or the archæologist. It is fairly well settled that tobacco is indigenous to the Western Hemisphere, and that the aborigines practiced its cultivation and use from remotest times. Europeans learned its nature and effects from the American savage and spread the knowledge to the rest of the world. In November, 1492, two sailors sent by Columbus into the interior of Cuba returned with accounts of having seen the natives carrying firebrands and exhaling smoke from their mouths and nostrils. Investigation revealed that the firebrands were made from the leaves of tobacco, rolled and burned in a sheath of Indian corn, and that the smoke was inhaled for sensations of pleasure and exhilaration. The instrument used for inhaling the smoke was made from hollow cane forked in shape of the letter Y, the small ends being inserted into the nostrils and the large end applied to the burning leaves.[1] The habit of snuff taking among the natives was described first by Roman Pane, a Franciscan, who accompanied Columbus on his second voyage, and the practice of tobacco chewing was first observed by Spaniards on the coast of South America in 1502. Tobacco was consumed in one form or another by the aborigines from Canada to Patagonia, and, especially in the form of smoking, its use was an immemorial custom.

Tobacco was first taken to Europe by Hernandez de Toledo, who introduced it into Spain and Portugal from Santo Domingo in 1559. In the same year it was introduced into France from the Spanish Peninsula by Jean Nicot, the French ambassador at Lisbon.[2] It is said to have been used in Italy as early as 1560. In 1585 it was carried to England by Sir Francis Drake and his companions on a return voyage from Virginia, and Sir Walter Raleigh introduced among the Elizabethan courtiers the fashion of pipe smoking, which spread through England with great rapidity. In 1610 smoking is known to have been practiced as far east as Constantinople. Tobacco was cultivated in Holland in 1615, and in 1620 smoking was introduced into Germany. In 1631 the use of tobacco began in Austria, where it was carried by Swedish troops, and in 1653 it is known to have been used in Switzerland.[3] In a period of three hundred years tobacco has circled the earth on practically every parallel within the limits of civilization. It is known everywhere, except among a few barbaric peoples in inaccessible countries, and exceeds every other narcotic in the universality of its use. It is probably exceeded only by salt in width of distribution and cosmopolitan consumption. The adaptability of the plant to varying climatic conditions has

[1] Knickerbocker Magazine, Vol. LIV, 1859, page 148.

[2] Penny Magazine, London, Vol. I, 1832, page 148.

[3] Nile's Register, Vol. XV, page 110.

been an important factor in its dissemination. While it responds, to the extent of pronounced modifications, to the varying influences of soil, climate, and methods of cultivation, its essential characteristics will develop in the cold climate of Canada or on the arid plains of Java. Certain districts produce tobacco having distinct characteristics just as certain provinces produce varieties of grapes that make distinct types of wine. Great diversity of taste is also shown among the people of different nations, in their demand for the different types of tobacco grown in various parts of the world, and it is natural, therefore, that the commodity should become one of importance in international trade. In foreign countries its cultivation and manufacture are frequently made government monopolies, and in some its cultivation is prohibited.

The first tobacco cultivated by a European within the present limits of the United States was grown by John Rolfe at Jamestown, Va., in 1612, five years after the settlement of the colony. As early as 1615 the fields, gardens, streets, and public squares of Jamestown were planted with tobacco. It was the one commodity which sustained the struggling settlement, because it readily commanded, in reciprocal trade with the mother country, the necessaries of life. It was the medium of exchange and the standard of value. In 1619, 20,000 pounds were shipped to England. The profits were so satisfactory to the growers that even the cultivation of food crops was neglected for that of tobacco, and it was restricted for a time by legislative enactment. In 1621, 60,000 pounds were grown, of which 55,000 pounds were exported to Holland, the shipments being diverted to that country because of the excise levied by England. In England the legislation of the Stuarts and that of Cromwell were alike in opposition to the use of tobacco, and it was almost completely stamped out by the Protectorate. With the Restoration, however, it reappeared, and its consumption has since increased steadily with every year.

In 1731 the combined exports of Virginia and Maryland were 36,000,000 pounds. From 1763 to 1770, the average annual exports from all the colonies amounted to 66,780,000 pounds, and for the four years immediately preceding the Revolution the average quantity annually exported was 100,000,000 pounds. During the Revolutionary struggle the exports dropped to an average of 12,000,000 pounds annually.

The settlers of a new country take with them the customs and pursuits of the old, and the Virginians who settled Kentucky early introduced into the new territory the cultivation of tobacco, which was grown as a commodity in parts of Kentucky and Tennessee as early as 1810 and, prior to 1833, was shipped by boat to New Orleans, where it was purchased for foreign consumption. As the production increased, factories were established for purchasing loose tobacco and stemming it for the English market. The first inspection warehouses in the United States had been established in Virginia in 1730. In 1839 similar warehouses were established at Louisville, Ky., and in 1845, at Clarksville, Tenn. With the introduction of such local markets the tobacco trade of the Mississippi Valley developed with considerable rapidity, but always with precision.[1]

In New England some tobacco was grown in the decade ending with 1650, but its cultivation was abandoned until the beginning of the Nineteenth century, when it gradually revived. By 1825 the crop was such as to encourage the establishment of a warehouse at Warehouse Point, Connecticut. About 1833 it was ascertained that a variety, possessing in remarkable degree the fineness of texture, strength of tissue, and smoothness of surface, so desirable for cigar wrappings, could be grown successfully in Connecticut, and the census returns since 1840 show an uninterrupted increase in its cultivation in that state, except at the census of 1890. This single interruption is explained by the influence of legislative enactments affecting the tariff on imported leaf suitable for cigar wrappers. The profits of the industry in Connecticut stimulated the cultivation of tobacco in eastern Pennsylvania, central New York, and later in the Miami Valley of Ohio, and in southern Wisconsin. In 1900 the combined production of Connecticut, Pennsylvania, New York, Ohio, and Wisconsin was 183,849,340 pounds.

Especially in the states of the North, every town of any considerable size has its local cigar factory supplying in part the local demand and extending its trade to neighboring villages and towns in proportion to the aggressiveness of the manufacturer and his ability to succeed against competition. The material used in these local factories consists of small lots of leaf tobacco varying in character, quality, and cost according to the quality of the cigars to be made and according as the material is intended for fillers, binders, or wrappers. Such material is usually purchased from importers, wholesalers, or rehandlers, and in such limited quantities as to be quickly worked up and realized on in the local marts. The live capital involved is, therefore, not necessarily large even in proportion to the magnitude of the business. The selection, preparation, and apportionment of the filler, the cutting of the binders and wrappers, and the binding and wrapping are all done by hand. After binding, the unfinished cigars are usually placed in forms or molds and left for some hours in hand presses until the desired shape has become fixed, when they are ready for wrapping. When wrapped, the cigars are assorted into lots having the same shade, and boxed for sale. The work is usually done in rented rooms, and no capital, as defined by the Census Office, is involved in land and buildings. A set of molds and a hand press constitute the principal equipment. In contradistinction

[1] Tobacco Leaf, Killebrew and Myrick, New York, 1897, pages 3–15.

to this class of establishments, is the large factory, representative of the purely commercial aspect of the industry, housed in a large building whose architecture is typical of the modern factory, located usually in a large city, equipped with modern and expensive machinery, employing thousands of wage-earners, and manufacturing millions of cigars and cigarettes annually.

The first cigars consumed in the United States were imported, but the exact date of the first importation is not known because it was included in miscellaneous merchandise. The separate tabulation of imported cigars was begun in 1804, in which year 4,001,000 were received, principally from the West Indies. The first cigar manufactories in the United States were established in Connecticut in 1810, but it is believed that the household manufacture of cigars had been carried on in the Connecticut Valley for several years prior to that date. After the first factories were established at East Windsor and Suffield, Conn., the industry gradually spread through the state and into the other states of the New England group. By 1856, 600 persons were employed in making cigars at various points from Springfield, Mass., to Middletown, Conn. In 1860 the Connecticut Valley had 45 factories, with capital approximating $400,000; 731 wage-earners, $274,911 for wages; $381,000 for cost of materials; and $1,000,000 for value of products. In 1870 Connecticut alone had 235 factories, whose products approximated $1,150,000 in value.[1]

Kentucky followed Connecticut in the establishment of cigar factories. As early as 1816 a factory is said to have been established at Maysville. The industry gradually diffused through the state and into Ohio and Tennessee. In 1825 comparatively small factories were found more or less widely scattered through New York and Pennsylvania, and by 1840 factories in considerable number were in operation in New York, Pennsylvania, Maryland, and Virginia. The first cigars made in the United States were almost exclusively the product of domestic leaf, but the importation of Cuban tobacco began early in the history of the industry, and by 1847 had assumed such proportions as to be tabulated in the customs returns. The early manufacturers in the United States had to contend against the importation of cheap cigars from Germany, where their manufacture and consumption date from 1796. The tariff acts of 1861, 1862, and 1864 prevented the importation of the German product, and in consequence the industry in the United States received such an impetus that it has continued in practically uninterrupted growth to the present time.[2] The first internal-revenue law laying a tax on cigars and other forms of manufactured tobacco, was passed to meet in part the exigencies of the Civil War, and took effect July 1, 1862. By this act the revenue tax on cigars varied from $1.50 to $3.50 per thousand, according to value. The organization of the Bureau of Internal Revenue for the collection of taxes under the elaborate system of excise, dates from the act of 1862, and statistics of all forms of tobacco since that time are more complete and reliable than formerly. No very large factories were in existence prior to 1870. In the decade ending with 1880, however, extraordinary prosperity attended the industry; the first large manufactories were then established and commercial cigar manufacture was outlined and became fixed.[2]

Within the last few years both the cigar and the cigarette manufacture have been revolutionized by machinery. As cigar making is widely diffused in the form of numerous small establishments in which the work is done by hand, the utilization of modern machinery in the manufacture of cigars is not as general as in that of cigarettes, which is concentrated in large factories. Four cities, namely, New York, N. Y.; Richmond, Va.; Durham, N. C.; and Rochester, N. Y., produce about 94 per cent of all the cigarettes manufactured in the United States, and practically all are machine made. Considering the large number of very small cigar factories in the United States, comparatively few establishments of this class are sufficiently large to make a complete equipment of modern machinery a paying investment. Taking the largest factories, however, as representative of the application of modern machinery to the industry, it is a fact that both cigar and cigarette manufacturers are utilizing some of the greatest contributions of genius to the lessening of the world's work. Everything, from the stemming of the leaf to the payment of wages to the employees of the factory, is done by machinery. In a modern cigarette factory the prepared tobacco and the sheets of paper used for wrappings are fed to machines which cut the paper into proper size for the wrapper, gum its edge, measure the exact quantity of tobacco needed for each cigarette, wrap it, make the edges of the wrapper adhere, cut the ends, and pack the cigarettes in boxes. In the manufacture of cigars, the prepared filler is placed in the hopper of a machine which apportions the quantity necessary for each cigar, places it in the binder spread to receive it by the operator of the machine, and rolls it. The wrapper is subsequently added by hand or by machinery.

In the last quarter-century the manufacture and consumption of cigarettes in the United States have grown with marvelous rapidity. In 1875, approximately 40 millions, and in 1900, 3,260 millions were consumed, an increase of more than eightyfold in twenty-five years. Much of the popularity of cigarette smoking has its origin in business and social conditions which evolve and govern habits of living. For many years there has been an increasing demand for tobacco in a form that

[1] United States Tobacco Journal, special century issue, 1900, pages 33–36.

[2] Ibid.

affords a short, inexpensive smoke, producing immediate effects. The cigarette is made from a specially mild tobacco, and the consumer almost invariably inhales the smoke, which comes in contact with the delicate membranes of the respiratory tract. In this way the active principle of the tobacco is quickly taken into the circulation, producing immediate physiological results. The tobacco selected is usually of a very light shade, which comes from the variety of the plant, the district in which it is grown, and methods of curing, or all these in combination. Secret processes of bleaching are said to be used by some manufacturers. Harshness may sometimes be subdued into desired mildness by dipping or soaking the tobacco in water slightly acidulated with hydrochloric acid. The selecting, blending, saucing, and general methods of treatment are in accordance with the secret formula of each establishment.

The crude hand manufacture of chewing and smoking tobacco and snuff from the natural and unflavored leaf has grown to the modern manufacture of a multitude of forms, which are the products of elaborate systems of selection, blending, fermentation, flavoring, and saucing, designed to satisfy the tastes of the various classes of consumers. As to form, there are two general classes of smoking tobacco put upon the market, namely, the granulated or flake, and the cut or shredded forms. The former is produced by granulating machines of different styles and varying capacity, in which the breaking and sifting principles predominate. The latter class is produced by feeding the prepared tobacco, flavored and gummed, into machines which first compress it and, in turn, feed it to rotating or vertically reciprocating knives, which shred it to any desired fineness; it is then dried and "bulked," after which it is packed in paper, foil, cloth, tin, or glass packages in a multitude of sizes and styles.

The cost of producing smoking tobacco has been greatly lessened within the last few years by the invention and introduction into the large factories of ingeniously constructed machinery to do the packing. The prepared tobacco and the sheet of paper in which it is to be wrapped are fed to a machine simultaneously; the result is a neatly wrapped package ready for the shelves of the retailers. Between thirty and forty thousand packages are turned out by a single machine in a day of ten hours. A form of smoking tobacco known as cut plug is popular with a large class of consumers. It is a form of shredded tobacco, but made more compact by greater pressure. After the leaf is prepared (sauced and gummed) it is pressed into cakes of desired thickness by hydraulic or steam power presses. The cakes are then cut into plugs of desired width by machines not unlike those used in paper mills for cutting paper. The plugs are next run through machines with vertically-reciprocating knives which cut them into transverse sections ready for packing in layers in tin boxes.

The manufacture of plug chewing tobacco is, compared with that of other forms, a simple process. After the preparation of the filler, it is pressed by hydraulic or steam power presses into cakes or plugs of varying width, length, thickness, and style, after which it is wrapped and boxed. Fine-cut chewing tobacco is made by machinery very similar to that employed in manufacturing smoking tobacco, the leaf being cut into much finer shreds and sauced or "cased" according to the different formulæ of different establishments.

The making of snuff is the most complicated of all the processes of tobacco manufacture. This article, as found on the market, may be roughly divided into two classes, namely, dry and moist, each of which varies greatly in quality. Snuff is sometimes manufactured in connection with cigars and chewing tobacco, as it affords an opportunity to utilize the parts of the leaf not consumed in those products. The material for dry snuffs is first dampened and put through cutting machines, which chop it finely. It is then subjected to a high temperature and rendered perfectly dry, when it is ready for grinding. The grinding machines preserve much of the principle governing the first manufacture of snuff, which was reduced to a rough powder by pounding or grating. The commonest form of grinding machine consists of a receptacle shaped like the frustum of a cone inverted. A set of rollers of corresponding inclination revolve close to the inner surface, grinding the tobacco between to a fine powder. The finished article is packed by machine packers into bladders, tin cans, earthenware jars, glass tumblers, etc. Scotch, Irish, and Welsh snuffs are the commonest forms of the dry class.

Moist snuffs are of infinite variety. The material used in their manufacture is moist when ground, and is not reduced to a fine powder like the dry snuffs. After grinding, the "flour" is subjected to as many different processes and manipulations as there are manufacturers. Many of these involve frequent handling and bulking to control the different stages of sweating or fermentation which gives character to the finished article, darkening it and developing its peculiar flavor. In addition to saucing, fermentation, and manipulation, ingredients are added to flavor and perfume.

