Twelfth Census of the United States.

CENSUS BULLETIN.

No. 164. WASHINGTON, D. C. April 29, 1902.

AGRICULTURE.

CALIFORNIA.

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

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics of agriculture for the state of California, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that—

> The schedules relating to agriculture shall comprehend the following topics: Name of occupant of each farm, color of occupant, tenure, acreage, value of farm and improvements, acreage of different products, quantity and value of products, and number and value of live stock. All questions as to quantity and value of crops shall relate to the year ending December thirty-first next preceding the enumeration.

A "farm," as defined by the Twelfth Census, includes all the land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It includes also the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The farms of California, June 1, 1900, numbered 72,542, and had a value of $707,912,960. Of this amount $77,468,000, or 10.9 per cent, represents the value of buildings, and $630,444,960, or 89.1 per cent, the value of land and improvements other than buildings. On the same date the value of farm implements and machinery was $21,311,670, and that of live stock, $67,303,325. These values, added to that of farms, give $796,527,955, the "total value of farm property."

The products derived from domestic animals, poultry, and bees, including animals sold and animals slaughtered on farms, are referred to in this bulletin as "animal products." The total value of all such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was $131,690,606, of which amount $36,324,894, or 27.6 per cent, represents the value of animal products, and $95,365,712, or 72.4 per cent, the value of crops, including forest products cut or produced on farms. The total value of farm products for 1899 exceeds that reported for 1889 by $44,057,316, or 51.3 per cent.

The value of "net farm products," or the "gross farm income," is obtained by deducting from the total value of farm products the value of the products fed to live stock on the farms of the producers. In 1899 the reported value of products fed was $13,488,570, leaving $118,202,036 as the gross farm income. The percentage which this latter amount is of the "total value of farm property" is referred to in the text as the "percentage of gross income upon investment." For California in 1899 it was 14.8 per cent.

As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained by any census, no statement of net farm income can be given.

Special reports as to the dimensions and cost of the leading irrigation ditches and canals, the area of land under them, methods for the artificial application of water to the growing crops, and other facts relating to irrigation were obtained by correspondence with farmers, engineers, and others. This correspondence was under the joint direction of Mr. F. H. Newell, chief hydrographer of the Geological Survey, acting as expert special agent for the division of agriculture, and Mr. Clarence J. Blanchard.

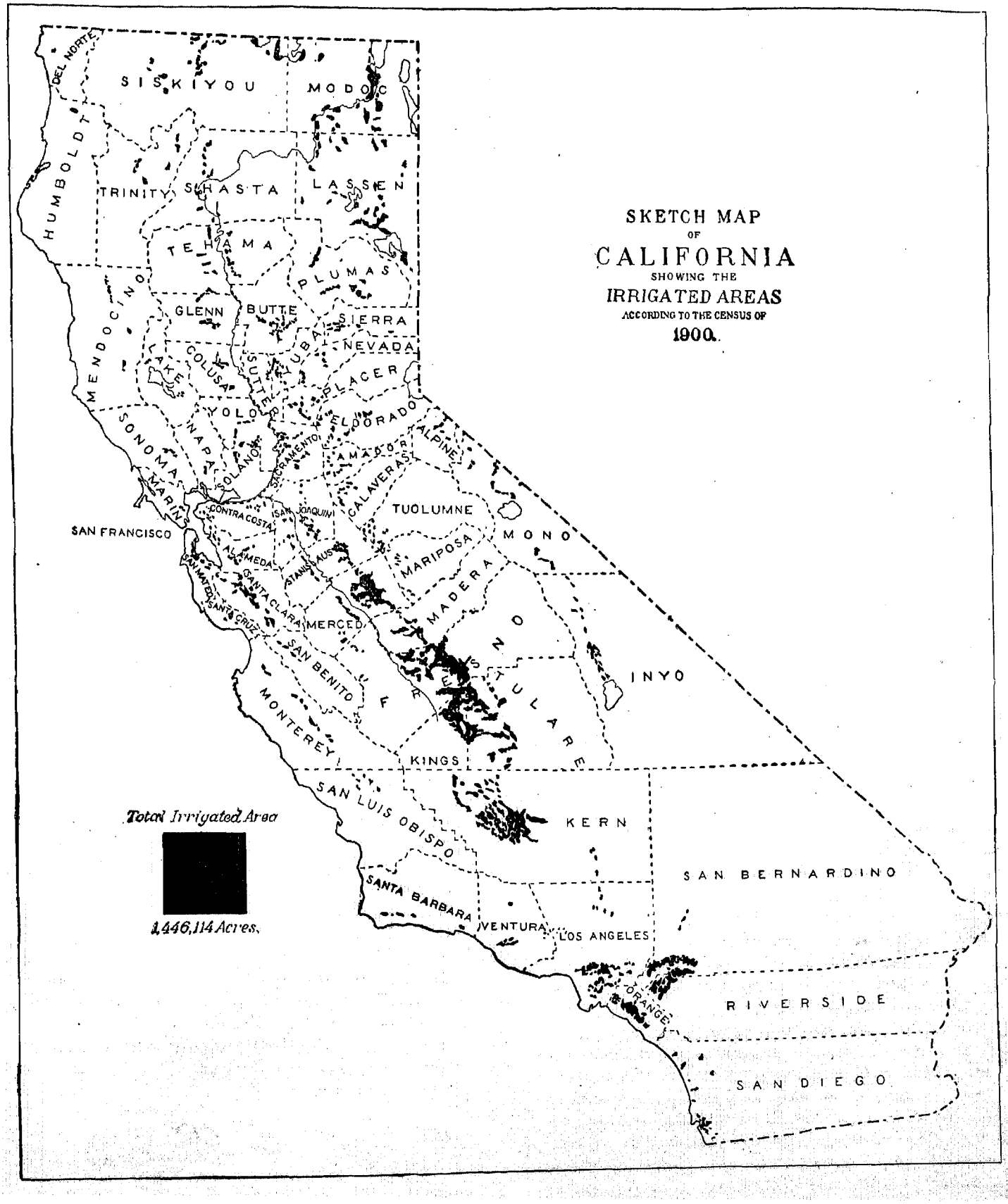
The statistics presented in this bulletin will be treated in greater detail in the final report on agriculture in the United States, which will be published about June 1, 1902. The present publication is designed to present a summarized advance statement for California.

Very respectfully,

L. G. Powers.

Chief Statistician for Agriculture.

OP 15M


SKETCH MAP
OF
CALIFORNIA
SHOWING THE
IRRIGATED AREAS
ACCORDING TO THE CENSUS OF
1900.
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
LAKE
COLUSA
SUTTER
YUBA
PLACER
YOLO
EL DORADO
ALPINE
SONOMA
NAPA
SOLANO
SACRAMENTO
AMADOR
CALAVERAS
MARIN
CONTRA COSTA
SAN JOAQUIN
TUOLUMNE
MONO
SAN FRANCISCO
ALAMEDA
STANISLAUS
MARIPOSA
SAN MATEO
SANTA CLARA
SANTA CRUZ
MERCED
MADERA
INYO
SAN BENITO
FRESNO
TULARE
MONTEREY
KINGS
SAN LUIS OBISPO
KERN
SAN BERNARDINO
SANTA BARBARA
VENTURA
LOS ANGELES
ORANGE
RIVERSIDE
SAN DIEGO
Total Irrigated Area
1,446,114 Acres.

AGRICULTURE IN CALIFORNIA.

GENERAL STATISTICS.

California, the second largest state in the Union, has a total land area of 155,980 square miles, or 99,827,200 acres, of which 28,828,951 acres, or 28.9 per cent, are included in farms.

The northern part of the state is rugged and mountainous, but contains some fertile valleys of small size. From this region two mountain ranges extend southward, one along the coast and the other along the eastern boundary. Between these two ranges lie the Sacramento and San Joaquin valleys, comprising the largest body of farming land in the state. In the south the surface becomes more even, the coast mountains almost disappearing.

The soil of the northern valleys is very rich, but the mountains are generally wooded, and suitable only for grazing purposes. The soils of the Sacramento and San Joaquin valleys vary from a sandy loam to heavy clay, and are everywhere fertile. The southern part of the state is generally arid, but under an extensive system of irrigation the land has become exceedingly productive and valuable.

The diversity in the soil and in the climate of California renders possible a greater variety of agricultural products than is found in any other state of the Union.

NUMBER AND SIZE OF FARMS.

Table 1 gives, by decades since 1850, the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1850 TO 1900.

YEAR.	Number of farms.	NUMBER OF ACRES IN FARMS.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.	Average.	
1900	72,542	28,828,951	11,958,837	16,870,114	397.4	41.5
1890	52,894	21,427,293	12,222,889	9,204,454	405.1	57.0
1880	35,924	16,538,742	10,669,698	5,924,044	461.8	64.3
1870	23,724	11,427,105	6,218,133	5,208,972	481.7	54.4
1860	18,716	8,790,084	2,468,084	6,202,000	466.4	28.3
1850	872	3,888,985	32,454	3,861,531	[a]4,465.0	0.8

Most of the farms reported in 1850 were cattle ranches operated by Mexicans under Spanish land grants. The discovery of gold in 1849, and the subsequent rapid immigration, resulted in abnormally high prices for farm produce and in a marked development of agriculture. The great increase in the area of improved farm land in the decade from 1850 to 1860 marks the real beginning of agriculture in California.

Since 1860 the number of farms has increased steadily, the rate of gain for the last decade being 37.1 per cent. The total area in farms, also, increased rapidly, from entry on the public domain and purchase or lease of railway subsidy lands. The increase in the area of improved farm land has kept pace with the general advancement, although, on account of the adoption by recent censuses of a stricter definition of the term "improved land," and the conversion of agricultural land into cattle ranches, a decrease is shown for the last decade. The average size of farms has decreased as intensive cultivation has become more general, and as special branches of agriculture have been developed.

FARM PROPERTY AND PRODUCTS.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year, beginning with 1850.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND OF FARM PRODUCTS: 1850 TO 1900.

YEAR.	Total value of farm property.	Land, improvements, and buildings.	Implements and machinery.	Live stock.	Farm products.[1]
1900	$796,527,955	$707,912,980	$21,811,670	$67,803,325	$181,690,605
1890	772,065,570	697,116,080	14,682,710	[2]60,259,230	87,033,290
1880	305,999,443	262,051,282	8,447,744	[2]35,500,417	59,721,425
1870[3]	184,521,470	141,240,028	5,816,690	37,964,752	[4]49,856,024
1860	86,870,327	48,726,804	2,568,200	35,585,017	----------
1850	7,328,582	3,874,041	103,488	3,351,058	----------

[1] For year preceding that designated.
[2] Exclusive of the value of animals on ranges.
[3] Values for 1870 were reported in depreciated currency. To reduce to specie basis of other figures, they must be diminished by one-fifth.
[4] Includes betterments and additions to live stock.

The total value of farm property increased very rapidly until 1890, but for the succeeding decade a gain of only 3.2 per cent is shown. This small increase is doubtless due in part to the financial disturbances in 1893, and the subsequent period of depression, as the very substantial gain made in the value of farm products furnishes conclusive evidence that the agricultural interests of the state are not declining. The value of land, improvements, and buildings increased 1.5 per cent from 1890 to 1900. The value of implements and machinery increased 45.1 per cent and that of farm products 51.3 per cent, a portion of each increase being, doubtless, the result of a more detailed enumeration in 1900 than heretofore. In the same period the value of live stock increased 11.7 per cent.

The low value of land, improvements, and buildings in 1850 and the high value of live stock, which nearly equalled that of all other forms of farm property, were due to the conditions explained above. The decreasing percentage of the total value of farm property represented by the value of live stock, and the rapidly increasing relative value of implements and machinery, reflect the gradual transition from grazing and stock raising in general to intensive cultivation of the soil.

COUNTY STATISTICS.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUES OF FARM PROPERTY.				Value of products not fed to live stock.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
The State	72,542	69,267	28,828,951	11,958,837	$630,444,960	$77,468,000	$21,311,670	$67,303,325	$118,202,036	$25,845,120	$937,050
Alameda	2,787	2,713	398,289	226,118	28,751,590	3,485,310	780,040	1,602,596	4,190,601	989,680	15,180
Alpine	37	37	15,681	4,391	198,100	45,400	10,810	70,131	61,011	6,970	
Amador	560	554	214,024	48,936	2,185,150	495,630	127,180	510,890	479,830	84,870	2,140
Butte	1,179	1,150	677,080	302,029	12,460,530	1,434,870	439,390	1,200,614	2,910,288	617,900	21,150
Calaveras	575	572	212,820	41,492	1,393,510	427,190	89,030	425,929	385,182	78,350	840
Colusa	582	569	550,002	358,227	10,885,350	838,420	417,690	913,028	3,023,958	611,760	8,640
Contra Costa	1,511	1,483	406,563	262,617	15,563,110	1,675,790	404,590	2,240,897	2,656,274	690,010	10,990
Del Norte	131	129	33,115	9,787	637,830	121,840	35,180	176,240	184,553	38,440	
Eldorado	759	757	209,320	45,481	1,546,240	666,120	116,320	361,894	543,446	71,600	2,010
Fresno	3,290	3,171	1,284,736	786,837	34,201,530	3,092,140	1,593,890	3,941,919	6,671,875	1,571,010	39,870
Glenn	529	513	577,363	355,782	8,473,830	719,510	299,620	806,340	1,934,303	403,170	60
Humboldt	1,500	1,484	648,511	77,238	9,524,850	1,282,880	311,020	2,123,049	1,916,256	363,880	8,760
Inyo	424	392	141,059	43,740	1,594,750	317,060	95,590	574,229	594,846	59,750	90
Kern	1,098	1,021	1,571,106	324,031	10,404,540	664,120	347,040	2,829,825	1,910,723	814,020	4,420
Kings	932	855	387,505	262,148	3,420,410	811,920	348,330	1,341,247	1,974,900	486,780	920
Lake	723	706	212,176	41,414	2,419,280	524,180	111,420	440,210	532,491	75,970	170
Lassen	555	550	381,109	183,266	2,949,510	708,010	255,220	1,452,875	652,646	314,790	8,700
Los Angeles	6,577	6,062	895,663	518,744	64,189,220	6,702,710	1,433,050	2,492,666	7,527,530	1,490,310	200,310
Madera	523	517	484,659	277,721	4,558,770	433,050	214,100	683,974	1,301,834	283,990	800
Marin	482	461	322,874	47,583	8,330,450	914,020	207,110	1,414,931	1,518,299	330,900	4,000
Mariposa	381	370	160,156	14,003	752,090	207,040	59,960	308,461	211,222	25,450	420
Mendocino	1,452	1,420	742,924	78,907	5,840,250	1,081,090	219,630	1,446,546	1,570,504	255,450	5,330
Merced	999	974	1,702,967	618,876	18,449,650	984,040	501,480	2,701,689	2,680,958	847,190	4,730
Modoc	688	623	298,755	122,647	2,825,360	521,900	174,200	1,842,367	1,097,713	143,320	4,280
Mono	112	104	183,068	65,288	519,040	87,380	26,340	542,983	332,952	28,560	500
Monterey	1,850	1,785	1,087,092	378,605	15,632,700	1,358,700	502,400	1,920,942	2,852,901	572,080	2,920
Napa	1,336	1,319	319,327	111,986	8,925,780	2,181,590	357,980	871,696	1,345,705	329,890	12,690
Nevada	522	518	120,748	24,898	1,116,900	447,640	102,910	280,030	421,769	51,600	5,430
Orange	2,388	2,310	599,486	286,847	18,533,640	2,177,040	456,500	1,179,415	2,549,777	447,010	16,520
Placer	1,076	1,028	440,371	121,063	4,839,730	998,620	222,060	487,351	1,407,787	259,560	13,680
Plumas	267	259	184,449	57,351	1,211,530	387,010	97,240	544,036	420,959	118,070	70
Riverside	2,340	1,949	427,097	216,033	18,488,110	1,999,850	399,280	756,791	3,029,158	580,670	208,010
Sacramento	1,392	1,303	608,426	327,159	15,189,870	2,159,630	528,780	1,448,346	4,608,388	976,560	2,190
San Benito	907	885	512,719	168,698	7,057,190	852,340	272,030	935,498	1,034,360	168,320	3,620
San Bernardino	2,350	1,978	219,132	96,920	21,000,370	2,578,120	395,880	687,052	2,364,492	599,700	151,320
San Diego	2,698	2,566	809,419	229,791	14,133,990	2,170,180	533,980	1,508,517	1,824,665	416,010	22,980
San Francisco	304	298	8,219	3,829	1,855,030	228,100	71,200	253,563	1,025,600	249,070	5,600
San Joaquin	1,966	1,920	751,065	652,923	25,769,590	2,297,180	907,410	2,244,294	6,134,421	1,214,290	20,760
San Luis Obispo	1,813	1,774	1,084,480	412,366	11,138,180	1,272,820	479,840	1,749,917	2,211,273	688,640	2,200
San Mateo	551	544	149,944	72,429	8,201,140	1,833,390	273,600	646,726	1,124,795	199,190	2,070
Santa Barbara	1,149	1,116	922,611	202,982	14,849,440	1,375,290	365,770	1,681,363	2,695,342	437,370	8,870
Santa Clara	3,995	3,748	710,686	290,285	42,270,340	5,832,710	1,287,560	1,834,093	6,195,605	1,366,480	25,490
Santa Cruz	1,274	1,244	160,438	62,849	9,094,410	1,452,020	246,980	649,790	2,008,213	419,230	1,450
Shasta	1,221	1,191	347,120	86,540	2,980,620	588,500	163,450	787,853	837,270	100,970	990
Sierra	141	131	74,609	26,687	564,990	179,770	37,480	213,155	208,428	32,680	1,310
Siskiyou	931	922	452,859	181,029	5,084,110	1,056,390	284,520	1,279,749	1,891,881	255,480	3,890
Solano	1,151	1,115	480,551	344,058	16,903,310	1,935,970	649,320	1,321,834	4,014,705	845,660	17,700
Sonoma	3,676	3,521	785,064	221,374	25,286,750	4,646,580	847,240	2,291,137	5,045,239	1,015,320	12,030
Stanislaus	951	911	830,692	622,700	13,674,850	1,287,900	587,280	1,581,920	2,852,875	621,760	1,570
Sutter	728	694	293,287	206,877	6,976,320	987,700	313,780	904,931	1,857,801	298,760	1,000
Tehama	1,055	1,030	950,753	269,693	11,720,120	2,091,860	440,020	1,778,104	1,971,266	514,330	15,720
Trinity	272	258	76,038	14,144	583,450	171,550	31,180	254,689	157,720	33,560	170
Tulare	2,212	2,105	1,059,727	546,289	15,898,600	1,376,960	715,450	2,296,791	3,150,503	777,240	8,900
Tuolumne	457	457	204,758	36,461	1,284,260	397,850	102,070	346,965	423,742	51,110	2,220
Ventura	1,269	1,236	552,359	174,419	18,549,290	1,491,250	482,270	910,677	2,612,110	668,070	8,780
Yolo	1,214	1,174	552,065	351,213	15,906,280	1,985,590	510,480	1,637,451	3,427,923	681,530	16,110
Yuba	488	480	312,321	154,013	3,375,150	637,130	151,650	589,638	879,308	242,950	1,700
Hupa Valley[1]	88	87	5,784	1,055	66,150	15,880	9,430	24,325	24,136	1,600	
Mission[1]	53	50	1,528	1,048	32,400	6,470	3,110	7,825	2,975	730	
Round Valley[1]	118	113	4,767	2,778	107,180	54,180	11,210	41,490	19,897	290	300
Tule River[1]	28	26	5,045	363	13,190	2,110	1,670	13,291	5,507	190	

[1] Indian reservation.

During the past decade the number of farms increased rapidly in nearly all counties. In San Francisco and Tuolumne counties the number of farms reported in 1900 was more than double that of ten years before, and in Inyo, Siskiyou, and Los Angeles counties the gains were nearly as great. Seven counties show decreases, but, with the exception of Colusa and Amador, whose losses are 43.4 and 20.0 per cent, respectively, they were all comparatively slight. The decrease in Colusa county was doubtless due to a change in boundary since 1890.

The total area of farm land in the state is 34.5 per cent greater than in 1890. In Tuolumne, San Francisco, Mono, Orange, Kern, and Inyo counties the farm area more than doubled. Of the decreases shown, the largest were for Colusa and San Bernardino counties.

The percentage of farm land improved was less than it was in 1890 in all counties except in those showing marked increases in total farm acreage, and in a few counties around the cities of San Francisco and Los Angeles. A comparison with the figures for 1890 shows a gain in the

total acreage devoted to crops in nearly all counties, even in those showing the greatest decreases in improved land.

A lower value of land and buildings than in 1890 is reported for all counties except Los Angeles, Ventura, and Santa Barbara in the southwest; San Joaquin, Calaveras, and most of the counties bordering upon San Francisco Bay, in the central part; and Sierra, Plumas, Lassen, Modoc, and Siskiyou counties in the northeast. These counties are, as a rule, adapted to the growing of fruits and vegetables, while the other parts of the state are devoted, in general, to hay and forage and to live-stock raising.