The largest tobacco factories are gathering under one roof the manufacture of practically everything that contributes to the tobacco industry. Factories are now fully equipped for manufacturing the tin, paper, cloth, and other packages in which the products are packed for market, as well as boxes or cases in which they are shipped. Equipment for printing and lithographing labels and advertising posters is also an adjunct of a modern factory, so that there is little demand to be supplied by outside establishments.

MANUFACTURED ICE.

MANUFACTURED ICE.

By Arthur L. Hunt.

The following report presents the statistics concerning the establishments engaged in the manufacture of ice for sale during the census year ending May 31, 1900. Ice produced by mechanical or chemical means is commonly, but not very appropriately, designated as "artificial," to distinguish it from ice produced by nature. Artificial refrigeration consists simply in the removal of heat, and is accomplished by the use of ammonia, either aqua or anhydrous, or some other volatile liquid, such as sulphurous dioxide or ether, which absorbs heat upon evaporation.

The manufacture of ice as an industry existed as early as 1866, but has attained commercial importance only within the past fifteen or twenty years. The industry naturally had its inception in the South, where ice is not harvested in commercial quantities, and where the difficulties and loss attending its shipment from the North precludes its general use, and has extended not only throughout all the Southern states but into the majority of the Northern and Western states. The ice industry, in connection with the operation of cold-storage houses and the introduction of refrigerator cars, has aided greatly in the development of the natural resources of different sections of the United States, and forms a most important factor in the industrial development and progress of not only the Southern states but many of the Northern states. Refrigerator cars insure the safe transportation of perishable articles, and cold-storage warehouses obviate the necessity of their shipment as soon as produced or their consumption as soon as delivered, thus allowing the goods to be held before or after shipment until there is a market for them. Artificial refrigeration has thus given a great stimulus to the production of early vegetables and small fruits, especially strawberries, in the South and on the Pacific coast. It has also been of great importance to the slaughtering and meat packing industry, facilitating the storage and the handling of dressed meats and making it possible to carry on the operations of this industry throughout the entire year, whereas previously it had been limited to the winter season.

The statistics presented in this report relate exclusively to establishments which manufactured ice for sale. Many of these establishments, however, operate cold-storage houses in connection with their ice plants, and the receipts for storage are included in the total value of products. The report does not include the statistics of establishments which manufactured ice for their own consumption, such as breweries, meat and provision cold-storage houses, chemical factories, and various other establishments.

Table 1 presents in summarized form the statistics of the industry as returned at the censuses of 1870 to 1900, inclusive, with the percentages of increase for each decade. The totals for 1900 include returns from 12 establishments, the reports for which were not secured in time to be included in the general report upon this industry, and therefore these totals do not agree with those given in Parts I and II, Manufactures. Table 2 shows the totals for the industry for 1900 as given in the general report, and also the totals for the additional reports received, a combination of the two making the totals shown in Table 1

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

	Date of census.				Per cent of increase.		
	1900[1]	1890	1880	1870	1890 to 1900	1880 to 1890	1870 to 1880
Number of establishments	787	222	35	4	254.5	534.3	775.0
Capital	$88,204,054	$9,846,468	$1,251,200	$434,000	288.0	687.0	188.3
Salaried officials, clerks, etc., number	1,545	[2] 439	([3])	([3])	251.9	.....	.....
Salaries	$1,234,803	[2] $345,191	([3])	([3])	257.7	.....	.....
Wage-earners, average number	6,933	2,826	447	97	145.3	532.2	360.8
Total wages	$3,424,305	$1,095,996	$140,885	$40,600	212.4	677.9	247.0
Men, 16 years and over	6,889	2,811	389	96	145.1	622.6	305.2
Wages	$3,416,844	$1,094,634	([3])	([3])	212.1	.....	.....
Women, 16 years and over	8	.....	50	.....	.....	.....	.....
Wages	$8,592	.....	([3])	.....	.....	.....	.....
Children, under 16 years	36	15	8	1	140.0	87.5	700.0
Wages	$3,869	$1,362	([3])	([3])	184.1	.....	.....
Miscellaneous expenses	$1,779,890	$477,485	([4])	([4])	272.8	.....	.....
Cost of materials used	$8,339,724	$940,699	$158,112	$82,165	255.0	495.0	92.4
Value of products	$13,874,513	$4,900,988	$544,763	$258,250	183.1	799.7	110.9

[1] Exclusive of Hawaii, which reports as follows: Number of establishments, 4; capital, $137,271; salaried officials, clerks, etc., 4; salaries, $6,365; wage-earners, all men, average number, 19; total wages, $12,015; miscellaneous expenses, $5,805; cost of materials, $15,735; value of products, $56,522. The figures reported for 1900 include the statistics for 12 establishments, the schedules for which were received too late to be included in the totals for this industry as presented in the report on Manufactures, Parts I and II.

[2] Includes proprietors and firm members, with their salaries; number only reported in 1900, but not included in this table. (See Table 11.)

[3] Not reported separately

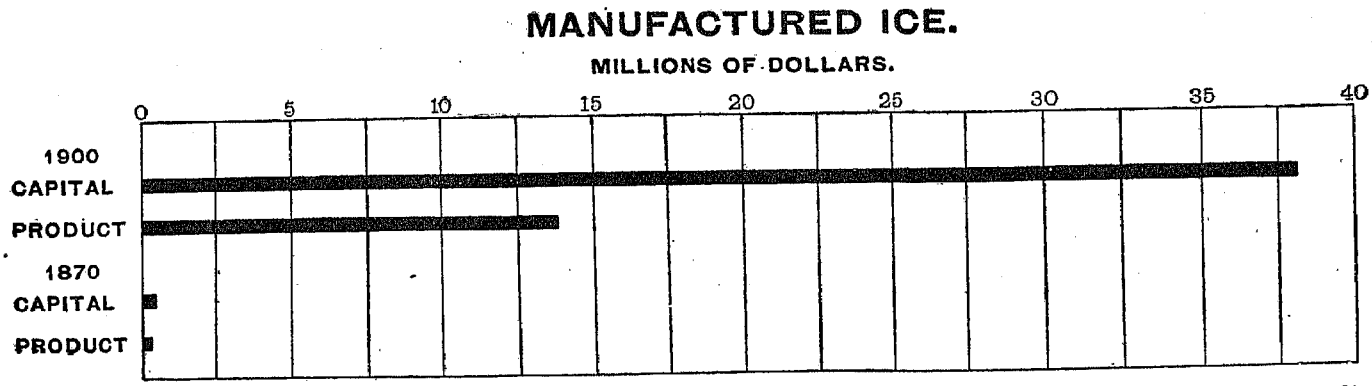
[4] Not reported.

TABLE 2.—SUMMARY, 1900.

	Reported in Manufactures, Parts I and II.	Additional establishments.
Number of establishments	775	12
Capital	$38,019,507	$184,547
Salaried officials, clerks, etc., number	1,531	14
Salaries	$1,226,331	$8,472
Wage-earners, average number	6,880	53
Total wages	$3,402,745	$21,560
Men, 16 years and over	6,838	51
Wages	$3,395,428	$21,416
Women, 16 years and over	8	.....
Wages	$3,592	.....
Children, under 16 years	34	2
Wages	$3,725	$144
Miscellaneous expenses	$1,773,692	$6,198
Cost of materials used	$3,312,393	$27,331
Value of products	$13,780,978	$93,535

Table 1 indicates the remarkable progress which has taken place in this industry during the thirty years ending with 1900. Statistics of the manufacture of ice first appear in the census of 1870, when returns were received from 4 establishments with a capital of $434,000 and products valued at $258,250. In 1900 the number of establishments was 787, the capital $38,204,054, and the value of products $13,874,513. The growth of the industry is perhaps more forcibly illustrated by the following diagram:

COMPARATIVE GROWTH OF CAPITAL AND PRODUCTS, 1870 AND 1900.



During the period from 1870 to 1880 the number of establishments increased from 4 to 35, the capital from $434,000 to $1,251,200, and the value of products from $258,250 to $544,763. A comparison of the figures reported for 1890 with those reported for 1880 indicates that most notable progress occurred in this industry during this decade. The number of establishments increased from 35 to 222; the capital from $1,251,200 to $9,846,468; and the value of products from $544,763 to $4,900,983. During the past decade the industry has made still greater advances, although the per cent of increase is not as large as that shown during the preceding decade. The number of establishments increased from 222 to 787, an increase of 565, or 254.5 per cent; the capital from $9,846,468 to $38,204,054, an increase of $28,357,586, or 288 per cent; and the value of products from $4,900,983 to $13,874,513, an increase of $8,973,530, or 183.1 per cent.

A comparison of the average capital and value of products per establishment for the several censuses sheds further light upon the development of the industry since 1870. In that year the average capital per establishment was $108,500 and the average value of products $64,563. These averages are higher than for any of the subsequent censuses, probably because the four establishments included one which reported products valued at nearly $250,000. This establishment had been erected in New Orleans in 1866 and was the first ice factory of importance built in the United States. At this time nearly all of the natural ice used in New Orleans came from Boston, and, on account of the distance, difficulties of shipping, and loss by melting, the price was excessively high, ranging from $15 to $20 per ton. Although the manufactured ice was crude and often very poor, the cost of production was excessive, owing to the experimental nature of the process, the imperfect knowledge of the operators, and the loss of ammonia by leakage. These circumstances combined with the excessive price of natural ice to keep the price for manufactured ice correspondingly high. In 1880 the average capital per establishment decreased to $35,749 and the average value of products to $15,565. The decade between 1870 and 1880 may be looked upon as the incipient and experimental stage of the industry. A number of small-capacity plants were installed, usually in Southern towns of considerable population, where the manufactured product would have to compete with natural ice only to a very limited extent. In this way a demand for ice was created and supplied. In many instances the surplus was sent to neighboring communities, and led generally to the establishment of plants in these localities also. Later the industry gained a foothold in the cities where natural ice was used to some extent by the wealthy families and by a few of the larger dealers in perishable products.

The decade from 1880 to 1890 witnessed a rapid growth in the industry and demonstrated that it was possible to manufacture ice on a scale commensurate with the needs of the community in which the plant was located. Thus the industry became firmly estab-

lished. Small establishments began to increase their capacity and to install larger refrigerating machines. The average capital per establishment increased to $44,353, or 24.1 per cent, and the value of products to $22,077, or 41.8 per cent. The decade from 1890 to 1900 witnessed a still further increase in the productive capacity, resulting in an increase in the average capital per establishment to $48,544, or 9.5 per cent. There was a decrease, however, in the average value of products from $22,077 to $17,630, or $4,447 per establishment, caused, in part at least, by a decrease in price to the consumer, which resulted from the general reduction in the cost of production, due to the increasing knowledge of refrigerants and refrigerating processes.

The corporate form of organization predominates in this industry. Of the total number of establishments reporting, 475, or 60.4 per cent, were operated by incorporated companies. Of the remainder, 179, or 22.7 per cent, were conducted by individuals, and 133, or 16.9 per cent, by firms or limited partnerships.

Table 3 presents, by states and territories, the number of ice-manufacturing establishments as returned at the censuses of 1870 to 1900, inclusive, together with the increase during the decade.

TABLE 3.—COMPARATIVE SUMMARY, NUMBER OF ACTIVE ESTABLISHMENTS, 1870 TO 1900, INCLUSIVE; AND THE INCREASE, 1890 TO 1900, BY STATES AND TERRITORIES, ARRANGED GEOGRAPHICALLY.

STATES AND TERRITORIES.	1900	1890	1880	1870	Increase, 1890 to 1900.
The United States	787	222	35	4	565
New England states	7	.....	.....	.....	7
Rhode Island	2	.....	.....	.....	2
Connecticut	5	.....	.....	.....	5
Middle states	169	14	.....	.....	155
New York	41	1	.....	.....	40
New Jersey	26	1	.....	.....	25
Pennsylvania	73	5	.....	.....	68
Delaware	7	1	.....	.....	6
Maryland	18	5	.....	.....	13
District of Columbia	4	1	.....	.....	3
Southern states	386	165	29	4	221
West Virginia	8	4	.....	.....	4
Virginia	30	8	.....	.....	22
North Carolina	23	5	.....	.....	18
South Carolina	13	4	.....	.....	9
Georgia	32	16	8	.....	16
Florida	35	9	.....	.....	26
Kentucky	31	12	1	.....	19
Tennessee	27	13	.....	1	14
Alabama	23	18	3	.....	5
Mississippi	23	8	.....	.....	15
Arkansas	18	5	1	.....	13
Louisiana	36	10	4	2	26
Indian Territory	3	.....	.....	.....	3
Oklahoma	7	.....	.....	.....	7
Texas	77	53	12	1	24
Central states	152	23	1	.....	129
Ohio	42	10	.....	.....	32
Indiana	47	3	.....	.....	44
Illinois	29	8	.....	.....	21
Iowa	3	.....	.....	.....	3
Missouri	31	2	1	.....	29
Western states	40	7	.....	.....	33
Nebraska	1	.....	.....	.....	1
Utah	1	.....	.....	.....	1

TABLE 3.—COMPARATIVE SUMMARY, NUMBER OF ACTIVE ESTABLISHMENTS, 1870 TO 1900, INCLUSIVE; AND THE INCREASE, 1890 TO 1900, BY STATES AND TERRITORIES, ARRANGED GEOGRAPHICALLY—Continued.

STATES AND TERRITORIES.	1900	1890	1880	1870	Increase, 1890 to 1900.
Western states—continued.					
Colorado	6	1	.....	.....	5
Kansas	19	4	.....	.....	15
Arizona	9	2	.....	.....	7
New Mexico	4	.....	.....	.....	4
Pacific states	33	13	5	.....	20
Washington	4	2	.....	.....	2
Oregon	9	4	.....	.....	5
California	20	7	5	.....	13

Table 3 indicates in a striking manner the growth of the industry since 1870. In 1870 all 4 of the establishments reporting were located in the Southern states, and the same is true of nearly all of the 35 plants returned at the census of 1880. From 1880 to 1890 the number of establishments increased rapidly and the industry extended to the Middle, Central, Western, and Pacific states, supplementing the supply of ice furnished by nature. Although, between 1890 and 1900, the number of establishments increased remarkably throughout the South, the greatest and most striking increases occurred in a few of the Middle and Central states, namely, Pennsylvania, Indiana, New York, and Ohio. In 1890 Ohio was the only one of these states which reported as many as 10 ice plants, and the number in each of the other states, with the exception of Pennsylvania, was under 5. At the present census not one of these states reported less than 40 ice-manufacturing plants, and in Pennsylvania the number reached 73. This remarkable growth of the industry in the North is largely accounted for by the fact that the process of manufacture, through the perfection of the refrigerating machines, the mechanical appliances used, and the general economy of the plant, has reached a point where the manufactured product can be produced at a cost which makes it possible to compete successfully with the natural product.

It is interesting to compare the number of establishments in the Southern states with the total number in the United States for 1890 and 1900. These 15 states comprise a little less than one-third of the 52 states and territories of the United States, and the comparison shows the growth of the industry in the North and West. In 1890, 165, or 74.3 per cent of the total number, were located in the South. In 1900 the number in the South increased to 386, an increase of 133.9 per cent, but formed only 49 per cent of the total number of establishments.