The value of implements and machinery has increased since 1890 in every county except Colusa, Butte, Amador, and Yuba, which show decreases of 43.7, 18.5, 14.8, and 10.7 per cent, respectively. The largest relative gains are in those counties where fruit raising and dairying are the leading branches of agriculture.

The total value of live stock has increased 11.7 per cent, the largest relative increase being in Tuolumne county. The general agricultural progress of this county in the past ten years, which has been very marked, is probably due to its large relative increase in population.

The average expenditure per farm for labor was $356 for the state, and ranged from $67 in Mariposa county to $1,051 in Colusa county. In the latter county $1.11 was expended for every acre of farm land. The average was highest in San Francisco county, where it amounted to $30.30 per acre.

The amount expended for fertilizers in 1900 was more than six times as great as it was ten years before. Large increases were shown for all counties except San Francisco and Shasta. As a rule, the counties reporting the largest acreages in fruits reported also the highest average expenditures for both labor and fertilizers.

INCREASE IN THE NUMBER OF FARMERS IN CALIFORNIA.

From 1850 to 1900 the population of California increased from 92,597 to 1,485,053, or sixteenfold, while the number of farms increased from 872 to 72,542, or over eightyfold. In other words, from 1850 to 1900 the number of farms, and hence the number of persons operating them as owners or tenants, increased faster than the population. This statement applies also to the decades, 1850 to 1860, 1870 to 1880, and 1890 to 1900.

Data showing, with any exactness, the relative increases in the various classes of the farm population are available for only a portion of the fifty years covered by the foregoing comparisons. That portion is the period from 1870 to 1890, during which time the number of farms, and hence of farm owners and tenants, increased approximately 123.0 per cent, while the total state population increased but 115.6 per cent. During the same period the number of males engaged in agriculture increased from 47,580 to 126,711, a gain of 166.3 per cent, which represents approximately the rate of increase in the total number of persons living on farms; and the number of males working for wages on farms increased from 16,156 to 51,532, or 219.0 per cent. These figures show that, in the period mentioned, California was one of the few states that added more to its agricultural than to its other population. Of the different classes of farming population the gain was largest among those working for wages, although the numbers of farm owners and tenants increased faster than the total population. This increase in the number of those working for wages in California was incidental to the introduction of more intensive methods of cultivation, and to the development of such special branches of agriculture as fruit growing, in which California now leads. The beginnings of these changes were made by the owners of the large ranches into which the entire farming area of California was originally divided.

In the last decade the number of farms, and hence, of owners and tenants, increased 37.1 per cent, while the total rural population increased but 12.7 per cent. This indicates that in the last ten years, unlike the two decades preceding, the number of persons operating farms as owners or tenants increased faster than the number of those who worked for wages. The more intensive cultivation of the soil and the growing of fruit, which were introduced between 1870 and 1890 by large capitalists who employed many hired laborers, seem now to be passing to a considerable extent into the hands of smaller farmers, who, as owners or tenants, manage and cultivate their lands in person. The following statistics of farm tenure, if studied in connection with the statistics of population for 1900, already published, and those of occupations, now being tabulated by the division of population, will throw much light upon the changes which have taken place in the social and economic condition of the agriculturists of this state.

FARM TENURE.

Table 4 gives a comparative exhibit for 1880, 1890, and 1900, of the number of farms operated by owners, cash tenants, and share tenants. Table 4*a* presents, for the two decades covered by Table 4, the per cent of increase in rural population, in the total number of farms, and in the number of farms of specified tenures. In Table 5 the tenure of farms for 1900 is given by race of farmer, and the farms operated by owners are subdivided into groups designated as farms operated by "owners," "part owners," "owners and tenants," and "managers." These groups comprise, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it, and the other, or others, owning no part, but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

The farms operated by tenants are divided into groups designated as farms operated by "cash tenants" and farms operated by "share tenants." These groups comprise,

respectively: (1) Farms operated by individuals who pay a cash rental, or a stated amount of labor or farm produce; and (2) farms operated by individuals who pay as rental a stated share of the products.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES: 1880 TO 1900.

YEAR.	Total number of farms.	NUMBER OF FARMS OPERATED BY—			PER CENT OF FARMS OPERATED BY—		
		Owners.[1]	Cash tenants.	Share tenants.	Owners.[1]	Cash tenants.	Share tenants.
1900	72,542	55,782	9,074	7,686	76.9	12.5	10.6
1890	52,894	43,489	4,574	4,831	82.2	8.7	9.1
1880	35,934	28,810	3,209	3,915	80.2	8.9	10.9

[1] Including "part owners," "owners and tenants," and "managers."

TABLE 4a.—PER CENT OF INCREASE IN RURAL POPULATION, IN THE TOTAL NUMBER OF FARMS, AND IN THE NUMBER OF FARMS OF SPECIFIED TENURES, FOR THE DECADES, 1880 TO 1890 AND 1890 TO 1900, AND FOR THE TWENTY-YEAR PERIOD, 1880 TO 1900.

PERIOD.	PER CENT OF INCREASE IN—					
	Rural population.	Total number of farms.	Number of farms operated by—			
			All owners.	All tenants.	Cash tenants.	Share tenants.
1890-1900	12.7	37.1	28.3	78.2	98.4	59.1
1880-1890	26.6	47.2	51.0	32.0	42.5	23.4
1880-1900	42.7	101.9	93.6	185.3	182.8	96.3

TABLE 5.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.

PART 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE.	Total number of farms.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
The State	72,542	44,009	8,211	309	3,253	9,074	7,686
White	70,935	43,298	8,165	306	3,224	8,407	7,535
Colored	1,607	711	46	3	29	667	151
Chinese	777	29	7	----	16	620	105
Indian	658	596	30	3	8	10	12
Japanese	87	4	----	----	1	22	10
Negro	135	83	9	----	4	15	24

PART 2.—PER CENT OF FARMS OF SPECIFIED TENURES.

The State	100.0	60.7	11.3	0.4	4.5	12.5	10.6
White	100.0	61.0	11.5	0.4	4.6	11.9	10.6
Colored	100.0	44.2	2.9	0.2	1.8	41.5	9.4

The percentages shown in Table 4*a* indicate a marked improvement, in the last two decades, in the social and economic condition of the California farmer. During this period great additions were made to the rural population, partly by immigration from other states and from foreign countries. The number of farms operated by owners increased 93.6 per cent, and the number operated by tenants 135.3 per cent, the former showing the greater increase from 1880 to 1890 and the latter from 1890 to 1900. Had the number of farms operated by owners increased only as fast as the rural population, the number of such farms in 1900 would have been less than it was by 14,670. The gain in the number of tenants, above the gain that would have been made had the rate of increase been the same as that for rural population, was 6,596. A part of this increase, relatively large, in the number of farm owners and tenants since 1880 is doubtless due to the fact that the increase in the number of persons engaged in agriculture was greater than in the number of those employed in lumbering, mining, and kindred occupations. The change shown by these figures, in the average condition of persons working on farms, is the opposite of that reflected in the occupation tables of 1870 to 1890, which showed a greater increase in the number of farm laborers than in the number of owners and tenants.

Table 5 shows that 1,607, or but 2.2 per cent, of the farms of the state are operated by colored farmers. Of the white farmers 72.9 per cent own all or a part of the farms they operate, and 27.1 per cent operate farms owned by others. For colored farmers the corresponding percentages are 47.3 and 52.7.

Chinese farmers are nearly all tenants, and as a rule pay a cash rental. The Indians generally own the farms they operate.

No previous census has reported the number of farms operated by "part owners," "owners and tenants," or "managers," but it is believed that the number conducted by the last-named class is constantly increasing.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY TENURE, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	72,542	397.4	28,828,951	100.0	$796,527,955	100.0
White farmers	70,935	404.0	28,658,311	99.4	787,610,449	98.9
Colored farmers	1,607	106.2	170,640	0.6	8,917,506	1.1
Chinese	777	101.2	78,609	0.3	7,164,287	0.9
Indian	658	95.1	62,606	0.2	713,262	0.1
Japanese	87	124.1	4,503	(1)	545,661	0.1
Negro	135	183.9	24,832	0.1	494,296	(1)
Owners	44,009	229.8	10,114,649	35.1	337,425,462	42.4
Part owners	8,211	600.8	4,933,421	17.1	124,467,344	15.6
Owners and tenants	309	459.1	141,875	0.5	3,823,782	0.5
Managers	3,253	2,152.5	7,002,038	24.3	141,116,829	17.7
Cash tenants	9,074	329.9	2,993,879	10.4	89,247,117	11.2
Share tenants	7,686	474.0	3,643,089	12.6	100,447,471	12.6

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

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$8,690	$1,068	$294	$928	$1,629	14.8
White farmers	8,779	1,084	297	943	1,682	14.7
Colored farmers	4,777	354	160	258	1,530	27.6
Chinese	8,300	467	226	227	2,807	30.4
Indian	628	146	58	257	173	16.0
Japanese	11,804	1,782	899	262	2,181	14.8
Negro	2,790	326	102	443	622	17.0
Owners	5,810	1,000	221	635	1,119	14.6
Part owners	12,251	1,215	462	1,231	2,391	15.8
Owners and tenants	9,546	1,285	472	1,135	2,050	16.6
Managers	35,185	3,157	816	4,273	5,411	12.5
Cash tenants	7,951	723	219	942	1,649	16.8
Share tenants	11,082	812	395	830	2,101	16.1

Of the farms of the state 97.8 per cent are operated by white farmers and 2.2 per cent by colored farmers. The average values of the various forms of farm property and the average value of products are much lower for farms operated by colored farmers than for those operated by white farmers. The higher percentage of gross income for colored farmers is largely due to the fact that the farms operated by Chinese and Japanese are nearly all intensively cultivated vegetable farms, vineyards, orchards, etc. The percentages for farms of negroes and Indians do not differ widely from those shown for white farmers.

The average values shown for farms operated by Chinese and Japanese are very high, but it should be borne in mind that very few of the Chinese and Japanese own the farms they operate, and that the farms which they do own have very much lower average values than the farms which they rent.

The farms conducted by managers have larger average areas and higher average values of property and products than the farms of any other group by tenure. The large ranches, vineyards, and orchards of which this group is chiefly composed represent greater investments, and their operation generally requires more capital, than the average farmer can command. Men wealthy enough to own such farms rarely operate them in person.

FARMS CLASSIFIED BY AREA.