In no state or territory has there been a decrease in the number of establishments. The increase in the total number from 1890 to 1900 was one hundred and

forty-one times the total number reported for 1870, over sixteen times that returned for 1880, and over two and one-half times that reported for 1890. The leading 10 states in 1900, ranked according to the number of establishments, were: Texas, 77; Pennsylvania, 73; Indiana, 47; Ohio, 42; New York, 41; Louisiana, 36; Florida, 35; Georgia, 32; Missouri, 31; and Kentucky, 31. The following states reported no ice-manufacturing establishments: Idaho, Maine, Massachusetts, Michigan, Minnesota, Montana, Nevada, New Hampshire, North Dakota, South Dakota, Vermont, Wisconsin, and Wyoming.

In the manufacture of ice there are two systems used, commonly known as the "compressor" and the "absorption" systems. The compressor system, which is by far the more common of the two, involves three successive steps, respectively called compression, condensation, and expansion. In this system anhydrous ammonia, or ammonia which contains no water, in the gaseous form is subjected to a pressure of from 125 to 175 pounds per square inch, by the use of a pump employing steam or other power. At the beginning the gas contains a certain amount of heat, and substantially none of this is lost by compression. The gas is next reduced to the liquid state by condensation. This is performed by passing the ammonia through coils of pipe, the pipes being in contact with cold water or some other cooling medium. The excess of heat is thus given up, and the ammonia, reduced to the liquid state, is then caused to expand or become gaseous in coils of pipe which are in contact with the water to be frozen. This reduces the temperature of the ammonia gas below the freezing point of water, and the ammonia absorbs from the water to be cooled the heat which was taken from the former during condensation. This of necessity results in the freezing of water, owing to the well-known fact that if two substances of different temperatures are allowed to come in contact with each other, the warmer body will impart its heat to the colder, until the temperatures of the two are equalized. This is the theory of all refrigerating processes. The ammonia, having completed its cooling work, is then returned to the compressor where it may be reused repeatedly. There is, however, a small loss during each cycle of operations, and the supply must be replenished at intervals.

In the absorption system an aqueous solution of ammonia is used, the process involving four successive steps: the generation of gas, condensation, expansion, and absorption. The application of heat to the aqua ammonia converts it into a gas, and raises the pressure to from 120 to 160 pounds per square inch. The ammonia is then condensed, or reduced to liquid form by being conducted through pipes which are in contact with cold water. The next step is the expansion, which is usually accomplished as in the compressor system. The ammonia is now changed from a liquid to a gas, and, being greatly reduced in temperature, absorbs heat from the pipes, thus producing ice or refrigeration.[1]

Table 4 presents, by states and territories, the number of establishments in 1900 using the compressor and the absorption systems, and the per cent of each to the total number.

TABLE 4.—NUMBER OF ESTABLISHMENTS USING THE COMPRESSOR AND THE ABSORPTION SYSTEMS, AND THE PER CENT OF EACH TO THE TOTAL NUMBER, BY STATES AND TERRITORIES; ARRANGED GEOGRAPHICALLY: 1900.

STATES AND TERRITORIES.	Total number of establishments.	COMPRESSOR SYSTEM.		ABSORPTION SYSTEM.	
		Number.	Per cent of total.	Number.	Per cent of total.
The United States	787	571	72.6	216	27.4
New England states	7	7	100.0	.....	.....
Rhode Island	2	2	100.0	.....	.....
Connecticut	5	5	100.0	.....	.....
Middle states	169	158	93.5	11	6.5
New York	41	37	90.2	4	9.8
New Jersey	26	24	92.3	2	7.7
Pennsylvania	73	68	93.1	5	6.9
Delaware	7	7	100.0	.....	.....
Maryland	18	18	100.0	.....	.....
District of Columbia	4	4	100.0	.....	.....
Southern states	386	247	64.0	139	36.0
West Virginia	8	4	50.0	4	50.0
Virginia	30	22	73.3	8	26.7
North Carolina	23	19	82.6	4	17.4
South Carolina	13	7	53.9	6	46.1
Georgia	32	16	50.0	16	50.0
Florida	35	14	40.0	21	60.0
Kentucky	31	12	38.7	19	61.3
Tennessee	27	22	81.5	5	18.5
Alabama	23	14	60.9	9	39.1
Mississippi	23	13	56.5	10	43.5
Arkansas	18	18	100.0	.....	.....
Louisiana	36	13	36.1	23	63.9
Indian Territory	3	3	100.0	.....	.....
Oklahoma	7	5	71.4	2	28.6
Texas	77	65	84.4	12	15.6
Central states	152	105	69.1	47	30.9
Ohio	42	30	71.4	12	28.6
Indiana	47	25	53.2	22	46.8
Illinois	29	20	69.0	9	31.0
Iowa	3	2	66.7	1	33.3
Missouri	31	28	90.3	3	9.7
Western states	40	25	62.5	15	37.5
Nebraska	1	1	100.0	.....	.....
Utah	1	1	100.0	.....	.....
Colorado	6	2	33.3	4	66.7
Kansas	19	10	52.6	9	47.4
Arizona	9	9	100.0	.....	.....
New Mexico	4	2	50.0	2	50.0
Pacific states	33	29	87.9	4	12.1
Washington	4	4	100.0	.....	.....
Oregon	9	9	100.0	.....	.....
California	20	16	80.0	4	20.0

From Table 4 it appears that of the 787 establishments reporting, 571, or 72.6 per cent, used the compressor system, and the remainder, 216, or 27.4 per cent, employed the absorption system. These figures show that the compressor system is the one in general use. It is in fact superseding the absorption, which is the older of the two processes. The latter, however, is still used in the smaller plants and warm climates, as its

[1] Artificial Ice Making and Refrigeration, by Louis M. Schmidt, pages 5-8.

operation requires less machinery and a less complicated arrangement of appliances. In three of the Southern states—Florida, Kentucky, and Louisiana—the number of establishments using the absorption system exceeded the number employing the compressor system. In West Virginia, Georgia, and New Mexico the number employing each system was the same, but in the majority of the remaining states, with the single exception of Colorado, the number using the compressor system was far in excess of the number employing the other system. It will also be noticed that a number of states reported no establishments using absorption machines. The following states reported plants using both systems: Colorado, 1; Kansas, 1; Kentucky, 2; Louisiana, 1; Mississippi, 1; Missouri, 1; Tennessee, 2. These latter establishments were classified according to the number or capacity of the compressor or absorption machines used.

Table 5 is a comparative summary of capital for 1890 and 1900, with the per cent of each item to the total, and the per cent of increase for the decade.

TABLE 5.—COMPARATIVE SUMMARY, CAPITAL: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	$38,204,054	100.0	$9,846,468	100.0	288.0
Land	4,679,379	12.3	1,595,360	16.2	193.3
Buildings	7,387,014	19.3	1,338,652	13.6	451.8
Machinery, tools, and implements	22,852,158	59.8	5,939,719	60.3	284.7
Cash and sundries	3,285,503	8.6	972,737	9.9	237.8

As shown by Table 5, the increase between 1890 and 1900 in the total capital employed in the manufacture of ice was $28,357,586, or 288 per cent. Of the total value of capital reported, the value of machinery, tools, and implements, including refrigerating apparatus and machinery, boilers, tanks, air compressors, small engines, pipe coils, ice receptacles, and all other apparatus and accessories required, constituted the principal item both in 1890 and 1900, amounting to $5,939,719 in 1890 and $22,852,158 in 1900, an increase of $16,912,439, or 284.7 per cent. The per cent of this item to the total capital was substantially the same for each year. The value of buildings, the next largest item, increased from $1,338,652 to $7,387,014 during the decade, an increase of $6,048,362, or 451.8 per cent. The value of land increased from $1,595,360 to $4,679,379, an increase of $3,084,019, or 193.3 per cent. It constituted, however, a smaller proportion of the total capital in 1900 than in 1890. The value of buildings, on the other hand, not only exhibited a striking increase, but constituted a larger proportion of the capital in 1900 than in 1890. This increase was probably due to the erection of cold-storage plants operated in connection with the manufacture of ice, to the increase in the ice-storage capacity, and to the generally increased productive capacity of the plants. Cash and sundries, including cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries formed the smallest item of the total capital, amounting to $972,737 in 1890, and to $3,285,503 in 1900, an increase of $2,312,766, or 237.8 per cent, and constituted 8.6 per cent of the total capital in 1900, or nearly the same per cent as in 1890. The above figures do not represent the capital stock of any of the corporations, but include only the actual value of the plants, together with the amount necessary for working capital.

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

TABLE 6.—MISCELLANEOUS EXPENSES: 1900.

	Amount.	Per cent of total.
Total	$1,779,890	100.0
Rent of works	116,026	6.5
Taxes, not including internal revenue	246,340	13.9
Rent of offices, insurance, interest, repairs, advertising, and other sundries	1,394,180	78.3
Contract work	23,344	1.3

The amount paid for rent of offices, insurance, interest, internal-revenue tax and stamps, repairs of buildings and machinery, advertising, and all other sundries not reported under the head of materials, etc., was the principal item, and constituted 78.3 per cent of the total miscellaneous expenses. This amount does not include expenditures for new equipment, machinery, and other apparatus. The amount of interest in this item does not include the interest paid on bonds by incorporated companies, but only the small sums expended during the year for money or credit necessary to conduct the business. The remaining items under miscellaneous expenses formed but a relatively small per cent of the total amount reported.

Table 7 shows the cost of the different materials used in the manufacture of ice in 1900, with the per cent of each item to the total cost of materials.

TABLE 7.—COST OF MATERIALS USED: 1900.

	Amount.	Per cent of total.
Total	$3,339,724	100.0
Ammonia	359,549	10.8
Anhydrous	279,680	8.4
Aqua	79,869	2.4
All other materials	501,485	15.0
Fuel	2,144,316	64.2
Rent of power and heat	20,336	0.6
Mill supplies	216,383	6.5
Freight	97,654	2.9

The total cost of materials in 1900 was $3,339,724 as compared with $940,699 in 1890, an increase of $2,399,025, or 255 per cent. The quantities and values of the different materials used are presented in detail in Table 11, by states and territories.

The manufacture of ice is peculiar in that practically the only materials which affect the cost are those which do not enter into the product, but are used in the generation of the cold necessary for the production of ice. The principal item of expense is the cost of fuel used to propel the machinery. In 1900 this was $2,144,316, or 64.2 per cent of the total cost. No attempt was made to ascertain the number of tons of coal represented by this amount. Ammonia, anhydrous and aqua, is the principal material used as a refrigerant. The cost of ammonia was $359,549, or only 10.8 per cent of the total cost of materials used. The cost of anhydrous ammonia was $279,680, or 8.4 per cent of the total cost of materials, and the cost of aqua ammonia was $79,869, or 2.4 per cent of the total cost of materials.

The item "other materials" included the amounts expended for brine, made either with sodium chloride (common salt) or chloride of calcium, and also the amount expended for water consumed, and constituted the remainder of the materials used directly in connection with the production of ice, the common salt and the chloride of calcium assisting in refrigeration, and the water entering into the product. The quantities of sodium chloride, chloride of calcium, and water were not ascertained and the cost of each was not given separately. Included also with "other materials" is the cost of anhydrous sulphurous dioxide and ether, which are used to some extent as refrigerants in place of ammonia in the Pictet machine, so called from its inventor, Professor Pictet, of Geneva, Switzerland. There were 7 establishments using anhydrous sulphurous dioxide, distributed as follows: California, 1; Kentucky, 3; New Jersey, 1; Pennsylvania, 1; Texas, 1. There was only 1 establishment using ether. The total quantity of anhydrous sulphurous dioxide used was 13,870 pounds, costing $2,540, an average of 18.3 cents per pound. The cost of ether was given as $350. A combination of these amounts with the sum expended for ammonia shows that the total amount expended for refrigerants was $362,089, or 10.8 per cent of the total amount expended for materials used in the manufacture of ice.

As stated above, the ammonia used in artificial refrigeration is of two kinds, anhydrous and aqua. In the compressor machines, anhydrous ammonia is used exclusively, but in the absorption machines both aqua and anhydrous ammonia are used. Table 8 shows, by states and territories, the quantity and cost of each variety of ammonia used in 1900, including the anhydrous ammonia used in the compressor system, and the anhydrous and aqua ammonia used in the absorption system, with the average cost of each per pound.

TABLE 8.—QUANTITY AND COST OF AMMONIA USED; QUANTITY, COST, AND AVERAGE COST PER POUND OF ANHYDROUS AMMONIA USED IN THE COMPRESSOR SYSTEM; AND QUANTITY, COST, AND AVERAGE COST PER POUND OF ANHYDROUS AND OF AQUA AMMONIA USED IN THE ABSORPTION SYSTEM; BY STATES AND TERRITORIES; ARRANGED GEOGRAPHICALLY: 1900.

STATES AND TERRITORIES.	AMMONIA USED.										
	Total.		Compressor system.			Absorption system.					
			Anhydrous.			Anhydrous.			Aqua.		
	Pounds.	Cost.	Pounds.	Cost.	Average cost per pound (cents).	Pounds.	Cost.	Average cost per pound (cents).	Pounds.	Cost.	Average cost per pound (cents).
United States	2,379,989	$359,549	946,666	$249,838	26.4	109,869	$29,842	27.1	1,323,454	$79,869	6.0
New England states	7,113	1,831	7,113	1,831	25.7						
Rhode Island	1,800	460	1,800	460	25.6						
Connecticut	5,313	1,371	5,313	1,371	25.8						
Middle states	400,013	88,108	328,285	81,910	25.0	9,386	2,384	25.4	62,342	3,814	6.1
New York	102,629	23,274	89,129	21,726	24.4	4,000	1,048	26.2	9,500	500	5.3
New Jersey	33,593	6,876	25,693	6,255	24.3	1,000	230	23.0	6,900	391	5.7
Pennsylvania	225,936	48,887	175,608	44,858	25.5	4,386	1,106	25.2	45,942	2,923	6.4
Delaware	6,030	1,580	6,030	1,580	26.2						
Maryland	22,515	5,177	22,515	5,177	23.0						
District of Columbia	9,310	2,314	9,310	2,314	24.9						
Southern states	1,270,026	164,931	333,020	93,562	28.1	66,105	17,893	27.1	870,901	53,476	6.1
West Virginia	74,870	5,573	4,100	975	23.8	3,075	727	23.6	67,695	3,871	5.7
Virginia	88,607	12,928	28,137	8,334	29.6	4,974	1,310	26.5	55,496	3,278	5.9
North Carolina	44,418	6,143	16,338	4,415	27.0	410	115	28.0	27,670	1,613	5.8
South Carolina	58,333	4,439	3,277	857	26.0	336	84	25.0	54,720	3,498	6.4
Georgia	107,925	12,736	26,090	6,778	26.0	3,858	986	25.6	77,977	4,977	6.4
Florida	149,086	13,276	17,881	5,174	29.0	1,905	576	30.2	129,350	7,526	5.8
Kentucky	99,007	12,006	23,527	6,612	28.1	5,980	1,691	28.3	69,500	3,703	5.3
Tennessee	88,573	13,685	26,649	7,478	26.1	12,757	3,438	26.9	47,167	2,769	5.9
Alabama	122,415	12,766	24,989	6,745	27.0				97,426	6,021	6.2
Mississippi	44,115	6,489	10,216	2,541	24.9	8,973	2,330	26.0	24,926	1,618	6.5
Arkansas	20,984	5,910	20,984	5,910	28.2						
Louisiana	191,178	24,424	32,807	9,222	28.1	20,819	5,825	28.0	137,552	9,377	6.8
Indian Territory	1,550	443	1,550	443	28.6						
Oklahoma	10,328	1,833	2,530	733	29.0	2,312	600	26.0	5,486	500	9.1
Texas	168,637	32,280	91,995	27,350	29.7	706	205	29.0	75,936	4,725	6.2
Central states	508,384	69,429	207,754	49,582	23.9	17,335	4,381	25.3	283,295	15,466	5.5
Ohio	141,365	14,756	39,096	9,617	24.6	955	234	24.5	101,314	4,905	4.8
Indiana	144,476	15,809	28,017	7,717	27.5	8,862	2,276	25.7	107,597	5,816	5.4
Illinois	74,829	14,813	49,256	12,324	25.0	5,140	1,350	26.3	20,433	1,139	5.6
Iowa	24,600	1,749	2,100	549	26.1				22,500	1,200	5.3
Missouri	123,114	22,302	89,285	19,375	21.7	2,378	521	21.9	31,451	2,406	7.6
Western states	113,874	17,798	32,915	10,401	31.6	9,043	2,784	30.8	71,916	4,613	6.4
Nebraska	1,035	300	1,035	300	29.0						
Utah	600	210	600	210	35.0						
Colorado	44,264	5,564	5,646	1,714	30.4	5,389	1,693	31.4	33,229	2,157	6.5
Kansas	42,938	5,891	13,019	3,434	26.4	3,354	1,001	29.8	26,565	1,456	5.5
Arizona	10,279	4,133	10,279	4,133	40.2						
New Mexico	14,758	1,700	2,336	610	26.1	300	90	30.0	12,122	1,000	8.2
Pacific states	80,579	17,452	37,579	12,552	33.4	8,000	2,400	30.0	35,000	2,500	7.1
Washington	6,888	2,605	6,888	2,605	37.8						
Oregon	6,043	1,934	6,043	1,934	32.0						
California	67,653	12,913	24,653	8,013	32.5	8,000	2,400	30.0	35,000	2,500	7.1

The total cost of ammonia is given as $359,549 and the total number of pounds as 2,379,989. The cost of the anhydrous ammonia used in the compressor system was $249,838 and the number of pounds 946,666, or 39.8 per cent of the total number of pounds of ammonia reported for both systems. The average cost was 26.4 cents per pound. The cost of anhydrous ammonia used in the absorption system was 27.1 cents per pound. The total cost of the aqua ammonia used was $79,869, an average of 6 cents per pound, and the number of pounds was 1,323,454, or 55.6 per cent of the total. The average price for anhydrous and aqua ammonia was secured from the totals of the whole number of establishments from which reports were received, and therefore does not indicate the price in any one state or section of the country. The cost and also the quantity used vary considerably in different sections of the country. Furthermore, ammonia is sometimes bought delivered, and it was found impracticable to attempt to separate the amount chargeable to freight. The table, however, reflects in a general way the variations in the price of ammonia in different sections of the country. It appears that the average cost of anhydrous ammonia varied from 22 cents to 40 cents per pound, according to the distance from the source of supply, the average cost being lowest in the Middle and Central states and highest in the Pacific states. The average cost of aqua ammonia varied similarly

from 5 to 9 cents per pound. The quantity of ammonia used depends so much upon its strength and density, upon the type of refrigerating machine used and its condition as to leakage, and also upon the care of the engineers, that an establishment may be obliged to use during one year two to three times the quantity required during the previous year. This statement is necessary in order to obviate erroneous deductions from the figures presented in Table 8.

The total value of products, $13,874,513, as given in Table 1, for 1900, as compared with $4,900,983 for 1890, shows an increase of $8,973,530, or 183.1 per cent, during the past decade. The value of the principal product, ice, amounted to $13,303,874, and formed 95.9 per cent of the total value of product. The value of other products amounted to $570,639, and formed 4.1 per cent of the total value of products. This item includes amounts received for cold storage and for the manufacture of bottled goods and soda water, but the amount received for each was not separately ascertained.

Practically all of the ice manufactured in the United States is produced by the can system or the plate system. In the can system distilled water is used, since if the water were not distilled the ice would be opaque, and, in most cases, of a brownish color. Distilled water is furnished by condensing exhaust steam from the refrigerating machine or by condensing live steam. In the plate system a clear ice is made without distilling the water.

In the can system ice may be formed either in stationary cells or in removable cans, the latter being the method in more general use at the present time. If stationary cells are used, all the cells in an entire tank must be emptied at the same time, which necessitates the use of more than one tank in order to make the operation continuous. In the other method the water to be frozen is placed in cans, which are in turn immersed in iron or wooden tanks containing cold brine. The cans can be taken out singly, and after the ice is removed can be filled again with water and replaced in the tank. Thus the process is continuous. The ice is removed either by dropping the can into, or sprinkling it with tepid water. The time required for the formation of the ice varies from twenty to sixty-six hours, according to the thickness of the mold containing the water to be frozen and the temperature of the brine.

The following table indicates the weight of blocks, size of can, and the time required for freezing:

STANDARD ICE CANS OR MOLDS.[1]

WEIGHT OF BLOCKS.	Size of can.	Time of freezing (with 18° brine).
Pounds.	Inches.	Hours.
50	6 x 12 x 26	20
100	8 x 16 x 32	36
150	8 x 16 x 42	36
200	11 x 22 x 32	60
300	11 x 22 x 44	60
400	11 x 22 x 57	60

[1] Mechanical Refrigeration and Ice Making, the De La Vergne Refrigerating Machine Company.

In the plate system a hollow iron plate is immersed in a tank containing the water to be frozen, and as the plate contains coils for the freezing medium or is filled with brine, the ice is formed on the two outer surfaces. It may be loosened in several ways, according to the system of refrigeration used. The production of ice by the plate system is much slower than by the can system, and for this reason the use of several plates is necessary for a continuous process. The ice cake may be of several sizes, the standard being 16 feet long, 8 feet wide, and 11 inches thick. This system is used chiefly in connection with electric power where the conditions are such that the cost compares favorably with the cost of steam power.

Table 9 shows, by states and territories, the quantity and value of can ice and of plate ice in 1900, with the average value per ton of each, and the per cent which the production of each variety in each state was of the total production of that variety in the United States. Table 9 also includes the returns for one establishment engaged in the manufacture of spray ice—that is, the water is sprayed on pipes and frozen in that manner. The product of this establishment is included in the totals for can ice.

TABLE 9.—QUANTITY AND VALUE OF ICE MANUFACTURED; THE NUMBER OF TONS OF CAN AND OF PLATE ICE THE AVERAGE VALUE OF EACH PER TON; AND THE PER CENT WHICH EACH FORMS OF THE TOTAL; BY STATES AND TERRITORIES; ARRANGED GEOGRAPHICALLY: 1900.

STATES AND TERRITORIES.	TOTAL.		CAN.				PLATE.			
	Tons.	Value.	Tons.		Value.	Average value per ton.	Tons.		Value.	Average value per ton.
			Number.	Per cent of total.			Number.	Per cent of total.		
United States	4,294,439	$13,303,874	4,139,764	96.4	$12,863,160	$3.11	154,675	3.6	$440,714	$2.85
New England states	40,059	131,376	31,650	79.0	99,804	3.15	8,409	21.0	31,572	3.75
Rhode Island	14,109	36,072	10,000	70.9	26,000	2.60	4,109	29.1	10,072	2.45
Connecticut	25,950	95,304	21,650	83.4	73,804	3.41	4,300	16.6	21,500	5.00
Middle states	1,574,980	3,983,498	1,480,988	94.0	3,737,962	2.52	93,992	6.0	245,536	2.61
New York	457,779	1,025,308	456,279	99.7	1,015,308	2.23	1,500	0.3	10,000	6.66
New Jersey	169,755	379,776	154,615	91.1	341,176	2.21	15,140	8.9	38,600	2.55
Pennsylvania	735,018	2,000,931	684,144	93.1	1,866,770	2.73	50,874	6.9	134,161	2.64
Delaware	26,738	71,240	24,700	92.4	61,050	2.47	2,038	7.6	10,190	5.00
Maryland	120,740	358,668	116,800	96.7	348,083	2.98	3,940	3.3	10,585	2.69
District of Columbia	64,950	147,575	44,450	68.4	105,575	2.38	20,500	31.6	42,000	2.05
Southern states	1,414,158	5,291,523	1,389,601	98.3	5,225,913	3.76	24,557	1.7	65,610	2.67
West Virginia	35,734	119,201	35,734	100.0	119,201	3.34				
Virginia	118,240	417,052	96,458	81.6	362,542	3.76	21,782	18.4	54,510	2.50
North Carolina	61,338	228,305	61,338	100.0	228,305	3.72				
South Carolina	45,228	116,357	44,853	99.2	114,857	2.56	375	0.8	1,500	4.00
Georgia	131,236	455,699	131,236	100.0	455,699	3.47				
Florida	125,184	437,382	125,184	100.0	437,382	3.49				
Kentucky	137,472	375,897	137,472	100.0	375,897	2.73				
Tennessee	158,931	538,107	158,931	100.0	538,107	3.39				
Alabama	55,908	252,675	55,908	100.0	252,675	4.52				
Mississippi	57,207	268,175	57,207	100.0	268,175	4.69				
Arkansas	51,236	225,029	51,236	100.0	225,029	4.39				
Louisiana	179,716	563,561	179,716	100.0	563,561	3.14				
Indian Territory	3,060	19,440	3,060	100.0	19,440	6.35				
Oklahoma	22,218	106,003	22,218	100.0	106,003	4.77				
Texas	231,460	1,168,640	229,050	99.0	1,159,040	5.06	2,400	1.0	9,600	4.00
Central states	986,043	2,640,850	968,326	98.2	2,604,354	2.69	17,717	1.8	36,496	2.06
Ohio	237,750	577,038	220,833	92.9	548,542	2.48	16,917	7.1	28,496	1.68
Indiana	199,184	514,531	199,184	100.0	514,531	2.58				
Illinois	249,813	877,178	249,013	99.7	869,178	3.49	800	0.3	8,000	10.00
Iowa	13,500	36,600	13,500	100.0	36,600	2.71				
Missouri	285,796	635,503	285,796	100.0	635,503	2.22				
Western states	154,055	642,379	154,055	100.0	642,379	4.17				
Nebraska	5,400	15,000	5,400	100.0	15,000	2.78				
Utah	9,000	31,500	9,000	100.0	31,500	3.50				
Colorado	51,545	204,029	51,545	100.0	204,029	3.96				
Kansas	62,486	193,310	62,486	100.0	193,310	3.09				
Arizona	14,709	120,765	14,709	100.0	120,765	8.21				
New Mexico	10,915	77,775	10,915	100.0	77,775	7.13				
Pacific states	125,144	614,248	115,144	92.0	552,748	4.80	10,000	8.0	61,500	6.15
Washington	17,300	103,600	17,300	100.0	103,600	5.99				
Oregon	17,165	95,260	17,165	100.0	95,260	5.55				
California	90,679	415,388	80,679	89.0	353,888	4.39	10,000	11.0	61,500	6.15

The total quantity of ice manufactured in the United States, as returned by the 787 establishments reporting, was 4,294,439 tons, valued at $13,303,874. In addition to this quantity, returns were received from 8 establishments which were engaged primarily in other industries, but which reported the manufacture of ice for sale. These establishments manufactured during the census year 59,206 tons of can ice, valued at $108,259. If these amounts are added to those given in Table 9, the total quantity of ice reported as manufactured for sale in 1900 is shown to be 4,353,645 tons, valued at $13,412,133. This does not represent the total quantity manufactured during the census year, as it is probable that many establishments engaged in the manufacture of ice for sale in connection with other industries failed to state that fact, and reported the value of ice under "all other products." Moreover, as stated above, this total does not include the number of tons produced by companies engaged in other industries but manufacturing ice for their own consumption. Notwithstanding these facts, the number of tons reported may be accepted as fairly representing the quantity of ice manufactured for sale during this period. Of the quantity given in Table 9, 4,139,764 tons, or 96.4 per cent of the total, valued at $12,863,160, was can ice, and 154,675 tons, or 3.6 per cent, valued at $440,714, was plate ice. The average value of can ice was $3.11 per ton and of plate ice $2.85 per ton. In this connection, however, it should be stated that local conditions, cost of production, and the supply of natural ice cause the value of manufactured ice to vary between very wide limits. The average value per ton, as given in

the above table, represents the value at the plant and is computed from the totals of the whole number of establishments from which reports were received. It can not therefore be regarded as the value in any particular section of the country.

It appears from Table 9 that the largest quantity of ice was manufactured in the Middle states, which reported 1,574,980 tons, valued at $3,983,498. The group producing the smallest quantity of ice was the New England states, with 40,059 tons, valued at $131,376. The Southern states, although having nearly one-half of the total number of establishments in the United States, reported a production of only 1,414,158 tons, valued at $5,291,523, or 32.9 per cent of the total quantity produced. This indicates that the plants in the South were, as a rule, smaller than those in other sections of the United States.

The leading state in the manufacture of ice in 1900 was Pennsylvania, with a production of 735,018 tons. New York came next, with 457,779 tons. Missouri ranked third, with 285,796 tons; Illinois fourth, with 249,813 tons; Ohio fifth, with 237,750 tons; Texas sixth, with 231,450 tons; Indiana seventh, with 199,184 tons; Louisiana eighth, with 179,716 tons; New Jersey ninth, with 169,755 tons; and Tennessee tenth, with 158,931 tons. The total quantity of ice produced by these 10 states was 2,905,192 tons, or 67.7 per cent of the total number of tons reported for the United States. The number of tons produced in each of these states is shown in the following diagram:

COMPARATIVE PRODUCTION OF MANUFACTURED ICE IN LEADING TEN STATES: 1900.

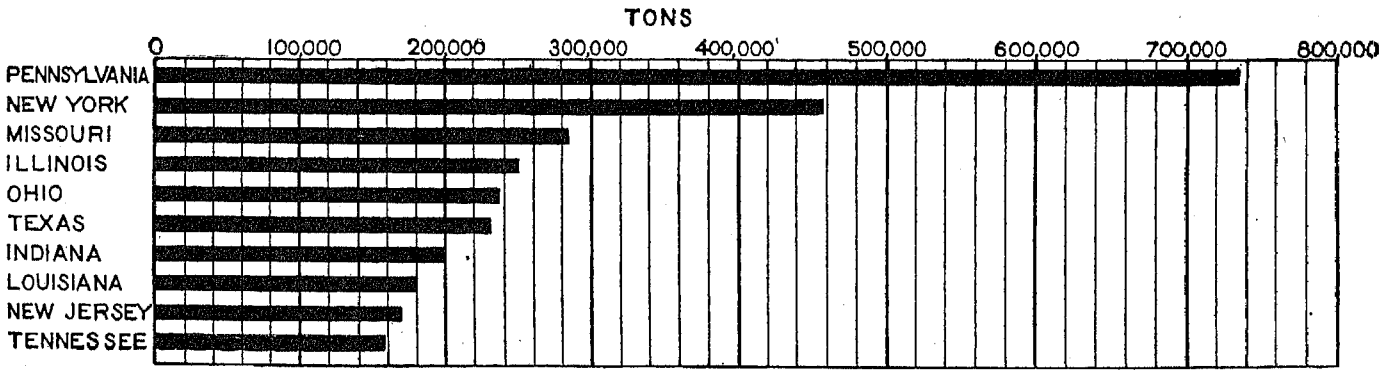


Table 10 presents the statistics of the cities in the United States having a population of over 20,000 in which there were three or more ice-manufacturing establishments in 1900. Estimates of the consumption of natural ice in several of these cities were secured for comparative purposes, but it was found impossible to obtain such information in all cases. In this connection attention is called to the fact that where two or more plants located in the same city or town were controlled by the same corporation, firm, or individual, they were counted as one establishment.