Tables 8 and 9 present the principal statistics for farms classified by area.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

AREA.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	72,542	397.4	28,828,951	100.0	$796,527,955	100.0
Under 3 acres	1,492	2.3	3,481	(1)	3,189,393	0.4
3 to 9 acres	5,354	6.4	34,075	0.1	16,451,400	2.1
10 to 19 acres	8,236	13.0	106,883	0.4	37,981,195	4.8
20 to 49 acres	18,110	29.4	385,844	1.3	76,286,267	9.6
50 to 99 acres	8,067	71.7	578,102	2.0	64,160,713	8.0
100 to 174 acres	13,196	147.4	1,945,423	6.7	83,154,197	10.4
175 to 259 acres	4,635	212.6	985,507	3.4	45,909,915	5.8
260 to 499 acres	8,370	360.0	3,012,949	10.5	98,297,282	12.3
500 to 999 acres	5,329	691.5	3,685,027	12.8	99,489,775	12.5
1,000 acres and over	4,753	3,806.4	18,091,660	62.8	271,661,888	34.1

(1) Less than one-tenth of 1 per cent.

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$8,690	$1,068	$294	$928	$1,629	14.8
Under 3 acres	1,023	630	53	432	592	27.7
3 to 9 acres	2,091	765	82	135	432	14.1
10 to 19 acres	3,508	819	120	165	627	13.6
20 to 49 acres	4,594	819	164	242	865	14.9
50 to 99 acres	6,407	987	235	374	1,244	15.6
100 to 174 acres	4,890	729	200	482	1,026	16.3
175 to 259 acres	7,846	1,023	310	726	1,640	16.6
260 to 499 acres	9,185	1,166	370	1,023	1,852	15.8
500 to 999 acres	14,910	1,518	536	1,696	2,881	15.4
1,000 acres and over	46,219	3,195	1,205	6,587	7,678	18.4

The group of farms each containing 1,000 acres or over comprises more than one-third of the total value of farm property and nearly two-thirds of the total farm acreage.

With a few exceptions the average values of the several forms of farm property and products increase with the size of the farm. The high average value of live stock for farms under 3 acres is due to the fact that some of them are stock farms using ranges and a large number are city dairies. The high average and percentage of gross income shown for this group are due to the fact that, in addition to these stock farms and dairies, it includes 125 florists' establishments. It should be borne in mind that the incomes from dairies and florists' establishments are determined not so much by the acreage of land used as by the amount of capital invested in buildings, implements, and

live stock, and the amounts expended for labor and fertilizers.

The average gross incomes per acre for the various groups classified by area are as follows: Farms under 3 acres, $253.89; 3 to 9 acres, $67.86; 10 to 19 acres, $48.39; 20 to 49 acres, $29.40; 50 to 99 acres, $17.35; 100 to 174 acres, $6.96; 175 to 259 acres, $7.71; 260 to 499 acres, $5.14; 500 to 999 acres, $4.17; 1,000 acres and over, $2.02.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

In Tables 10 and 11 the farms are classified by principal source of income. If the value of the hay and grain raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of products not fed to live stock, the farm is classified as a "hay and grain" farm. If vegetables are the leading crop, constituting 40 per cent of the value of the products, it is a "vegetable" farm. The farms of the other groups are classified in accordance with the same general principle. "Miscellaneous" farms are those whose operators do not derive 40 per cent of their income from any one class of farm products. Farms which yielded no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

PRINCIPAL SOURCE OF INCOME.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	72,542	397.4	28,828,951	100.0	$796,527,955	100.0
Hay and grain	19,048	533.0	10,151,913	35.2	271,527,804	34.1
Vegetables	3,045	89.0	270,936	0.9	18,596,019	2.3
Fruits	18,587	96.0	1,780,122	6.2	214,856,477	27.0
Live stock	15,418	812.3	12,523,729	43.5	157,285,289	19.7
Dairy produce	8,686	274.8	2,387,154	8.3	76,204,051	9.6
Sugar	386	179.0	69,098	0.2	6,542,053	0.8
Flowers and plants	208	8.3	1,726	(1)	1,280,281	0.2
Nursery products	141	47.4	6,689	(1)	1,781,188	0.2
Miscellaneous[2]	7,073	231.5	1,637,584	5.7	48,455,193	6.1

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

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$8,690	$1,068	$294	$928	$1,629	14.8
Hay and grain	11,747	1,119	425	962	2,109	14.8
Vegetables	5,083	578	172	278	1,559	25.5
Fruits	9,609	1,386	325	272	1,670	14.4
Live stock	7,203	863	207	1,928	1,453	14.2
Dairy produce	6,445	979	218	1,130	1,226	14.0
Sugar	15,871	684	859	535	3,575	21.1
Flowers and plants	8,684	2,248	177	46	2,856	46.4
Nursery products	10,749	1,492	257	134	3,749	29.7
Miscellaneous[1]	5,351	839	193	468	966	14.1

[1] Including 1 tobacco farm.

For the several classes of farms the average values per acre of products not fed to live stock are: Flowers and plants, $344.16; nursery products, $79.03; sugar, $19.97; vegetables, $17.51; fruit, $17.35; dairy produce, $4.46; miscellaneous, $4.17; hay and grain, $3.96; tobacco, $2.32; and live stock, $1.79. The wide variations in the averages and percentages of gross income are due largely to the fact that in computing gross income no deductions are made for expenses involved in operation. For florists' establishments, nurseries, and market gardens the average expenditure for such items as labor and fertilizers represents a far greater percentage of the gross income than in the case of hay and grain, live-stock, or miscellaneous farms. If it were possible to present the average net income, the variations shown would probably be comparatively slight.

FARMS CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Tables 12 and 13 present data relating to farms classified by the reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	72,542	397.4	28,828,951	100.0	$796,527,955	100.0
$0	2,150	210.5	452,595	1.6	10,559,450	1.3
$1 to $49	2,516	114.9	289,203	1.0	6,039,600	0.8
$50 to $99	3,526	108.4	382,222	1.3	8,851,150	1.1
$100 to $249	10,385	119.7	1,242,669	4.3	32,246,390	4.1
$250 to $499	12,237	137.3	1,680,105	5.8	50,848,350	6.4
$500 to $999	13,979	185.8	2,597,321	9.0	83,649,170	10.5
$1,000 to $2,499	16,077	351.7	5,653,524	19.6	175,544,190	22.0
$2,500 and over	11,672	1,416.3	16,531,312	57.4	428,789,656	53.8

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$8,690	$1,068	$294	$928	$1,629	14.8
$0	3,987	413	75	367		
$1 to $49	1,830	386	64	144	42	1.7
$50 to $99	1,825	437	75	170	74	2.9
$100 to $249	2,243	541	94	226	167	5.4
$250 to $499	3,029	672	131	323	360	8.7
$500 to $999	4,490	813	187	496	711	11.9
$1,000 to $2,499	8,603	1,148	307	868	1,505	13.8
$2,500 and over	29,938	2,606	908	3,288	6,646	18.1

Many of the farms reporting no income for 1899 were fruit farms with trees or vines too young to bear; some were country homes of business or professional men; while others were homesteads taken up shortly prior to the date

of enumeration. There were some farms, also, from which no reports of the products of 1899 could be secured because the persons in charge, June 1, 1900, did not operate the farms in 1899. To this extent the reports fall short of giving a complete exhibit of farm income in 1899.

LIVE STOCK.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the Twelfth Census.

The age grouping for neat cattle was determined by their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with the figures published in previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS.

LIVE STOCK.	Age in years.	ON FARMS.			NOT ON FARMS.
		Number.	Value.	Average value.	Number.
Calves	Under 1	329,430	$2,796,201	$8.49	4,478
Steers	1 and under 2	134,902	2,296,430	17.02	798
Steers	2 and under 3	109,168	2,722,526	24.94	991
Steers	3 and over	36,310	2,790,313	82.39	5,994
Bulls	1 and over	24,725	845,470	34.19	476
Heifers	1 and under 2	148,259	2,696,263	18.18	1,867
Cows kept for milk	2 and over	307,245	10,789,070	34.95	19,511
Cows and heifers not kept for milk.	2 and over	304,450	7,762,893	25.50	984
Colts	Under 1	28,049	423,427	18.37	724
Horses	1 and under 2	24,639	763,613	30.99	627
Horses	2 and over	373,605	16,657,953	44.59	92,820
Mule colts	Under 1	5,035	104,787	20.81	63
Mules	1 and under 2	6,469	247,975	38.33	84
Mules	2 and over	73,269	4,258,147	58.12	3,332
Asses and burros	All ages	2,227	146,697	65.87	560
Lambs	Under 1	838,385	1,579,388	1.88	4,515
Sheep (ewes)	1 and over	1,335,390	4,046,693	3.03	10,713
Sheep (rams and wethers).	1 and over	389,578	1,377,210	3.54	3,003
Swine	All ages	598,336	2,476,781	4.14	24,029
Goats	All ages	109,021	262,981	2.41	3,606
Fowls:[1]					
Chickens[2]		3,947,200	1,877,489		
Turkeys		158,850			
Geese		28,419			
Ducks		62,293			
Bees (swarms of)		129,444	363,885	2.81	
Value of all live stock.			67,242,112		

[1] The number reported is of fowls over 3 months old. The value is of all, old and young.
[2] Including Guinea fowls.

The total value of all live stock on farms and ranges, June 1, 1900, was $67,242,112. Of this amount the value of horses constituted 26.5 per cent; dairy cows, 16.0 per cent; other neat cattle, 32.6 per cent; sheep, 10.4 per cent; mules and asses, 7.1 per cent; swine, 3.7 per cent; poultry, 2.8 per cent; and all other live stock, 0.9 per cent.

No reports were received of the value of animals not on farms, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, however, the total value of all live stock in the state, exclusive of poultry and bees not on farms, is approximately $72,827,000.

CHANGES IN LIVE STOCK KEPT ON FARMS.

The following table shows the changes since 1850 in the numbers of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS AND RANGES: 1850 TO 1900.

YEAR.	Dairy cows.	Other neat cattle.	Horses.	Mules and asses.	Sheep.[1]	Swine.
1900	307,245	1,137,379	421,293	87,030	1,724,968	598,336
1890[2]	317,201	1,349,917	399,852	53,848	2,475,140	581,899
1880[2]	210,078	454,229	237,710	28,343	4,152,349	603,550
1870	164,993	407,305	192,278	17,533	2,768,187	444,017
1860	205,407	974,735	160,610	3,681	1,088,002	456,399
1850	4,280	258,379	21,719	1,666	17,674	2,776

[1] Lambs not included.
[2] Exclusive of animals on ranges.