TABLE 10.—STATISTICS OF CITIES OF OVER 20,000 IN POPULATION: 1900.

CITIES.	Rank by number of tons.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	PRODUCTS.			
				Number.	Salaries.	Average number.	Wages.			Total value.	Ice.		All other products, value.
											Tons.	Value.	
Total	.....	281	$25,267,441	910	$801,830	4,055	$2,170,122	$1,279,324	$2,082,224	$8,738,947	3,046,323	$8,334,414	$404,533
New York, N. Y	1	26	2,042,582	45	37,882	256	162,602	160,863	230,507	900,303	410,837	868,239	32,064
Brooklyn borough	.....	10	659,379	18	16,780	82	55,350	38,380	82,057	279,626	135,420	273,626	6,000
Manhattan and Bronx boroughs	.....	8	1,062,767	12	13,020	121	76,317	102,755	116,903	493,510	230,213	467,446	26,064
Richmond and Queens boroughs	.....	8	320,436	15	8,032	53	30,935	19,728	31,547	127,167	45,204	127,167	.....
Philadelphia, Pa	2	20	3,158,914	117	71,435	345	191,465	118,795	204,085	894,592	342,602	894,592	.....
St. Louis, Mo	3	10	1,034,768	28	33,508	129	78,358	47,966	112,419	305,718	180,413	305,718	.....
New Orleans, La	4	10	1,538,230	28	38,180	135	48,610	52,438	116,396	308,683	139,654	308,683	.....
Baltimore, Md	5	5	342,238	4	4,860	63	44,191	12,205	52,499	237,632	86,557	237,632	.....
Memphis, Tenn	6	4	544,572	25	30,770	192	102,881	35,475	45,362	260,000	79,000	260,000	.....
Kansas City, Mo	7	5	207,101	13	12,482	42	29,960	7,217	57,733	138,428	66,350	137,120	1,308
Washington, D. C	8	4	629,992	16	14,310	83	40,603	36,979	61,267	182,575	64,950	147,575	35,000
Newark, N. J	9	4	365,675	10	14,386	62	29,010	19,756	31,275	112,414	61,232	107,598	4,816
Louisville, Ky	10	7	371,821	12	10,140	50	27,372	21,690	35,096	132,395	55,451	118,795	13,600
Norfolk, Va	11	5	439,387	9	7,600	49	25,827	13,530	39,241	115,683	43,975	109,761	5,922
Cleveland, Ohio	12	4	193,654	12	11,020	26	19,203	13,630	30,500	95,100	43,800	95,100	.....
Cincinnati, Ohio	13	5	147,524	8	7,975	37	19,003	11,134	26,133	81,283	40,324	81,283	.....
Nashville, Tenn	14	4	196,284	14	10,616	79	32,690	11,138	27,809	112,277	35,991	112,277	.....
Dallas, Tex	15	3	371,000	52	26,400	68	27,700	14,511	47,275	149,800	32,000	149,800	.....
Indianapolis, Ind	16	7	235,425	11	7,012	67	30,912	12,824	28,387	108,770	31,610	106,775	1,995
San Francisco, Cal	17	3	510,141	30	28,140	50	40,009	21,463	43,753	134,411	31,214	134,411	.....
Atlanta, Ga	18	4	227,238	8	10,100	32	14,946	13,903	30,203	104,913	28,879	104,913	.....
Augusta, Ga	19	3	131,000	8	8,340	37	6,900	9,000	17,800	58,000	24,000	58,000	.....
Camden, N. J	20	3	321,847	3	2,384	17	9,244	7,823	15,499	53,318	23,281	53,318	.....
Evansville, Ind	21	3	291,600	9	7,506	58	26,691	12,678	13,332	76,392	22,719	76,392	.....
Allegheny, Pa	22	4	546,500	8	10,200	70	43,773	13,837	15,380	111,212	21,830	82,400	28,812
Jacksonville, Fla	23	5	159,600	7	6,720	56	27,000	3,720	26,903	87,647	21,609	86,647	1,000
Fort Worth, Tex	24	3	155,500	7	11,400	49	29,800	9,387	20,050	81,000	20,786	81,000	.....
Richmond, Va	25	3	222,500	8	7,680	15	10,800	5,790	14,133	64,932	19,178	59,932	5,000
Little Rock, Ark	26	3	215,713	5	5,400	65	19,400	19,575	12,712	73,234	15,700	73,234	.....
Topeka, Kans	27	3	75,400	6	3,000	16	8,420	3,320	11,000	38,800	14,100	38,800	.....
Portland, Oreg	28	4	106,000	9	13,980	22	15,640	11,685	13,200	91,400	12,600	71,400	20,000
Montgomery, Ala	29	3	40,700	2	1,200	8	3,945	1,190	2,020	20,325	3,935	20,325	.....
All other cities[1]	.....	114	10,395,535	396	347,254	1,877	1,003,167	555,902	700,255	3,607,710	1,071,746	3,352,694	255,016

[1] Includes establishments distributed as follows: Akron, Ohio, 1; Allentown, Pa., 1; Altoona, Pa., 2; Anderson, Ind., 1; Aurora, Ill., 1; Austin, Tex., 2; Birmingham, Ala., 2; Bloomington, Ill., 1; Bridgeport, Conn., 1; Buffalo, N. Y., 2; Canton, Ohio, 1; Charleston, S. C., 2; Chattanooga, Tenn., 2; Chester, Pa., 1; Chicago, Ill., 2; Columbia, S. C., 1; Columbus, Ohio, 2; Covington, Ky., 1; Davenport, Iowa, 1; Dayton, Ohio, 1; Decatur, Ill., 1; Denver, Colo., 2; Des Moines, Iowa, 1; Easton, Pa., 1; East St. Louis, Ill., 1; Elizabeth, N. J., 1; Elmira, N. Y., 1; Erie, Pa., 1; Fort Wayne, Ind., 1; Galveston, Tex., 2; Harrisburg, Pa., 1; Houston, Tex., 1; Johnstown, Pa., 1; Joliet, Ill., 1; Knoxville, Tenn., 2; Lancaster, Pa., 1; Leavenworth, Kans., 1; Lexington, Ky., 2; Lincoln, Nebr., 1; Los Angeles, Cal., 2; McKeesport, Pa., 1; Macon, Ga., 1; Mobile, Ala., 2; Muncie, Ind., 1; New Albany, Ind., 2; New Britain, Conn., 1; Newburg, N. Y., 1; Newcastle, Pa., 1; New Haven, Conn., 1; Newport, Ky., 1; Norristown, Pa., 2; Paterson, N. J., 1; Peoria, Ill., 1; Petersburg, Va., 2; Pittsburg, Pa., 2; Pueblo, Colo., 1; Quincy, Ill., 1; Reading, Pa., 2; Roanoke, Va., 2; St. Joseph, Mo., 1; Salt Lake City, Utah, 1; San Antonio, Tex., 2; Savannah, Ga., 2; Scranton, Pa., 1; Seattle, Wash., 2; Shenandoah, Pa., 1; Sioux City, Iowa, 1; Springfield, Ill., 1; Springfield, Mo., 1; Springfield, Ohio, 1; South Bend, Ind., 1; Tacoma, Wash., 1; Terre Haute, Ind., 1; Trenton, N. J., 1; Waco, Tex., 2; Wheeling, W. Va., 2; Wichita, Kans., 2; Wilkesbarre, Pa., 1; Williamsport, Pa., 1; Wilmington, Del., 2; Wilmington, N. C., 2; Yonkers, N. Y., 1; York, Pa., 2; Youngstown, Ohio, 1; Zanesville, Ohio, 1.

Table 10 indicates that New York city led in the manufacture of ice, having reported 26 establishments and 410,837 tons of ice valued at $868,239, an average of 15,801 tons per establishment, and an average value of $2.11 per ton.

Efforts were made to get estimates of the consumption of natural ice in each of the cities included in Table 10. In all cases except New York and Philadelphia the results were, however, too unreliable to be included in this report. In New York it was estimated that the annual consumption of ice is about 5,000,000 tons.[1] If these figures are approximately correct, the manufactured ice consumed during the census year formed 8.2 per cent of the total consumption. Correspondence with several of the leading ice manufacturers indicates that the average cost of production of manufactured ice was approximately $1.50 per ton and the average wholesale price $2 per ton, and that the average retail price varied from 15 to 30 cents per 100 pounds, according to the season of the year. In Philadelphia the annual consumption of ice was estimated at from 1,000,000 to 1,600,000 tons,[2] 342,602 tons of which was represented by the local production of manufactured ice. The average cost of production was approximately $2 per ton, the average wholesale price $2.25 per ton, and the average retail price ranged from 20 to 40 cents per 100 pounds, according to the season of the year. In San Francisco from 10,000 to 15,000 tons of natural ice were used, brought from the Sierra Nevada Mountains, but, owing to climatic conditions, the consumption of ice in this city is much smaller than in Eastern cities of the same size. No statistics are available for the remaining cities relative to the consumption of natural ice or to the average cost of production per ton of manufactured ice. In New Orleans, Memphis, Norfolk, Nashville, Dallas, Atlanta, Augusta, Jacksonville, Fort Worth,

[1] Ice and Refrigeration, December, 1901, p. 243.

[2] Ice and Refrigeration, December, 1901, p. 243.

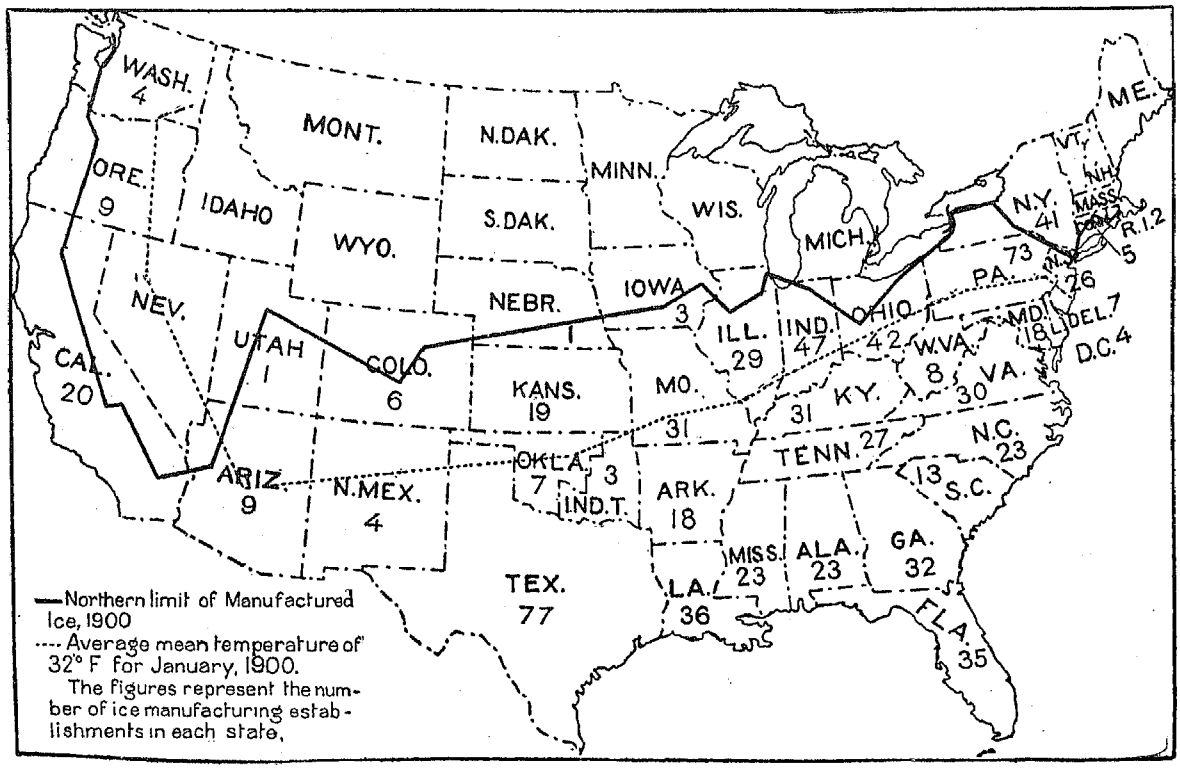
Little Rock, Montgomery, Austin, Birmingham, Charleston, Chattanooga, Columbia, Galveston, Houston, Knoxville, Macon, Mobile, San Antonio, Savannah, Waco, and Wilmington, N. C., manufacturers reported that no natural ice was sold during the census year, the entire quantity consumed being manufactured.

The development of the ice manufacture has naturally had a very close relation to the possibility of procuring natural ice, and there has always been considerable competition between the two products. This is illustrated by the development of the industry in the South. The situation in 1880 is described in the report on the Tenth Census as follows: "For fifteen years efforts have been made to reduce the cost of ice in the South and render her, in a measure, independent of outside sources of supply. Tennessee and Georgia have imported extensively from the Ohio River region by rail. The lower Mississippi has bought in the St. Louis region and Texas has imported by rail. Enterprise has, however, been chiefly in the direction of the manufacture of artificial ice. * * * The cost of production has been reduced to about $5 per ton in most places, which is a trifle below the rate at which ice can be delivered in Tennessee and Georgia by rail from the Ohio River, and considerably below the cost of the article from Maine, delivered in inland Southern towns. With this advantage in its favor, the business of manufacture is steadily growing at all points at a distance from the seacoast. The prospect is fair that they will soon be independent of outside sources of supply, although it will be many years before the cost to small consumers will fall anywhere nearly as low as in the North. On the seacoast Northern ice still has the preference. It can be landed more cheaply than the local article can be made, and by purchasing in Maine or Massachusetts the dealers avoid the heavy risks of experimenting with expensive plants and imperfect methods of manufacture. The solitary exception is the city of New Orleans, which, though still buying Northern ice, is nevertheless manufacturing on an extensive scale."

The above statement is interesting in connection with the status of the manufactured-ice industry in Southern cities at the present time. Correspondence with men prominently identified with the ice industry in the South developed the fact that during the year 1900, with the possible exception of a few coast cities, the South depended entirely for her ice supply upon the manufactured product. In the large Southern cities it was stated that the cost of production was approximately $2 per ton. In the smaller cities and towns, although the cost is in excess of that figure, it is so much reduced that they are now independent of outside sources of supply.

The United States may therefore be divided into three divisions or zones: A southern zone, where the expense of procuring natural ice gave manufactured ice a complete monopoly; a middle zone, where both natural and manufactured ice were sold in competition with each other; and a northern zone, where the low cost of natural ice made its monopoly complete. The southern zone comprises roughly all states south of a line drawn through the northern boundary of North Carolina. The boundary line between the middle and northern zones is indicated by the heavy line upon the accompanying map of the United States.