The live-stock enumerations in 1880 and in 1890 did not include domestic animals on ranges, and hence the figures for those years presented in the table are not strictly comparable with the figures for 1900. The number of animals on ranges in 1890 was estimated by special agents to be as follows: All neat cattle, 241,300; horses, 22,542; mules and asses, 1,499; sheep, 897,896; swine, 9,110. In comparing the number of animals reported in 1900 with the number reported in 1890, these estimates are disregarded.

Since 1850 the number of dairy cows has increased more than seventyfold, but a decrease of 3.1 per cent is shown for the last decade. It is probable that this decrease is more apparent than real, as many of the 304,450 "cows and heifers not kept for milk" were doubtless milch cows dry at the time of enumeration. The fact that the production of milk has increased 38.2 per cent since 1890 supports this view.

The number of "other neat cattle" given for 1900 included 329,430 calves. It is uncertain whether or not calves were included in the reports for previous census years. If not, their number should be deducted from the total for 1900 when making comparisons with such reports. In that case a decrease since 1890 of 23.0 per cent would be shown in the number of "other neat cattle."

The numbers of horses and of mules and asses have steadily increased since 1850, the rates of gain for the last decade being 5.4 per cent for the former and 61.6 per cent for the latter. The number of sheep increased until 1880, since which date it has decreased, the loss for the last decade being 30.3 per cent. The number of swine has fluctuated from decade to decade, with a general upward tendency.

In comparing the poultry report for 1900 (see Table 14) with that of 1890, it should be borne in mind that in 1900 the enumerators were instructed not to report fowls less than 3 months old, while in 1890 no such limitation was made. This fact explains, to a great extent, the comparatively small increase in the number of chickens, and the following decreases in the number of other fowls: Geese, 24.5 per cent; turkeys, 45.0 per cent; and ducks, 60.5 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the products of the animal industry

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS IN 1899.

PRODUCTS.	Unit of measure.	Quantity.	Value.
Wool	Pounds	18,680,495	$1,737,088
Mohair and goat hair	Pounds	169,770	45,665
Milk	Gallons	[1]158,684,741	
Butter	Pounds	26,653,360	12,128,471
Cheese	Pounds	4,249,588	
Eggs	Dozens	24,443,540	3,864,679
Poultry			2,492,067
Honey	Pounds	3,667,738	381,930
Wax	Pounds	175,330	
Animals sold			13,365,755
Animals slaughtered			2,449,820
Total			36,324,894

[1] Includes all milk produced.

In 1899 the value of animal products was $36,324,894, or 30.7 per cent of the gross farm income. Of the above amount 43.4 per cent represents the value of animals sold and animals slaughtered on farms; 33.4 per cent, that of dairy produce; 17.5 per cent, that of poultry and eggs; 4.8 per cent, that of wool, mohair and goat hair; and 0.9 per cent, that of honey and wax.

DAIRY PRODUCE.

With respect to the number of farmers engaged in its pursuit, dairying holds fourth place among the various branches of California agriculture. Of the 72,542 farms of the state in 1900, 8,686, or 12.0 per cent, were dairy farms. The increase in the production of milk during the last decade was 42,493,555 gallons, or 38.2 per cent, although the population of the state increased but 22.7 per cent. The average production per capita for the state increased from 92.0 gallons in 1889 to 103.5 gallons in 1899. In Yolo, Calaveras, Trinity, and Stanislaus counties the gains were especially marked, the production in 1899 being between two and three times as great as that reported for 1889. Since 1880 the quantity of milk sold has increased 44,187,768 gallons, or over fourfold. These gains all support the conclusion that dairymen are not only keeping better cows, but devoting more care to their herds than they did ten years ago.

A comparison with the figures for 1890 shows a decrease of 22.1 per cent in the quantity of butter, and an increase of 9.8 per cent in the quantity of cheese, made on farms. In 1900 butter was reported by 32,088 farmers, who produced an average of 650 pounds per farm; cheese was reported by 420 farmers, but the average production per farm was 10,118 pounds.

Of the $12,128,471 given in Table 16 as the value of all dairy produce in 1899, $2,956,217, or 24.4 per cent, represents the value of dairy produce consumed on farms, and $9,172,254, or 75.6 per cent, the amount realized from sales. Of the latter amount, $5,847,591 was derived from the sale of 56,540,946 gallons of milk; $2,903,714, from 15,286,667 pounds of butter; $364,456, from 3,989,893 pounds of cheese; and $56,493, from 71,305 gallons of cream.

POULTRY AND EGGS.

The total value of the products of the poultry industry in 1899 was $6,356,746, of which amount 39.2 per cent represents the value of fowls raised and 60.8 per cent that of eggs produced. Nearly eleven million dozen more eggs were produced in 1899 than in 1889, the per cent of increase being 78.7.

WOOL.

The production of wool has decreased steadily since 1879. In the last decade the decrease was 2,678,052 pounds, or 16.4 per cent. The average weight per fleece, however, remained practically the same, having been 4.8 pounds in 1889 and 4.7 pounds in 1899. Lake, Tehama, and Shasta counties reported nearly one-half of the total number of fleeces of mohair and goat hair.

HONEY AND WAX.

The quantity of honey produced in 1899 was 3,667,738 pounds, a decrease of 262,151 pounds, or 6.7 per cent, from the production in 1889. The production of wax increased 91.5 per cent. The largest decreases in the production of honey were in the southernmost counties, where severe droughts injured the alfalfa and other food plants of the bee. There were marked increases in Fresno, Kern, and Tulare counties.

HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number of these animals, and the average number per farm. In computing the averages presented, only those farms which report the kind of stock under consideration are included.

TABLE 17.—HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS, JUNE 1, 1900.

CLASSES.	HORSES.			DAIRY COWS.		
	Farms reporting.	Number.	Average per farm.	Farms reporting.	Number.	Average per farm.
Total	63,611	421,298	6.6	49,189	307,245	6.2
White farmers	62,258	414,406	6.7	48,960	306,473	6.3
Colored farmers	1,353	6,887	5.1	229	772	3.4
Owners[1]	46,208	271,755	5.9	36,124	172,618	4.8
Managers	2,372	45,984	19.4	1,616	20,448	12.7
Cash tenants	7,951	45,776	5.8	5,941	88,152	14.8
Share tenants	7,085	57,828	8.2	5,508	26,027	4.7
Under 20 acres	10,945	21,022	1.9	6,924	16,218	2.3
20 to 99 acres	18,790	61,438	3.3	14,024	44,566	3.2
100 to 174 acres	11,794	61,088	5.2	9,028	38,443	4.3
175 to 259 acres	4,389	29,218	6.7	3,704	22,343	6.0
260 acres and over	17,743	248,532	14.0	15,514	185,675	12.0
Hay and grain	17,063	164,348	9.6	13,728	56,518	4.1
Vegetable	2,529	10,756	4.3	1,342	4,557	3.4
Fruit	16,104	53,999	3.6	9,715	20,180	2.1
Live stock	14,147	114,977	8.1	10,806	54,337	5.0
Dairy	3,117	42,901	5.3	8,686	153,307	17.6
Sugar	360	2,917	8.3	281	731	2.8
Miscellaneous[2]	6,281	31,395	5.0	4,651	17,615	3.8

[1] Includes "part owners" and "owners and tenants."
[2] Including 1 tobacco farm.

CROPS.

The following table gives the statistics of the principal crops of 1899.

TABLE 18.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

CROPS.	Acres.	Unit of measure.	Quantity.	Value.
Corn	58,930	Bushels	1,477,093	$700,894
Wheat	2,683,405	Bushels	36,534,407	20,179,044
Oats	153,734	Bushels	4,972,356	1,700,897
Barley	1,029,647	Bushels	25,149,335	10,645,723
Rye	62,925	Bushels	524,451	251,486
Buckwheat	395	Bushels	7,835	3,945
Kafir corn	20,218	Bushels	420,452	193,244
Flaxseed	904	Bushels	12,610	10,559
Clover seed		Bushels	14,409	67,550
Grass seed		Bushels	1,113	1,847
Hay and forage	2,239,601	Tons	3,035,982	19,436,398
Tobacco	27	Pounds	23,490	4,352
Hemp	500	Pounds	620,000	45,000
Hops	6,891	Pounds	10,124,660	925,319
Broom corn	1,669	Pounds	1,146,000	40,506
Peanuts	433	Bushels	15,461	12,650
Castor beans	7	Bushels	125	250
Dry beans	45,861	Bushels	658,515	1,022,586
Dry pease	2,014	Bushels	57,299	70,633
Potatoes	42,098	Bushels	5,242,596	2,637,528
Sweet potatoes	1,607	Bushels	239,029	135,612
Onions	2,207	Bushels	514,859	296,671
Sugar beets	41,242	Tons	856,535	1,550,346
Miscellaneous vegetables	30,194			2,562,161
Chicory	78	Pounds	135,500	4,260
Sorghum cane	140	Tons	[1] 6	10
Sorghum sirup		Gallons	8,671	3,778
Small fruits	6,353			911,411
Grapes	[2] 133,362	Centals	7,214,334	[3] 5,622,825
Orchard fruits	[2] 340,978	Bushels	22,692,770	[4] 14,526,786
Tropical fruits	[2] 119,836			7,219,082
Nuts				1,442,675
Forest products				1,722,840
Flowers and plants	672			580,646
Seeds	1,073			121,896
Nursery products	2,914			558,329
Miscellaneous				156,473
Total	7,025,515			95,365,712

[1] Sold as cane.
[2] Estimated from number of trees or vines.
[3] Including value of raisins, wine, etc.
[4] Including value of vinegar, cider, etc.

Of the total value of crops, cereals contributed 35.3 per cent; fruits, 29.7 per cent; hay and forage, 20.4 per cent; vegetables, including potatoes, sweet potatoes, onions, and sugar beets, 7.5 per cent; nuts, forest and nursery products, and flowers and plants, 4.5 per cent; and all other crops, 2.6 per cent.

The average values per acre of the principal crops were as follows: Flowers and plants, $864.06; nursery products, $191.60; small fruits, $143.46; hops, $134.28; hemp, $90.00; miscellaneous vegetables, $84.86; sweet potatoes, $84.39; Irish potatoes, $62.65; tropical fruits, $60.24; orchard fruits, $42.60; grapes, $42.16; sugar beets, $37.59; hay and forage, $8.68; and cereals, $8.41. The crops yielding the highest average returns per acre were grown upon very highly improved land. Their production requires a relatively large amount of labor, and, in addition, large expenditures for fertilizers.

CEREALS.

The following table is an exhibit of the changes in cereal production since 1849.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS: 1849 TO 1899.

PART 1.—ACREAGE.

YEAR.[1]	Barley.	Buckwheat.	Corn.	Oats.	Rye.	Wheat.
1899	1,029,647	395	58,930	153,734	62,925	2,683,405
1889	815,995	664	70,303	57,569	27,413	2,840,807
1879	586,350	1,012	71,781	49,947	20,281	1,832,429

[1] No statistics of acreage were secured prior to 1879.

PART 2.—BUSHELS PRODUCED.

1899	25,149,335	7,835	1,477,093	4,972,356	524,451	36,534,407
1889	17,548,386	10,388	2,381,270	1,463,068	243,871	40,860,337
1879	12,463,561	22,307	1,993,825	1,341,271	181,681	29,017,707
1869	8,783,490	21,928	1,221,222	1,757,507	26,275	16,070,702
1859	4,415,426	76,887	510,708	1,043,006	52,140	5,928,470
1849	9,712		12,236			17,328

In 1899 the total area devoted to cereals was 3,984,036 acres; in 1889 it was 3,812,751 acres; and in 1879, 2,561,800 acres. In the decade from 1889 to 1899, the acreage in oats increased 167.0 per cent; rye, 129.5 per cent; and barley, 26.2 per cent. Buckwheat shows a decrease of 40.5 per cent; corn, 23.3 per cent; and wheat, 5.5 per cent. Although the production of buckwheat, corn, and wheat decreased during the last decade, there was an increase of approximately 5 per cent in the total production of cereals. The largest acreages and quantities, and the largest average yields per acre are found along the San Joaquin and Sacramento rivers. San Joaquin county reports more barley, rye, and wheat than any other county; Sutter county, more buckwheat; and Sonoma county, more corn and oats. Nearly 85 per cent of the 420,452 bushels of Kafir corn reported, was grown in the south central counties of Fresno, Kings, Kern, and Tulare. The acreage given for cereals is exclusive of the acreage of grains cut green for hay and of the acreages of corn, nonsaccharine sorghum, and similar crops grown for forage and ensilage.

HAY AND FORAGE.

In 1900, 49,402 farmers, or 68.1 per cent of the total number, reported hay and forage crops. Excluding cornstalks and corn strippings, the average yield obtained was 1.4 tons per acre. The acreage in hay and forage in 1899 was 56.4 per cent greater than ten years before. In 1899 the acreages and yields of the various kinds of hay and forage crops were as follows: Wild, salt, or prairie grasses, 223,854 acres and 176,466 tons; millet and Hungarian grasses, 1,741 acres and 3,567 tons; alfalfa, or lucern, 298,898 acres and 838,780 tons; clover, 12,407 acres and 22,638 tons; other tame and cultivated grasses, 153,646 acres and 195,627 tons; grains cut green for hay, 1,506,360 acres and 1,714,692 tons; forage crops, 42,695 acres and 83,546 tons; cornstalks and corn strippings, 459 acres and 716 tons.

In Table 18 the production of cornstalks and corn strippings is included under "hay and forage," but the acreage

is included under "corn," as the forage secured was an incidental product of the corn crop.

HOPS.

The cultivation of hops in California is rapidly becoming an important industry, the quantities reported for each census year since 1860 being as follows: 1860, 80 pounds; 1870, 625,064 pounds; 1880, 1,444,077 pounds; and in 1890, 6,547,338 pounds. In 1900, 203 farmers reported an area of 6,891 acres, or an average of 33.9 acres per farm. They obtained and sold from this land in 1899, 10,124,660 pounds of hops, an average of 1,469 pounds per acre, and received therefrom $925,319, or an average of $4,558 per farm, $134 per acre, and $0.09 per pound.

The counties producing hops are mostly inland and extend from the extreme north over two-thirds the length of the state, Sonoma, Mendocino, and Sacramento counties reporting 62.0 per cent of the total acreage.

ORCHARD FRUITS.

The changes in orchard fruits since 1890 are shown in the following table.

TABLE 20.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

FRUITS.	NUMBER OF TREES.		BUSHELS OF FRUIT.	
	1900.	1890.	1899.	1889.
Apples	2,878,169	1,269,784	3,488,208	1,654,636
Apricots	4,241,384	1,442,749	2,547,064	970,941
Cherries	686,891	236,945	321,034	154,063
Peaches	7,472,393	2,669,843	8,563,427	1,691,019
Pears	2,512,890	695,738	1,912,825	577,444
Plums and prunes	9,823,713	1,509,833	5,632,036	1,202,573

Of the farmers of the state, 27,491, or 37.9 per cent, reported orchard fruits in 1899. The value of orchard products was not reported by the census of 1890; but in 1879 it was $2,017,314, and in 1899, $14,526,786, a sixfold gain in twenty years. In making comparisons between the crops of different years, however, it should be remembered that the quantity of fruit produced in any year is determined largely by the nature of the season.

The number of orchard trees increased in the last decade from 7,824,892 to 28,138,471. The most noteworthy changes were in plum and peach trees, which increased about sixfold and threefold, respectively. In 1890, 34.1 per cent of all fruit trees in the state were peach trees, and 19.3 per cent plum and prune trees, while in 1900 the corresponding percentages were 26.6 and 34.9.

Plum and prune trees are found in the greatest numbers in the west central part of the state, more than one-third being in Santa Clara county. These trees increased so rapidly in the last decade that their number in 1900 was greater than the total number of orchard trees in 1890. Tuolumne is the only county in which the number of plum and prune trees has not increased since 1890.

The leading peach-growing counties are Fresno, Placer, Santa Clara, Tulare, Tehama, and Los Angeles; in 1900 they reported more than one-half of all the trees. Most counties reported a much greater number in 1900 than in 1890.

In the last ten years the number of apricot trees has more than doubled. Over one-third of these trees are in Santa Clara, Ventura, and Los Angeles counties.

Apple trees increased in number 126.7 per cent between 1890 and 1900. The coast counties report the largest numbers—Santa Cruz, Sonoma, Monterey, Los Angeles, Mendocino, and San Diego counties having more than one-half of the total number in the state.

The adjoining counties of Solano and Sacramento contain one-fifth of the pear trees in the state. Nearly three times as many were reported in 1900 as in 1890. Cherry trees, also, show a large increase, but are relatively of small importance.

In addition to the trees shown in Table 20, unclassified fruit trees to the number of 520,031 were reported, with a yield of 228,176 bushels of fruit. The value of orchard products for 1900, given in Table 18, includes the value of 2,395 barrels of cider, 6,339 barrels of vinegar, and 117,935,727 pounds of dried and evaporated fruits.

SEMITROPICAL FRUITS.

The following table shows the changes in semitropical fruits since 1890.

TABLE 21.—SEMITROPICAL TREES AND FRUITS: 1890 AND 1900.

FRUITS.	NUMBER OF TREES.		QUANTITIES OF FRUIT.		
	1900.	1890.	Unit of measure.	1899.	1889.
Citrons	4,780	1,757	Boxes	90	----------
Figs	188,941	109,585	Pounds	10,620,366	11,190,816
Guavas	7,056	11,495	Pounds	31,370	----------
Kaki	2,690	19,101	Pounds	59,400	----------
Lemons	1,493,113	82,611	Boxes	874,305	305,598
Limes	311	2,007	Boxes	125	----------
Oranges	5,648,714	1,153,881	Boxes	5,882,193	1,245,047
Pineapples	[1]1,815	[1]145,000	Number	440	----------
Pomeloes	80,918	144	Boxes	17,851	----------
Olives	1,530,164	278,380	Pounds	5,040,227	9,659,208
Miscellaneous	37,957	[2]5,250	Pounds	317,330	----------

[1] Number of plants.
[2] Banana trees.

The total number of semitropical fruit trees increased from 1,809,161 in 1890 to 8,996,459 in 1900. Of the number reported in 1900, 62.8 per cent were orange trees; 17.0 per cent, olive trees; 16.6 per cent, lemon trees; 2.1 per cent, fig trees; and 1.5 per cent, other trees.

The orange groves were reported chiefly by southern counties—San Bernardino, Los Angeles, Riverside, and Orange counties containing more than four-fifths of the trees. In 1900 the number reported was nearly five times as great as it was in 1890. All counties reporting oranges shared in the increase, except Lake and Santa Barbara. The production showed a still greater gain.

Olives are grown chiefly in the extreme southern counties—Los Angeles, San Diego, Ventura, Riverside, and San Bernardino furnishing the greater part of the crop of 1900. The number of olive trees reported in 1900 was nearly six times that reported in 1890. Excluding Los Angeles, the counties named showed a hundredfold increase.

San Diego and Los Angeles counties report over one-

half of the lemon trees of the state, and show marked increases since 1890, the number reported in 1900 being over eighteen times as great as ten years before.

The fig-growing industry centers in Fresno county. Pomeloes, or grape fruit, which in 1890 were reported in but 4 counties, are now grown in over one-half of the counties of the state. Pineapples are found chiefly in San Diego and Riverside counties, and citrons are confined almost exclusively to Los Angeles county. The remaining fruits are of small and decreasing importance.

SMALL FRUITS.

The total area used in the cultivation of small fruits in 1899 was 6,353 acres, distributed among 5,137 farms. The value of the fruits grown was $911,411, an average of $177.42 per farm. Of the total area, 2,418 acres, or 38.1 per cent, were devoted to strawberries; the total production for the state was 7,690,830 quarts, of which more than one-third was reported by Santa Cruz county. Next in importance are blackberries, of which 1,960 acres were reported. Sonoma county reported one-fourth of the total production of 4,159,131 quarts.

The acreage and production of other berries were as follows: Raspberries and Logan berries, 1,039 acres and 1,446,190 quarts; currants, 729 acres and 1,031,100 quarts; gooseberries, 135 acres and 195,670 quarts; and other small fruits, 72 acres and 59,030 quarts.

GRAPES.

Grapes were grown in 1899 by 13,064 farmers, who obtained 7,214,334 centals of fruit from 90,686,458 vines. The total value of the grapes, including the value of raisins and of 5,492,216 gallons of wine made on farms, was $5,622,825. Of the quantity of grapes reported, raisin grapes contributed 3,403,368 centals; wine grapes, 3,191,727 centals; and grapes for table use, 619,239 centals.

Of the 57 counties in California, all but 5 reported grape vines, and nearly one-fourth of the counties had over a million vines each.

Fresno, Sonoma, and Santa Clara are the leading counties in the cultivation of this fruit, reporting, in 1900, more than one-third of the vines of the state. Fresno county alone produced 2,125,388 centals of raisin grapes, 522,529 centals of wine grapes, and 94,418 centals of grapes for table use.