NORTHERN LIMIT OF MANUFACTURED ICE, 1900.



The most marked change in the industry in recent years has been the exclusion of natural ice from the southern zone and the steadily northward extension of the competitive zone. It is altogether probable that this movement will continue as the cost of production is further reduced. It is stated that under exceptional circumstances ice has been manufactured at as low a cost as 50 or 60 cents per ton. It is probable that at such a cost manufactured ice could compete successfully with the natural product in any part of the country in which there is a demand for ice. The larger plants located in the large cities, during the summer months, when running at full capacity and under favorable conditions, can manufacture ice at from 70 to 90 cents per ton. The average cost for the year, however, will vary from $1.10 to $1.50 per ton. The relation of the present northern limit of ice manufacture to the possibility of obtaining natural ice is shown on the map by the broken line connecting the cities which reported an average temperature of 32° for the month of January, 1900.

HISTORICAL AND DESCRIPTIVE.

The production of cold by artificial means commenced at a much earlier date than is generally supposed. In the warmer climates, especially in the Eastern countries—India, China, and Egypt—where ice and snow were not available, caves, either natural or artificial, were made use of to deposit food and drinks. It was early discovered that porous receptacles would keep the contents cooler than nonporous. In Egypt and East India the vessels containing the water to be frozen were covered with stalks of corn or sugar cane, which was a crude method of artificial refrigeration. A member of the Royal Philosophical Society of England, for some time a resident of the Indies, has described this method of ice making employed in the East, as follows:

> A space of ground of about 4 acres, nearly level, is divided into square plats from 4 to 5 feet wide. The borders are raised by earth taken from the surface of the flat, to about 4 inches; the cavities are filled up with dry straw or sugar-cane haum, laid smooth, on which are placed as many broad shallow pans of unglazed earth as the spaces will hold. These pans are so extremely porous that their outsides become moist the instant water is put into them. They are smeared with butter on the inside to prevent the ice from adhering to them, and this it is necessary to repeat every three or four days. It would otherwise be impossible to remove the ice without either breaking the vessel or spending more time in effecting it than could be afforded where so much is to be done in so short a time. In the afternoon these pans are all filled with water by persons who walk along the borders or ridges. About 5 o'clock in the morning they begin to remove the ice from the pans, which is done by striking an iron hook into the center of it, and by that means breaking it into several pieces. If the pans have been many days without smearing, and it happens that the whole of the water is frozen, it is almost impossible to extract the ice without breaking the pans. The number of pans exposed at one time is computed at about 100,000, and there are employed in filling them with water in the evenings and taking out the ice in the mornings about 300 men, women, and children. The water is taken from a well contiguous to the spot. It is necessary that the straw be dry. When it becomes wet, as it frequently does by accident, it is removed and displaced.[1]

References are found in the works of many ancient Greek authors indicating that some of the principles of artificial refrigeration were understood by the Greeks and practiced by them in cooling wine, water, and various other drinks. It also appears that they understood the present East Indian custom of using porous vessels. The Egyptians were accustomed to allow jars of boiling water to remain on the house roofs over night, and in the morning the jars were moistened with water on the outside, bound with grass or plants, and put in trenches. The discovery of the principle that warm or hot water exposed to the air is susceptible of greater evaporation than cold water, is generally ascribed to Nero, although it appears that Aristotle understood this principle, since he relates that if it was desired to cool water suddenly, it was customary to expose it first to the sun's rays. Medieval history indicates that the custom of cooling drinks spread from Greece and Italy to France and western Europe about the end of the Sixteenth century. At this time it was the custom to preserve snow and ice in cellars, to be used in cooling drinks during the summer months. This custom was at first looked upon as effeminate and luxurious, but by the end of the Seventeenth century the practice must have been common in France, as there were many who made a business of dealing in snow and ice. It is stated that saltpeter for refrigerating purposes was first used by the Italians about 1550. The liquor or liquid to be cooled was put into a little-necked bottle, which was immersed in a receptacle filled with cold water. Saltpeter was then added to the water of the outer vessel, and the bottle containing the water or wine to be cooled was twirled around on its axis. It was considered that the proportion of saltpeter to water should be one to four or five. The practice of mixing snow or ice with saltpeter or other salts to produce cold seems to have been well known early in the Seventeenth century, being referred to by several contemporary writers of that period. It is mentioned by Bacon, who stated that common salt could be used instead of saltpeter.

The development of ice manufacture has always had a very close relation to the possibility of procuring natural ice, and there has, therefore, been considerable competition between the two products. For this reason it is important to notice in this connection the development of the natural-ice industry. Notwithstanding the fact that the custom of icing wines and drinks prevailed among the wealthier Greeks and Romans in ancient times and among Italians and Frenchmen in the Seventeenth century, natural ice as an article of commerce did not obtain importance until the beginning of the Nineteenth century. From the inception of the industry the United States has been the great field for

[1] Ice and Refrigeration, July, 1901, page 3.

both the production and consumption of ice, and the commodity which in the Eighteenth century was rated a luxury has now become almost a necessity. The year 1805 may be looked upon as marking the beginning of the industry in the United States. The pioneer was Frederic Tudor, of Boston, Mass., who in 1805 shipped a cargo of 130 tons of ice to the West Indies. Although the venture resulted in a net loss of about $4,500, the cargo arrived at its destination in excellent condition. Two years later Mr. Tudor shipped a cargo of 240 tons to Havana, but this venture was likewise unprofitable. About the year 1812 he was granted by Great Britain a monopoly of the ice trade with her colonies in the West Indies, and later, 1815–16, he received the same concessions from Spain. From 1817 to 1820 he extended the trade to Charleston, S. C., Savannah, Ga., and New Orleans, La. In this way a large and profitable trade was established with the southern countries and with the southern ports of the United States. The ultimate success of Mr. Tudor prompted competitors to enter the field as exporters. The growth in the exports of ice between 1850 and 1900, shown in the following table, is taken from the reports of the bureau of statistics, Treasury Department:

EXPORTATION OF ICE.

YEAR.	Tons.	Value.
1850	.....	$107,018
1855	41,117	190,793
1860	49,153	183,134
1865	59,927	225,825
1870	65,802	267,702
1875	53,724	208,249
1880	45,666	136,686
1885	38,901	89,420
1890	44,849	111,762
1895	17,295	41,915
1900	13,720	29,501

It appears that the export trade in ice increased steadily until about 1870. After this date the exports of ice steadily decreased until in the year 1900 the number of tons exported was so insignificant that the foreign trade in ice may now be considered as practically extinct.

The growth of the domestic trade was simultaneous with the early increase in the export trade. In New York city ice was used by dealers in perishable goods as early as 1825, and the demand for it gradually developed in all the larger Eastern cities. The Civil War gave a decided impetus to the industry, as large quantities of ice were required for medical purposes in the hospital service. The rapidly increasing demand for ice in recent years is due in large part to the establishment and growth of industries which are dependent upon the use of this product. It has been impossible to obtain data relative to the production of the entire country, but some indication of the growth and extent of the industry may be obtained from the following table, which gives the quantity of ice harvested in the state of Maine and on the Hudson River since 1878. Although these are the great harvesting regions of the country, their annual yield probably does not represent much more than half the ice harvest of the United States.

HARVEST OF MAINE AND HUDSON RIVER ICE SINCE 1878.[1]

YEAR.	Maine.	Hudson River.	Capacity of Hudson River ice houses.
	Tons.	*Tons.*	*Tons.*
1878	.....	2,225,000	2,300,000
1879	.....	2,371,000	2,400,000
1880	1,426,800	800,000	2,500,000
1881	994,800	2,558,000	2,650,000
1882	1,227,200	1,954,700	2,728,700
1883	1,364,500	3,017,600	3,100,000
1884	1,118,000	3,026,000	3,100,000
1885	1,490,400	3,019,500	3,200,000
1886	1,368,400	2,355,500	3,259,000
1887	1,311,100	3,226,000	3,367,000
1888	1,087,000	3,330,500	3,330,500
1889	1,529,600	2,742,000	3,432,000
1890	3,092,400	.....	3,432,000
1891	1,285,000	2,624,000	3,425,000
1892	1,435,900	2,500,000	3,525,000
1893	1,444,000	3,407,839	3,454,400
1894	1,600,800	2,688,500	3,459,500
1895	1,413,500	3,409,000	3,528,500
1896	1,466,000	2,785,500	3,450,400
1897	1,526,500	2,675,033	3,716,381
1898	1,242,500	2,172,400	4,183,434
1899	1,326,480	4,300,293	4,316,331
1900	723,780	1,430,670	4,215,970

[1] Ice Trade Journal.

Some time before the natural-ice industry became a factor of commercial importance attempts had been made to produce ice by abstracting the latent heat from water by artificial means. The first machine for the manufacture of ice was invented in 1755 by Dr. William Cullen, and was based on the principle that the creation of a vacuum increases the evaporation of water and by this means produces ice. Cullen reduced the atmospheric pressure by means of an air pump. About 1810 the chemical affinity of sulphuric acid for water was discovered and ice was produced by its use. The invention of the first machine capable of producing ice in quantities sufficient for commercial use is generally accredited to Mr. Jacob Perkins, an American engineer residing in London. He obtained a patent for his machine in 1834. The refrigerant was ether, and the evaporator containing the same was inclosed in pipes through which brine circulated at a temperature of 5° F. Boxes filled with water were placed in a receptacle into which flowed the brine, freezing the water. The brine was then pumped back, and, after being exposed to the ether, could again be used. This machine is generally considered the forerunner of the modern compressor machine.[1] The use of the boxes developed into the use of cans and the manufacture of can ice. In order to describe adequately the development of the modern compressor and absorption machines it is necessary to mention several of the men prominently identified with the invention or improvement of ice-making apparatus.

[1] Ice and Refrigeration, August, 1901, page 46.

Prof. A. C. Twining, of New Haven, Conn., took out a patent for an ice machine in England in 1850 and in the United States in 1853. In 1855 he operated a machine in Cleveland, Ohio, which produced over 1,600 pounds of ice in twenty-four hours, and was operated intermittently until 1857. Although the Perkins machine was the forerunner of the compressor machine of the present time, the Twining machine more nearly represents the complete compressor system of to-day, and for this reason Professor Twining deserves the credit both for the invention of this system and for putting it into practical operation.[1] Professor Twining also discovered that ice frozen at a temperature slightly below the freezing point would be transparent with the exception of the small porous core, while if frozen at a lower temperature it would be opaque and porous throughout. A patent for the manufacture of ice by mechanical means was issued in 1857 to Dr. John Gorrie, of Appalachicola, Fla. The apparatus used by Dr. Gorrie is important in that it was the forerunner of the compressed-air machine later invented by Dr. Alexander Kirk. In 1858–1860 Ferdinand P. E. Carre, a Frenchman, introduced an ice-making and refrigerating apparatus from which has developed the modern ammonia absorption system. It was by means of this machine that the trade in frozen meat was introduced to the world. The Carre machine was also the first to obtain prominence in the ice-making industry of the United States. In the infancy of the industry the ice was opaque, and it was not until about 1868 that transparent ice was made by the use of distilled water. Capt. David Smith, of Chatham, Mass., was the originator of the plate-ice system. He erected in Oakland, Cal., the first machine of this character.

From the inception of the United States Patent Office to January 1, 1902, there have been 4,337 patents granted for various processes of refrigeration. Of this number, 681 have been issued for the manufacture of ice machines. These various inventions prepared the way for the development of the manufactured-ice industry, which has already been described in the pages of the bulletin.

Table 11, which follows, shows in detail the statistics relating to the manufacture of ice, as reported by the 787 establishments engaged in this industry for 1900.

[1] Mechanical Refrigeration, De La Vergne Refrigerating Machine Company, 1887, page 9.

TABLE 11.—ICE MANUFACTURE, BY

		United States.	Alabama.	Arizona.	Arkansas.	California.
1	Number of establishments	787	23	9	18	20
	Character of organization:					
2	Individual	179	4	1	4	2
3	Firm and limited partnership	133	5	4	3	2
4	Incorporated company	475	14	4	11	16
	Capital:					
5	Total	$38,204,054	$631,667	$228,670	$637,639	$1,305,971
6	Land	$4,679,379	$62,800	$16,050	$59,350	$236,100
7	Buildings	$7,387,014	$79,900	$49,916	$80,365	$166,553
8	Machinery, tools, and implements	$22,852,158	$439,600	$136,000	$415,006	$806,135
9	Cash and sundries	$3,285,503	$49,367	$26,704	$82,918	$97,183
10	Proprietors and firm members	459	13	11	11	7
	Salaried officials, clerks, etc.:					
11	Total number	1,545	43	12	26	64
12	Total salaries	$1,284,803	$35,680	$10,370	$24,330	$62,661
	Officers of corporations—					
13	Number	446	16	2	11	12
14	Salaries	$465,104	$18,280	$3,710	$11,400	$17,566
	General superintendents, managers, clerks, etc—					
15	Total number	1,099	27	10	15	52
16	Total salaries	$769,699	$17,400	$6,660	$12,930	$45,095
	Men—					
17	Number	1,024	26	10	15	50
18	Salaries	$740,292	$17,300	$6,660	$12,930	$44,095
	Women—					
19	Number	75	1	.....	.....	2
20	Salaries	$29,407	$100	.....	.....	$1,000
	Wage-earners, including pieceworkers, and total wages:					
21	Greatest number employed at any one time during the year	10,814	249	66	244	265
22	Least number employed at any one time during the year	4,893	155	25	105	131
23	Average number	6,933	168	44	163	190
24	Wages	$3,424,305	$56,251	$30,608	$61,064	$132,023
	Men, 16 years and over—					
25	Average number	6,889	168	44	162	188
26	Wages	$3,416,844	$56,251	$30,608	$60,944	$131,543
	Women, 16 years and over—					
27	Average number	8	.....	.....	.....	2
28	Wages	$3,592	.....	.....	.....	$480
	Children, under 16 years—					
29	Average number	36	.....	.....	1	.....
30	Wages	$3,869	.....	.....	$120	.....
	Average number of wage-earners, including pieceworkers, employed during each month:[2]					
	Men, 16 years and over—					
31	January	3,885	112	19	87	181
32	February	4,058	118	21	96	164
33	March	4,676	120	25	125	162
34	April	6,477	170	41	158	192
35	May	8,570	225	62	196	208
36	June	9,483	218	63	226	187
37	July	9,808	220	64	226	220
38	August	9,794	222	66	229	219
39	September	9,236	213	63	212	193
40	October	7,300	163	53	165	191
41	November	5,124	122	31	122	167
42	December	4,263	107	22	101	175
	Miscellaneous expenses:					
43	Total	$1,779,390	$31,777	$10,408	$30,762	$89,759
44	Rent of works	$116,026	$3,799	$244	$696	$6,160
45	Taxes, not including internal revenue	$246,340	$4,289	$2,470	$4,288	$6,256
46	Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$1,394,180	$23,689	$6,599	$25,478	$77,343
47	Contract work	$23,344	.....	$1,095	$300	.....
	Materials used:					
48	Aggregate cost	$3,339,724	$53,899	$41,505	$51,700	$119,889
	Ammonia—					
49	Total cost	$359,549	$12,766	$4,133	$5,910	$12,913
50	Total pounds	2,379,989	122,415	10,279	20,984	67,653
	Ammonia, anhydrous—					
51	Cost	$279,680	$6,745	$4,133	$5,910	$10,413
52	Pounds	1,056,585	24,989	10,279	20,984	32,653
	Ammonia, aqua—					
53	Cost	$79,869	$6,021	.....	.....	$2,500
54	Pounds	1,323,454	97,426	.....	.....	35,000
55	Fuel	$2,144,316	$28,185	$32,851	$32,118	$68,558
56	Rent of power and heat	$20,336	.....	$350	$2	$10,390
57	Mill supplies	$216,383	$4,396	$1,391	$3,824	$4,897
58	All other materials	$501,485	$4,293	$2,295	$7,296	$20,611
59	Freight	$97,655	$3,759	$485	$2,550	$2,520
	Products:					
60	Aggregate value	$13,874,513	$253,475	$132,611	$236,289	$511,197
	Ice—					
61	Total value	$13,308,874	$252,675	$120,765	$225,029	$415,388
62	Total tons	4,294,439	55,908	14,709	51,236	90,679
	Can ice—					
63	Value	$12,863,160	$252,675	$120,765	$225,029	$353,888
64	Tons	4,139,764	55,908	14,709	51,236	80,679
	Plate ice—					
65	Value	$440,714	.....	.....	.....	$61,500
66	Tons	154,675	.....	.....	.....	10,000
67	All other products	$570,639	$800	$11,846	$11,260	$95,809
	Comparison of products:					
68	Number of establishments reporting for both years	551	14	4	10	15
69	Value for census year	$10,379,966	$201,761	$68,900	$163,737	$469,497
70	Value for preceding business year	$9,841,283	$179,406	$56,500	$159,071	$435,706

[1] Includes the statistics for 12 establishments, the schedules for which were received too late to be included in the tables presented in Parts I and II, Manufactures. These establishments are distributed as follows: Alabama, 2; Arkansas, 3; Florida, 2; Louisiana, 2; Mississippi, 2; Oklahoma, 1.