Of the counties reporting large acreages in vines, the greatest number of varieties of wine grapes were grown in Sonoma, Santa Clara, Napa, Sacramento, Los Angeles, and Alameda, while grapes for table use and raisins were reported principally by the adjoining counties of Fresno, Kings, Tulare, and Madera.

VEGETABLES.

The value of all vegetables produced in the state in 1899, including the value of potatoes, sweet potatoes, onions, and sugar beets, was $7,182,318. Of this amount 36.7 per cent represents the value of potatoes, a crop reported by 9,760 farmers, who obtained an average yield of 125 bushels per acre.

Aside from the land devoted to potatoes, sweet potatoes, onions, and sugar beets, 30,194 acres were used in the growing of miscellaneous vegetables. Of this area the products of 9,908 acres were not reported in detail. Of the remaining 20,286 acres, concerning which detailed reports were received, 4,292 acres were devoted to tomatoes; 2,368, to asparagus; 2,123, to sweet corn; 2,024, to watermelons; 1,949, to cabbages; 1,654, to celery; 1,231, to green peas; 1,209, to pumpkins; and 3,436, to other vegetables.

SUGAR BEETS.

Sugar beets were reported in California in 1880, but it was not until within the last decade that their production became an important branch of agriculture in the state. In 1899, 863 farmers devoted to this crop an area of 41,242 acres, an average of 47.8 acres per farm. They obtained and sold from this land 356,535 tons of beets, an average yield of 8.6 tons per acre, and received therefrom $1,550,346, an average of $1,796 per farm, $38 per acre, and $4.35 per ton.

These beets were grown in 17 counties in the central and southern coast regions; the counties of Ventura, Monterey, Santa Clara, and Alameda, ranking in the order named, reported 70.6 per cent of the total acreage.

FLORICULTURE.

Flowers and plants were grown for market in 1899 by 280 farmers, of whom 208 derived their principal income from the sale of floral products. These commercial florists had invested a capital of $1,280,281, of which $766,310 represents the value of land; $467,025, that of buildings and other improvements; $36,881, that of implements; and $9,465, that of live stock. They expended $110,705 for labor and $7,379 for fertilizers. The value of the flowers and plants grown by the commercial florists was $511,125, and that of those grown by others, $69,521.

LAND UNDER GLASS.

Owing to the natural advantages of the climate of California, the amount of glass used is not so large, in proportion to the value of the products raised, as in most other states. In 1900, 429 farms reported land under glass, with an aggregate area of 1,572,480 square feet. Of the 208 florists in the state only 150 use glass, and they have 1,636,721 square feet of glass surface, equivalent to 1,227,541 square feet of land under glass.

NURSERIES.

Trees and shrubs valued at $558,329 were grown in 1899, by 245 farmers, of whom 141 derived their principal income from the sale of nursery stock. The farms of these commercial nurserymen were worth $1,725,945, of which $1,515,630 represents the value of land; $10,315, that of buildings; and $55,243, that of implements, machinery, and live stock. The expenditure for labor was $158,845, and for fertilizers, $8,607.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899, including the value of board furnished, was $25,845,120, an

average of $356 per farm. The average was highest on the most intensively cultivated farms, being $1,123 for nurseries, $1,053 for sugar farms, $532 for florists' establishments, $434 for hay and grain farms, $428 for fruit farms, $353 for vegetable farms, $259 for dairy farms, and $255 for live-stock farms. "Managers" expended, on an average, $1,732; "share tenants," $418; "cash tenants," $361; and "owners," $214. White farmers expended $354 per farm, and colored farmers, $463.

Fertilizers purchased in 1899 cost $937,050, or an average of $13 per farm; in 1889 the total value of fertilizers purchased was only $148,886. The average expenditure in 1899 was greatest for nurseries, amounting to $61; for fruit farms it was $38; for florists' establishments, $35; for sugar farms, $8; for hay and grain farms, $7; for vegetable farms, $6; for dairy farms, $3; and for live-stock farms, $2.

INDIAN RESERVATIONS.

At the present time most of the Indians in California are located on 26 reservations, namely: Hupa Valley, Round Valley, Tule River, Yuma, and 22 Mission reservations. They comprise a large number of tribes and represent at least fourteen different linguistic stocks. At least one-half of them can use enough English to carry on ordinary conversation, and the greater number wear citizens' clothing. They are, as a rule, self-supporting, rations being issued only to the old and infirm.

HUPA VALLEY RESERVATION.

The Hupa Valley reservation, in Humboldt county, comprises an area of 155 square miles. The reservation proper consists principally of timber or grazing land with a cultivable area of about 1,200 acres.

The total number of Indians on the reservation June 1, 1900, was 1,112. Of this number many were in possession of well stocked farms, the average tillable area being 30 acres. Several of the Indian farmers own improved implements and machinery, and raise profitable crops of corn, oats, wheat, and hay. They have orchards of peach, pear, apple, and cherry trees.

Very little attention is given to dairying, but the sales of domestic animals and animal products in 1899 amounted to $4,800.

ROUND VALLEY RESERVATION.

Round Valley reservation, in Mendocino county, embraces an area of 59 square miles. The fertile soil of the valley and the fine grazing land of the surrounding foothills, offer excellent opportunities for agricultural operations. The reservation had a population, June 1, 1900, of 599, and the average allotment of agricultural land at that time was 40 acres per family.

The farms, as a rule, are well stocked and provided with modern machinery. The principal crops are wheat, oats, and barley, in the order named, although a large acreage of wild hay is cut each year. Small orchards, comprising a large variety of fruit trees, are reported, and also considerable quantities of vegetables. In 1899 nearly all farmers owned cattle, many having large herds. At the time of the enumeration one farmer had 150 cows not kept for milk, valued at $3,000, and his sales of live stock and other animal products in 1899 amounted to $1,700. Swine and poultry are kept on most farms.

TULE RIVER RESERVATION.

This reservation is located in Tulare county and comprises 76 square miles, the greater portion of which is timber and grazing land. Less than 250 acres, made up of scattered patches of 5 or 10 acres each, is suitable for cultivation.

Most of the 143 Indians on the reservation derive their living from stock raising, or through employment as sheep shearers at certain seasons of the year.

In 1899, 36 acres were devoted to corn, wheat, and barley, and 44 acres to alfalfa and grains cut green for hay. A small acreage was used in the cultivation of melons, squashes, sweet corn, and dry beans. Nearly all crops are irrigated.

Some farms are well stocked with range cattle and small herds of Indian ponies, and in 1899, 18 farmers reported sales of live stock and animal products.

YUMA RESERVATION.

The Yuma reservation of 71¼ square miles is located in San Diego county, and had a population, June 1, 1900, of 817. In manners and customs these Indians are the most primitive of the California tribes. Their food consists principally of fish and the mesquite bean, which grows in abundance on the reservation.

They cultivate only a small acreage of land, and even in favorable seasons seldom raise more than one hundred bushels each of corn, wheat, and barley. In the census year their crop was a total failure. The Yumas own no cattle, their live stock being limited to a few horses, mules, and burros, and several hundred chickens.

THE MISSION RESERVATIONS.

Most of the Mission Indians are located on small reservations scattered over Riverside and San Diego counties. Few of these reservations have any appreciable amount of arable land, and some are practically desert. The extreme drought of the two years immediately preceding the census year worked great hardship among them, and their crops in 1899 were nearly complete failures. Morongo reservation, the largest and most prosperous of all, is provided with cement irrigation ditches constructed by the Government, and was the only reservation which reported any crops in 1899. Small quantities of corn, wheat, and alfalfa were secured. Orchard products were reported by most farmers on this reservation.

IRRIGATION STATISTICS.

California, with its varied topography, soil, and climate, offers an interesting field for the study of irrigation. No other state produces such a variety of crops, and in no other state have agricultural lands, as such, reached the selling price of the semitropical fruit orchards of southern California. Except in a few localities there is not, in California, the absolute necessity for irrigation that exists in most other western states and territories. On nearly all of the lands that are irrigated some crops will grow, in ordinary seasons, without artificial application of water. The more valuable crops, however, usually require irrigation, and with it the yield of all crops is increased greatly. An irrigation system is an insurance against crop failure in years of drought.

Table A is a comparative exhibit, by counties, of the number of irrigators and the acreages irrigated in 1889 and in 1899.

TABLE A.—NUMBER OF IRRIGATORS, AND ACRES IRRIGATED, WITH PERCENTAGES OF INCREASE, BY COUNTIES: 1889 AND 1899.

COUNTIES.	NUMBER OF IRRIGATORS.			ACRES IRRIGATED.		
	1899.	1889.	Per cent of increase.	1899.	1889.	Per cent of increase.
The State	25,675	13,732	87.0	1,446,114	1,004,233	44.0
Alameda	101			2,532		
Alpine	33	31	6.5	4,391	2,680	63.8
Amador	137	221	[1] 38.0	1,167	3,136	[1] 62.8
Butte	455	372	22.3	7,332	5,478	33.8
Calaveras	143	57	150.9	1,476	582	153.6
Colusa[2]	62	93	38.7	2,995	7,525	[1] 41.8
Glenn[2]	67			1,382		
Eldorado	295	425	[1] 30.6	3,387	4,318	[1] 21.6
Fresno[3]	2,459	1,400	84.2	283,737	105,605	190.6
Madera[3]	120			23,152		
Inyo	362	209	73.2	41,026	46,242	[1] 11.3
Kern	653	370	76.5	112,533	154,549	[1] 27.2
Kings[4]	780			92,794		
Tulare[4]	1,467	1,287	74.6	86,864	168,455	6.6
Lake	45	68	[1] 33.8	523	958	[1] 45.4
Lassen	318	293	6.8	49,684	55,819	[1] 11.1
Los Angeles	4,066	1,843	120.6	85,644	70,164	22.1
Mariposa	66	90	[1] 26.7	574	730	[1] 21.4
Merced	520	231	125.1	111,330	32,309	244.6
Modoc	467	402	16.2	78,016	80,110	[1] 2.6
Mono	97	94	3.2	59,202	43,523	36.0
Monterey	88	21	319.0	6,675	891	649.2
Nevada	283	318	[1] 11.3	4,003	3,990	0.3
Orange	1,658	1,039	50.0	41,549	31,816	30.6
Placer	518	431	20.2	10,308	7,480	37.8
Plumas	187	186	0.5	28,423	34,196	[1] 16.9
Riverside[5]	1,737			32,947		
San Bernardino[5]	1,854	1,521	126.5	87,877	57,907	80.6
San Diego[5]	1,041	524		16,022	10,193	
Sacramento	425	146	191.1	12,409	1,718	622.3
San Benito	166	77	115.6	2,870	905	217.1
San Joaquin	414	84	392.9	18,466	2,254	719.3
San Luis Obispo	78			1,137		
Santa Barbara	182	47	287.2	3,218	396	712.6
Santa Clara	1,129	184	513.5	40,097	6,686	499.7
Shasta	686	475	44.4	16,159	13,662	18.3
Sierra	98	86	14.0	13,603	14,499	[1] 6.2
Siskiyou	594	302	96.7	49,108	31,567	55.6
Solano	29			2,805		
Stanislaus	221	42	426.2	17,505	3,370	419.4
Tehama	209	116	80.2	11,512	7,189	60.6
Trinity	170	140	21.4	4,710	3,186	47.8
Tuolumne	185	100	85.0	1,381	1,285	7.5
Ventura	353	134	163.4	11,935	3,347	256.6
Yolo	167	39	328.2	5,161	1,602	222.2
Yuba	181	122	48.4	2,477	2,852	[1] 18.1
All other counties	350	112	212.5	3,884	1,019	276.3
Indian reservations	64			242		

[1] Decrease.
[2] Glenn organized from part of Colusa in 1892.
[3] Madera organized from part of Fresno in 1893.
[4] Kings organized from part of Tulare in 1893.
[5] Riverside organized from parts of San Bernardino and San Diego in 1893.