STATES AND TERRITORIES: 1900. [1]

Colorado.	Connecticut.	Delaware.	District of Columbia.	Florida.	Georgia.	Illinois.	Indiana.	Indian Territory.	Iowa.	Kansas.	Kentucky.	Louisiana.	
6	5	7	4	35	32	29	47	3	3	19	31	36	1
.....	.....	2	.....	19	6	3	15	1	.....	6	6	10	2
2	2	.....	1	6	5	9	9	.....	.....	7	7	3	3
4	3	5	3	10	21	17	23	2	3	6	18	23	4
$664,360	$316,722	$259,501	$629,992	$740,131	$975,100	$1,689,253	$1,580,603	$62,974	$165,300	$425,199	$1,200,117	$2,265,961	5
$60,721	$47,000	$17,300	$65,000	$45,059	$63,950	$114,930	$138,850	$2,300	$23,000	$24,870	$91,890	$388,779	6
$108,965	$71,843	$42,000	$180,000	$92,400	$128,988	$335,018	$287,000	$19,100	$29,800	$68,500	$241,474	$496,881	7
$465,060	$171,843	$176,700	$355,024	$530,309	$724,050	$1,036,878	$1,040,078	$39,350	$88,000	$295,779	$763,581	$1,276,066	8
$29,614	$26,036	$28,501	$29,968	$72,863	$58,112	$202,427	$94,675	$2,224	$24,500	$36,050	$103,172	$104,235	9
6	5	2	2	26	14	22	35	2	3	18	22	16	10
18	15	8	16	24	48	92	61	4	10	20	52	78	11
$21,235	$17,681	$4,316	$14,310	$21,371	$42,535	$75,210	$43,856	$1,525	$3,055	$13,420	$32,600	$67,132	12
8	5	4	6	6	14	11	27	.....	3	6	19	26	13
$12,350	$8,000	$1,560	$5,150	$4,860	$15,550	$17,420	$23,230	.....	$800	$4,850	$17,850	$38,942	14
10	10	4	10	18	34	81	34	4	7	14	33	52	15
$8,885	$9,681	$2,756	$9,160	$16,511	$26,985	$57,790	$20,626	$1,525	$2,255	$3,570	$14,750	$38,190	16
10	8	4	10	18	34	62	24	4	7	14	33	50	17
$8,885	$8,181	$2,756	$9,160	$16,511	$26,985	$49,058	$17,164	$1,525	$2,255	$8,570	$14,750	$32,390	18
.....	2	.....	.....	.....	.....	19	10	.....	.....	.....	.....	2	19
.....	$1,500	.....	.....	.....	.....	$8,732	$3,462	.....	.....	.....	.....	$800	20
142	60	43	111	315	407	831	574	20	57	188	322	508	21
53	27	21	52	191	209	344	212	11	15	92	148	173	22
93	38	28	88	244	251	624	343	10	33	114	192	299	23
$53,517	$21,041	$12,480	$40,603	$100,533	$86,210	$303,317	$161,902	$4,003	$15,067	$55,427	$84,321	$126,067	24
93	38	27	88	242	250	623	343	10	33	113	188	292	25
$53,517	$21,041	$12,330	$40,603	$100,265	$86,030	$302,615	$161,902	$4,003	$15,067	$55,217	$84,041	$125,265	26
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	1	27
.....	.....	.....	.....	.....	.....	$702	.....	.....	.....	$210	.....	$240	28
.....	.....	1	.....	2	1	.....	.....	.....	.....	.....	4	6	29
.....	.....	$150	.....	$268	$180	.....	.....	.....	.....	.....	$280	$562	30
58	27	17	39	193	143	389	190	2	10	66	97	148	31
68	29	14	53	196	135	429	186	2	13	76	88	145	32
63	32	14	64	204	150	443	226	4	18	96	108	151	33
75	38	20	94	242	255	538	322	14	21	122	174	233	34
85	36	41	111	256	332	731	385	17	35	148	262	387	35
113	43	42	111	285	383	808	451	16	47	138	270	477	36
133	49	42	111	287	371	826	524	17	52	153	282	469	37
132	48	42	111	288	373	829	531	17	57	151	283	474	38
128	45	39	101	290	353	811	470	19	52	147	269	440	39
114	49	27	71	250	238	655	381	11	41	114	208	315	40
79	37	15	65	211	140	576	252	4	32	79	122	139	41
72	29	14	65	196	131	447	195	2	18	66	99	123	42
$12,611	$11,363	$8,214	$36,979	$21,472	$49,654	$173,595	$67,954	$1,830	$9,014	$15,715	$64,879	$85,103	43
$150	$750	.....	$8,900	$937	$2,005	$1,935	$2,025	.....	$696	$601	$555	$756	44
$4,308	$1,544	$996	$7,240	$5,391	$8,826	$6,735	$12,609	$515	$875	$2,849	$8,961	$15,182	45
$8,153	$9,069	$7,218	$20,839	$14,844	$38,373	$165,225	$53,320	$1,315	$7,443	$12,265	$55,363	$69,165	46
.....	.....	.....	.....	$300	$450	.....	.....	.....	.....	.....	.....	.....	47
$31,446	$16,014	$13,654	$61,267	$131,816	$126,512	$173,850	$121,390	$5,327	$10,530	$55,784	$81,564	$193,241	48
$5,561	$1,371	$1,580	$2,314	$13,276	$12,736	$14,813	$15,809	$443	$1,749	$5,891	$12,006	$24,424	49
44,264	5,313	6,030	9,310	149,086	107,925	74,829	144,476	1,550	24,600	42,938	99,007	191,178	50
$8,407	$1,371	$1,580	$2,314	$5,750	$7,759	$13,674	$9,993	$443	$549	$4,435	$8,303	$15,047	51
11,035	5,313	6,030	9,310	19,736	29,948	54,396	36,879	1,550	2,100	16,378	29,507	53,626	52
$2,157	.....	.....	.....	$7,526	$4,977	$1,139	$5,816	.....	$1,200	$1,456	$3,703	$9,377	53
33,229	.....	.....	.....	129,350	77,977	20,433	107,597	.....	22,500	26,565	69,500	137,552	54
$23,754	$11,166	$9,746	$35,504	$80,258	$80,531	$97,425	$65,680	$3,762	$7,772	$38,441	$58,080	$124,260	55
.....	$300	.....	$900	$800	.....	$720	.....	.....	.....	.....	.....	$125	56
$654	$885	$775	$3,150	$8,936	$9,538	$7,674	$7,992	$130	$607	$4,623	$4,304	$8,009	57
$193	$2,128	$1,548	$18,349	$22,746	$19,169	$50,141	$29,029	$342	$350	$6,129	$6,204	$33,063	58
$1,281	$164	$5	$1,050	$5,805	$4,538	$3,077	$2,880	$350	$52	$700	$820	$3,360	59
$204,029	$95,304	$71,240	$182,575	$438,782	$456,964	$990,827	$544,005	$19,540	$38,400	$196,310	$454,497	$591,500	60
$204,029	$95,304	$71,240	$147,575	$437,382	$455,699	$877,178	$514,531	$19,440	$36,600	$193,310	$375,897	$563,561	61
51,545	25,950	26,738	64,950	125,184	131,236	249,813	199,184	3,060	13,500	62,486	137,472	179,716	62
$204,029	$73,804	$61,050	$105,575	$437,382	$455,699	$869,178	$514,531	$19,440	$36,600	$193,310	$375,897	$563,561	63
51,545	21,650	24,700	44,450	125,184	131,236	249,013	199,184	3,060	13,500	62,486	137,472	179,716	64
.....	$21,500	$10,190	$42,000	.....	.....	$8,000	.....	.....	.....	.....	.....	.....	65
.....	4,300	2,038	20,500	.....	.....	800	.....	.....	.....	.....	.....	.....	66
.....	.....	.....	$35,000	$1,400	$1,265	$113,649	$29,474	$100	$1,800	$3,000	$78,600	$27,939	67
4	4	4	3	21	23	22	37	2	2	13	25	22	68
$158,329	$88,500	$51,800	$149,500	$271,638	$270,663	$638,524	$446,825	$18,100	$97,600	$151,970	$412,397	$411,886	69
$129,353	$78,085	$52,100	$146,000	$264,567	$338,488	$584,373	$452,863	$16,537	$27,600	$152,350	$403,846	$418,046	70

[2]The average number of women, 16 years and over, and children, under 16 years, employed during each month are not included in the table, because of the small number reported.

TABLE 11.—ICE MANUFACTURE, BY

		Maryland.	Mississippi.	Missouri.	New Jersey.	New Mexico.
1	Number of establishments	18	23	31	26	4
	Character of organization:					
2	Individual	4	9	4	6	3
3	Firm and limited partnership	1	5	3	3	.....
4	Incorporated company	13	9	24	17	1
	Capital:					
5	Total	$649,692	$597,871	$1,835,166	$1,653,028	$118,450
6	Land	$93,191	$93,510	$271,383	$175,700	$10,650
7	Buildings	$100,100	$94,061	$406,038	$396,470	$29,000
8	Machinery, tools, and implements	$421,425	$372,210	$977,152	$970,344	$72,000
9	Cash and sundries	$34,976	$38,090	$180,593	$110,514	$6,800
10	Proprietors and firm members	6	14	13	12	3
	Salaried officials, clerks, etc.:					
11	Total number	19	28	65	52	2
12	Total salaries	$14,535	$23,900	$66,315	$37,999	$2,400
	Officers of corporations—					
13	Number	6	8	26	16	2
14	Salaries	$2,550	$5,500	$33,618	$14,410	$2,400
	General superintendents, managers, clerks, etc.—					
15	Total number	13	20	39	36	.....
16	Total salaries	$11,985	$18,400	$32,697	$23,589	.....
	Men—					
17	Number	13	20	35	35	.....
18	Salaries	$11,985	$18,400	$30,593	$23,439	.....
	Women—					
19	Number	.....	.....	4	1	.....
20	Salaries	.....	.....	$2,104	$150	.....
	Wage-earners, including pieceworkers, and total wages:					
21	Greatest number employed at any one time during the year	204	271	476	272	39
22	Least number employed at any one time during the year	113	111	169	148	15
23	Average number	138	162	279	183	22
24	Wages	$74,633	$56,503	$157,006	$94,070	$15,300
	Men, 16 years and over—					
25	Average number	137	160	279	182	21
26	Wages	$74,318	$55,519	$157,006	$93,570	$15,200
	Women, 16 years and over—					
27	Average number	.....	1	.....	1	.....
28	Wages	.....	$960	.....	$500	.....
	Children, under 16 years—					
29	Average number	1	1	.....	.....	1
30	Wages	$320	$24	.....	.....	$100
	Average number of wage-earners, including pieceworkers, employed during each month:[1]					
	Men, 16 years and over—					
31	January	96	60	134	102	12
32	February	76	67	149	128	12
33	March	105	79	178	153	12
34	April	127	133	250	179	15
35	May	151	227	335	220	24
36	June	180	272	381	233	30
37	July	187	275	412	234	31
38	August	188	258	429	241	36
39	September	186	236	379	237	27
40	October	143	171	327	206	19
41	November	104	76	215	136	16
42	December	96	62	157	117	16
	Miscellaneous expenses:					
43	Total	$24,490	$33,730	$72,868	$51,276	$1,983
44	Rent of works	$185	$120	$6,720	$4,325	.....
45	Taxes, not including internal revenue	$5,972	$6,995	$10,224	$7,510	$1,033
46	Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$18,333	$26,615	$55,924	$39,441	$950
47	Contract work	.....	.....	.....	.....	.....
	Materials used:					
48	Aggregate cost	$84,070	$68,520	$226,385	$108,158	$15,480
	Ammonia—					
49	Total cost	$5,177	$6,489	$22,302	$6,876	$1,700
50	Total pounds	22,515	44,115	128,114	33,593	14,758
	Ammonia, anhydrous—					
51	Cost	$5,177	$4,871	$19,896	$6,485	$700
52	Pounds	22,515	19,189	91,663	26,693	2,636
	Ammonia, aqua—					
53	Cost	.....	$1,618	$2,406	$391	$1,000
54	Pounds	.....	24,926	31,451	6,900	12,122
55	Fuel	$56,978	$33,420	$157,612	$74,591	$11,175
56	Rent of power and heat	.....	.....	$2,300	.....	.....
57	Mill supplies	$4,189	$4,687	$9,840	$5,992	$380
58	All other materials	$16,160	$21,278	$33,284	$19,088	$350
59	Freight	$1,566	$2,651	$1,047	$1,611	$1,875
	Products:					
60	Aggregate value	$358,668	$288,739	$641,405	$391,685	$77,775
	Ice—					
61	Total value	$358,668	$268,175	$635,503	$379,776	$77,775
62	Total tons	120,740	57,207	285,796	169,755	10,915
	Can ice—					
63	Value	$348,083	$268,175	$635,503	$341,176	$77,775
64	Tons	116,800	57,207	285,796	154,615	10,915
	Plate ice—					
65	Value	$10,585	.....	.....	$38,600	.....
66	Tons	3,940	.....	.....	15,140	.....
67	All other products	.....	$20,564	$5,902	$11,909	.....
	Comparison of products:					
68	Number of establishments reporting for both years	13	15	24	11	2
69	Value for census year	$318,727	$180,619	$526,067	$257,931	$48,000
70	Value for preceding business year	$190,280	$172,619	$508,866	$223,850	$41,000

[1] The average number of women, 16 years and over, and children, under 16 years, employed during each month, are not included in the table, because of the small number reported.

STATES AND TERRITORIES: 1900—Continued.

New York.	North Carolina.	Ohio.	Oklahoma.	Oregon.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	Washington.	West Virginia.	All other states.[2]	
41	23	42	7	9	73	13	27	77	30	4	8	4	1
10	3	12	.....	4	10	3	4	19	7	1	1	.....	2
3	5	3	2	2	16	3	8	8	6	.....	.....	.....	3
28	15	27	5	3	47	7	15	50	17	3	7	4	4
$2,554,722	$528,243	$1,777,430	$194,323	$172,800	$8,259,861	$407,400	$1,103,501	$2,563,888	$1,198,981	$252,360	$413,452	$198,726	5
$341,518	$37,465	$180,742	$11,001	$22,100	$1,233,100	$25,225	$194,950	$267,495	$141,400	$46,000	$58,000	$18,000	6
$595,070	$63,300	$397,900	$44,223	$20,200	$1,539,675	$102,550	$243,176	$545,348	$211,500	$32,000	$77,700	$40,000	7
$1,432,701	$381,956	$1,012,707	$111,168	$107,500	$4,712,816	$241,000	$530,695	$1,581,367	$677,882	$133,500	$250,823	$105,453	8
$185,433	$40,522	$186,081	$27,931	$23,000	$774,270	$38,625	$134,080	$169,678	$168,199	$40,860	$26,929	$35,273	9
17	13	17	7	7	51	7	20	35	20	1	1	.....	10
63	37	79	16	9	246	13	67	171	46	13	19	9	11
$51,789	$32,317	$53,410	$13,080	$13,980	$169,993	$10,182	$58,622	$124,671	$34,934	$13,750	$13,716	$7,923	12
20	12	35	1	1	59	2	18	35	18	3	7	1	13
$17,990	$16,922	$26,304	$300	$4,800	$45,884	$2,100	$24,110	$41,550	$17,240	$5,400	$6,300	$1,208	14
43	25	44	15	[illegible]8	187	11	49	136	28	10	12	8	15
$33,790	$15,395	$27,106	$12,780	$9,180	$124,109	$8,082	$34,512	$83,121	$17,694	$8,350	$7,416	$6,715	16
41	24	33	14	8	171	11	48	136	27	10	11	8	17
$33,362	$14,915	$22,774	$12,300	$9,180	$119,501	$8,082	$34,152	$83,121	$17,332	$8,350	$6,916	$6,715	18
2	1	11	1	.....	16	.....	1	.....	1	.....	1	.....	19
$137	$480	$4,332	$480	.....	$4,608	.....	$360	.....	$362	.....	$500	.....	20
453	290	501	81	51	1,564	114	600	964	306	48	120	63	21
261	144	198	23	33	730	62	277	375	170	23	51	26	22
319	161	299	51	35	930	73	385	618	205	35	80	41	23
$201,394	$52,647	$154,561	$28,171	$25,235	$537,748	$23,781	$177,461	$305,282	$87,193	$25,700	$39,587	$23,649	24
319	160	297	50	35	930	73	381	607	205	35	80	41	25
$201,394	$52,532	$154,411	$28,096	$25,235	$537,748	$23,781	$177,036	$303,682	$87,193	$25,700	$39,587	$23,649	26
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	27
.....	.....	.....	.....	.....	.....	.....	.....	$500	.....	.....	.....	.....	28
.....	1	2	1	.....	.....	.....	4	10	.....	.....	.....	.....	29
.....	$115	$150	$75	.....	.....	.....	$425	$1,100	.....	.....	.....	.....	30
182	74	150	18	28	487	43	219	289	91	25	52	45	31
197	102	155	22	28	491	43	242	298	93	25	52	45	32
237	119	184	37	29	564	45	270	390	145	25	54	45	33
312	197	245	55	31	942	65	320	576	194	25	67	35	34
389	253	368	62	35	1,263	101	444	755	251	45	92	38	35
424	230	415	74	42	1,322	103	532	872	293	47	115	40	36
425	205	431	77	50	1,362	102	551	897	311	47	116	49	37
420	202	448	77	49	1,273	109	564	906	310	47	116	49	38
410	197	413	75	38	1,185	101	522	888	299	47	111	40	39
344	148	352	62	30	937	78	395	648	249	38	71	36	40
269	111	218	26	28	710	47	293	435	128	27	60	32	41
218	84	185	16	28	624	41	224	330	94	27	50	32	42
$177,727	$18,042	$71,065	$17,968	$14,502	$290,339	$18,225	$58,878	$132,435	$37,174	$10,735	$11,188	$15,876	43
$31,056	$1,230	$1,558	$4,500	$3,000	$24,474	$460	$180	$5,209	$1,350	$1,500	.....	.....	44
$13,813	$4,676	$20,139	$2,755	$1,097	$24,748	$3,107	$16,345	$22,334	$6,850	$1,285	$3,042	$1,081	45
$112,282	$12,136	$48,783	$10,713	$10,405	$241,079	$14,658	$42,403	$104,892	$28,974	$7,950	$8,146	$14,795	46
$20,576	.....	$585	.....	.....	$38	.....	.....	.....	.....	.....	.....	.....	47
$268,695	$66,291	$138,135	$30,662	$19,155	$892,484	$37,327	$109,505	$320,381	$106,323	$17,318	$22,327	$19,620	48
$23,274	$6,143	$14,756	$1,833	$1,934	$48,887	$4,439	$13,685	$32,280	$12,928	$2,605	$5,573	$970	49
102,629	44,418	141,365	10,328	6,043	225,936	58,333	88,573	168,637	88,607	6,883	74,870	3,435	50
$22,774	$4,530	$9,851	$1,333	$1,934	$45,964	$941	$10,916	$27,555	$9,650	$2,605	$1,702	$970	51
93,129	16,748	40,051	4,842	6,043	179,994	3,613	41,406	92,701	33,111	6,883	7,175	3,435	52
$500	$1,613	$4,905	$500	.....	$2,923	$3,498	$2,769	$4,725	$3,278	.....	$3,871	.....	53
9,500	27,670	101,314	5,486	.....	45,942	54,720	47,167	75,936	55,496	.....	67,695	.....	54
$188,349	$45,114	$89,478	$22,070	$10,980	$235,555	$25,005	$82,321	$203,863	$71,923	$12,362	$12,404	$13,080	55
.....	$1,050	.....	.....	$2,400	.....	.....	.....	$348	$651	.....	.....	.....	56
$15,084	$5,274	$12,753	$2,119	$1,378	$26,437	$2,438	$8,550	$31,547	$9,058	$1,300	$2,182	$1,000	57
$37,762	$3,823	$15,494	$2,340	$2,417	$60,124	$3,610	$4,149	$44,595	$7,187	$971	$1,362	$3,550	58
$4,226	$4,887	$5,654	$2,300	$96	$21,481	$1,835	$800	$7,748	$4,576	$80	$806	$1,020	59
$1,051,372	$228,305	$582,538	$106,003	$116,031	$2,038,504	$116,357	$538,107	$1,184,332	$427,974	$103,600	$119,401	$86,172	60
$1,025,308	$228,305	$577,038	$106,003	$95,260	$2,000,931	$116,357	$538,107	$1,168,640	$417,052	$103,600	$119,201	$82,572	61
457,779	61,338	237,750	22,218	17,165	735,018	45,228	158,931	231,450	118,240	17,300	35,734	28,509	62
$1,015,308	$228,305	$548,542	$106,003	$95,260	$1,866,770	$114,857	$538,107	$1,159,040	$362,542	$103,600	$119,201	$72,500	63
456,279	61,338	220,833	22,218	17,165	684,144	44,853	158,931	229,050	96,458	17,300	35,734	24,400	64
$10,000	.....	$28,496	.....	.....	$134,161	$1,500	.....	$9,600	$54,510	.....	.....	$10,072	65
1,500	.....	16,917	.....	.....	50,874	375	.....	2,400	21,782	.....	.....	4,109	66
$26,064	.....	$5,500	.....	$20,771	$37,573	.....	.....	$15,692	$10,922	.....	$200	$3,600	67
26	15	36	4	6	50	9	20	62	20	3	6	4	68
$806,628	$174,892	$532,480	$61,516	$41,031	$1,172,228	$92,857	$461,727	$970,290	$267,137	$97,600	$106,837	$86,172	69
$789,728	$168,241	$551,678	$59,000	$39,565	$1,167,063	$87,923	$571,453	$870,529	$248,321	$78,000	$105,151	$73,072	70

[2] Includes establishments distributed as follows: Nebraska, 1; Rhode Island, 2; Utah, 1.

TABLE 11.—ICE MANUFACTURE, BY

		United States.	Alabama.	Arizona.	Arkansas.	California.
	Power:					
71	Number of establishments reporting power	766	22	9	18	17
72	Total horsepower	102,695	1,872	609	2,561	2,343
	Owned—					
	Engines—					
73	Steam, number	1,447	29	14	44	18
74	Horsepower	96,711	1,872	609	2,551	1,420
75	Gas or gasoline, number	9	.....	.....	.....	1
76	Horsepower	193	.....	.....	.....	8
	Water wheels—					
77	Number	23	.....	.....	.....	6
78	Horsepower	807	.....	.....	.....	330
	Electric motors—					
79	Number	85	.....	.....	1	10
80	Horsepower	1,492	.....	.....	10	360
	Other power—					
81	Number	101	.....	.....	.....	.....
82	Horsepower	2,793	.....	.....	.....	.....
	Rented—					
83	Electric, horsepower	389	.....	.....	.....	225
84	Other kinds, horsepower	310	.....	.....	.....	.....
85	Furnished to other establishments	332	.....	.....	.....	.....
	Establishments classified by number of persons employed, not including proprietors and firm members:					
86	Total number of establishments	787	23	9	18	20
87	No employees	4	.....	.....	.....	.....
88	Under 5	93	4	1	3	5
89	5 to 20	534	15	8	12	11
90	21 to 50	130	4	.....	2	3
91	51 to 100	21	.....	.....	1	1
92	101 to 250	3	.....	.....	.....	.....
93	251 to 500	2	.....	.....	.....	.....

STATES AND TERRITORIES: 1900—Continued.

Colorado.	Connecticut.	Delaware.	District of Columbia.	Florida.	Georgia.	Illinois.	Indiana.	Indian Territory.	Iowa.	Kansas.	Kentucky.	Louisiana.	
6	5	7	4	35	31	28	44	3	3	19	30	35	71
292	779	631	1,460	3,049	3,555	4,104	3,620	190	450	2,142	3,232	4,980	72
12	12	11	16	58	61	61	88	3	6	25	60	65	73
292	767	591	1,300	2,563	3,555	4,056	3,507	190	450	2,122	3,201	4,650	74
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	1	.....	.....	75
.....	.....	.....	.....	.....	.....	12	.....	.....	.....	20	.....	.....	76
.....	.....	1	1	1	.....	.....	.....	.....	.....	.....	.....	.....	77
.....	.....	30	50	4	.....	.....	.....	.....	.....	.....	.....	.....	78
.....	.....	1	.....	.....	.....	3	3	.....	.....	.....	4	1	79
.....	.....	10	.....	.....	.....	21	108	.....	.....	.....	31	3	80
.....	.....	.....	.....	27	.....	.....	1	.....	.....	.....	.....	19	81
.....	.....	.....	.....	482	.....	.....	5	.....	.....	.....	.....	322	82
.....	12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5	83
.....	.....	.....	110	.....	.....	15	.....	.....	.....	.....	.....	.....	84
.....	.....	.....	5	2	.....	.....	.....	.....	110	.....	20	.....	85
6	5	7	4	35	32	29	47	3	3	19	31	36	86
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	87
.....	.....	2	.....	4	8	3	9	1	.....	1	2	2	88
2	3	5	1	28	19	18	29	2	2	17	25	27	89
3	2	.....	2	2	4	6	7	.....	1	1	4	5	90
1	.....	.....	1	.....	1	1	2	.....	.....	.....	.....	.....	91
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	92
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	93

TABLE 11.—ICE MANUFACTURE, BY

		Maryland.	Mississippi.	Missouri.	New Jersey.	New Mexico.
	Power:					
71	Number of establishments reporting power	18	23	31	26	3
72	Total horsepower	2,151	1,914	7,355	4,253	75
	Owned—					
	Engines—					
73	Steam, number	28	37	62	44	4
74	Horsepower	2,075	1,904	7,177	3,695	75
75	Gas or gasoline, number	1	.....	.....	.....	.....
76	Horsepower	25	.....	.....	.....	.....
	Water wheels—					
77	Number	1	.....	.....	1	.....
78	Horsepower	15	.....	.....	25	.....
	Electric motors—					
79	Number	2	1	4	9	.....
80	Horsepower	11	10	88	258	.....
	Other power—					
81	Number	5	.....	.....	8	.....
82	Horsepower	25	.....	.....	275	.....
	Rented—					
83	Electric, horsepower	.....	.....	90	.....	.....
84	Other kinds, horsepower	.....	.....	.....	.....	.....
85	Furnished to other establishments	.....	.....	37	31	.....
	Establishments classified by number of persons employed, not including proprietors and firm members:					
86	Total number of establishments	18	23	31	26	4
87	No employees	1	.....	.....	.....	.....
88	Under 5	1	2	3	2	1
89	5 to 20	13	17	17	21	3
90	21 to 50	3	4	10	3	1
91	51 to 100	.....	.....	1	.....	.....
92	101 to 250	.....	.....	.....	.....	.....
93	251 to 500	.....	.....	.....	.....	.....

STATES AND TERRITORIES: 1900—Continued.

New York.	North Carolina.	Ohio.	Oklahoma.	Oregon.	Pennsylvania.	South Carolina.	Tennessee.	Texas.	Virginia.	Washington.	West Virginia.	All other states.[1]	
41	23	41	7	9	71	11	25	75	30	4	8	4	71
5,487	2,275	6,205	670	720	17,028	1,080	3,612	8,964	3,502	425	635	475	72
75	31	84	9	13	206	13	51	128	56	4	14	5	73
5,357	1,845	5,175	670	605	16,622	744	3,589	8,825	3,288	425	589	355	74
.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	3	75
.....	.....	.....	.....	.....	6	.....	.....	2	.....	.....	.....	120	76
1	.....	.....	.....	.....	1	1	.....	3	6	.....	.....	.....	77
25	.....	.....	.....	.....	18	30	.....	100	180	.....	.....	.....	78
5	.....	7	.....	.....	26	1	2	2	1	.....	2	.....	79
65	.....	55	.....	.....	382	6	23	15	8	.....	28	.....	80
1	11	18	.....	.....	.....	3	.....	7	.....	.....	1	.....	81
10	365	975	.....	.....	.....	300	.....	16	.....	.....	18	.....	82
.....	.....	.....	.....	25	.....	.....	.....	6	26	.....	.....	.....	83
30	65	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	84
5	.....	.....	.....	8	58	.....	.....	56	.....	.....	.....	.....	85
41	23	42	7	9	73	13	27	77	30	4	8	4	86
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	87
2	2	5	.....	4	7	3	2	8	3	1	1	1	88
34	18	29	6	5	39	8	14	55	25	2	4	1	89
5	1	7	1	.....	20	1	9	11	2	1	3	2	90
.....	2	1	.....	.....	6	.....	.....	3	.....	.....	.....	.....	91
.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	92
.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	93

[1] Includes establishments distributed as follows: Nebraska, 1; Rhode Island, 2; Utah, 1