The sketch map represents, by areas, in solid black, the principal regions in which irrigation has been successfully applied to any considerable extent.

In the ten years ending with 1899 the number of irrigators in the state increased from 13,732 to 25,675, or 87.0 per cent; and the area irrigated, from 1,004,233 acres to 1,446,114 acres, or 44.0 per cent. Of the total improved acreage in 1900, 12.1 per cent was reported as irrigated, but the area actually irrigated was much greater than reported. In many localities, large areas which are of little value without water, and upon which water has not been directly applied, have been made fertile by the seepage from neighboring irrigated land. In most cases the enumerators did not report such land as irrigated, but correspondence established the fact that extensive areas were benefited in this way.

The census year 1899 was the third consecutive year of extremely light rainfall. New ditches were built to supply lands that do not usually require irrigation, while other ditches were wholly or partially abandoned because of failure of the water supply.

As the artificial application of water requires more than the ordinary amount of labor and capital, there is, in most irrigation districts, a marked tendency toward intensive farming. In 1889 the average size of the irrigated farms of California was 73 acres, while in 1899 it was but 57 acres.

Table B is an exhibit, by counties, of the number of irrigated farms compared with the total number of farms, and of the irrigated acreage compared with the total improved acreage.

TABLE B.—NUMBER OF IRRIGATED FARMS COMPARED WITH TOTAL NUMBER OF FARMS, AND IRRIGATED ACREAGE COMPARED WITH TOTAL IMPROVED ACREAGE, JUNE 1, 1900.

COUNTIES.	NUMBER OF FARMS.			IMPROVED ACREAGE.		
	Total.	Irrigated.	Per cent irrigated.	Total.	Irrigated.	Per cent irrigated.
The State	72,542	25,675	35.4	11,958,837	1,446,114	12.1
Alameda	2,787	101	3.6	220,118	2,532	1.1
Alpine	37	33	89.2	4,391	4,391	100.0
Amador	560	137	24.5	48,936	1,167	2.4
Butte	1,179	455	38.6	302,029	7,332	2.4
Calaveras	575	143	24.9	41,402	1,476	3.6
Colusa	582	62	10.7	358,227	2,995	0.8
Eldorado	750	295	38.9	45,131	3,387	7.4
Fresno	3,290	2,459	74.7	786,337	283,737	36.1
Glenn	529	67	12.7	355,781	1,382	0.4
Inyo	424	362	85.4	48,740	41,026	93.8
Kern	1,098	653	59.5	324,031	112,533	34.7
Kings	932	780	83.7	262,148	92,794	35.4
Lake	723	45	6.2	41,414	523	1.3
Lassen	555	318	56.4	133,206	49,684	37.2
Los Angeles	6,577	4,066	61.8	518,744	85,644	16.5
Madera	523	120	22.9	277,721	23,152	8.3
Mariposa	381	66	17.3	14,003	574	4.1
Merced	999	520	52.1	613,876	111,330	18.2
Modoc	638	467	73.2	122,647	78,016	63.6
Mono	112	97	86.6	65,238	59,202	90.7
Monterey	1,850	88	4.7	373,005	6,675	1.8
Nevada	522	283	54.2	24,898	4,003	16.1
Orange	2,388	1,658	65.2	239,847	41,549	17.5
Placer	1,073	518	48.1	121,003	10,308	8.5
Plumas	267	187	70.0	57,851	28,423	49.6
Riverside	2,340	1,737	74.2	216,033	32,947	15.3
Sacramento	1,392	425	30.5	327,159	12,409	3.8
San Benito	907	166	18.3	168,698	2,870	1.7
San Bernardino	2,350	1,854	78.9	96,920	87,877	90.7
San Diego	2,698	1,041	38.6	229,791	16,022	7.0

TABLE B.—NUMBER OF IRRIGATED FARMS COMPARED WITH TOTAL NUMBER OF FARMS, AND IRRIGATED ACREAGE COMPARED WITH TOTAL IMPROVED ACREAGE, JUNE 1, 1900—Continued.

COUNTIES.	NUMBER OF FARMS.			IMPROVED ACREAGE.		
	Total.	Irrigated.	Per cent irrigated.	Total.	Irrigated.	Per cent irrigated.
San Joaquin	1,966	414	21.1	652,928	18,466	2.8
San Luis Obispo	1,813	78	4.3	412,356	1,137	0.3
Santa Barbara	1,149	182	15.8	202,982	3,218	1.6
Santa Clara	3,995	1,129	28.3	290,285	40,097	13.8
Shasta	1,221	686	56.2	86,540	16,159	18.7
Sierra	141	98	69.5	26,687	13,603	51.0
Siskiyou	931	594	63.8	181,029	49,108	27.1
Solano	1,151	29	2.5	344,058	2,805	0.8
Stanislaus	951	221	23.2	622,700	17,505	2.8
Tehama	1,055	209	19.8	269,693	11,712	4.3
Trinity	272	170	62.5	14,144	4,710	33.3
Tulare	2,212	1,467	66.3	546,289	86,854	15.9
Tuolumne	457	185	40.5	36,461	1,381	3.8
Ventura	1,269	353	27.8	174,419	11,935	6.8
Yolo	1,214	167	13.7	351,213	5,161	1.5
Yuba	483	181	37.5	154,013	2,477	1.6
All other counties	12,925	350	2.7	1,150,406	3,834	0.3
Indian reservations	287	64	22.3	5,244	242	4.6

In 1889, 26.0 per cent of the farms of California were irrigated, and in 1899, 35.4 per cent. Of the improved acreage, 8.2 per cent was irrigated in 1889, and 12.1 per cent in 1899.

It is difficult to fix upon any basis for a comparison of land values which will show the actual value added to the land through irrigation alone. Most of the lands have some agricultural value without irrigation. After water is supplied the value depends chiefly upon the use to which the land is put, and, in the case of orchards, upon the age and condition of the trees. While irrigation is not the only agency giving value to the higher-priced farming lands, it is a vital factor in most cases. In every section of the state are tracts of naturally moist land, as productive as the neighboring irrigated lands, and of the same average value. The area of such tracts, however, is small.

Table C gives the acreage and production of all crops, and of the crops grown on irrigated land in 1899.

TABLE C.—ACREAGE AND PRODUCTION OF PRINCIPAL IRRIGATED CROPS IN 1899.

CROPS.	ACREAGE.			PRODUCTION.			
	Total.	Irrigated.	Per cent irrigated.	Unit of measure.	Total.	Irrigated.	Per cent irrigated.
Alfalfa	298,898	228,970	76.6	Tons	838,780	664,274	79.2
Grains cut green for hay	1,506,360	89,158	5.9	Tons	1,714,692	117,257	6.8
Other hay and forage crops	434,802	169,294	38.9	Tons	482,560	216,207	44.8
Grapes	133,362	37,210	27.9	Pounds	721,433,373	329,934,723	45.7
Orchard fruits	[1]340,978	[1]138,778	40.7	Bushels	28,756,589	11,048,703	46.5
Subtropical fruits	[1]119,836	[1]85,922	71.7				
Small fruits	6,353	3,161	49.8				
Barley	1,029,647	83,725	8.1	Bushels	25,149,335	1,582,612	6.1
Corn	53,930	15,215	28.2	Bushels	1,477,093	490,802	33.2
Oats	153,734	5,318	3.5	Bushels	4,972,356	172,125	3.5
Rye	[illegible]925	956	1.5	Bushels	524,451	10,890	2.1
Wheat	2,683,[illegible]05	161,086	6.0	Bushels	36,534,407	1,649,455	4.5
Potatoes	42,098	20,435	48.5	Bushels	5,242,596	3,119,690	59.5
Sweet potatoes	1,607	1,241	77.2	Bushels	239,029	198,877	83.2
Onions	2,207	1,369	62.0	Bushels	514,859	371,542	72.2

[1] Estimated from number of trees or vines.

California has two great mountain systems, the Sierra Nevada, extending along the eastern border, and the Coast Range, following the coast line. These systems are joined in the northern part of the state in the vicinity of Mt. Shasta, and in the southern part near Mt. Tehachapi. Between the two ranges lie the valleys of the Sacramento and San Joaquin rivers, containing most of the agricultural lands of the state. North of the Sacramento Valley is a rugged region drained by the Klamath River. In the extreme eastern portion of the state are a few rivers which flow east into lakes situated near the California-Nevada boundary line, while along the entire coast are streams flowing from the Coast Range into the ocean. In the southern portion of the state, also, there are several small rivers of great agricultural importance.

For convenience the following divisions—arbitrary in a measure, but conforming as far as practicable to the natural drainage basin divisions—have been adopted: Counties bordering on San Francisco Bay—Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma; counties of the north coast—Del Norte, Humboldt, and Mendocino; counties drained by Klamath River—Siskiyou and Trinity; counties drained by Sacramento River—Amador, Butte, Colusa, Eldorado, Glenn, Lake, Lassen, Modoc, Nevada, Placer, Plumas, Sacramento, Shasta, Sierra, Sutter, Tehama, Yolo, and Yuba; counties drained by San Joaquin River—Calaveras, Fresno, Kern, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tulare, and Tuolumne; drained by Carson River—Alpine county; drained by Owens Lake—Inyo county; drained by Mono Lake and Walker River—Mono county; drained by San Benito River—San Benito county; coast counties from San Francisco Bay south, to and including Los Angeles county—Los Angeles, Monterey, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura; counties drained by Santa Ana River—Orange, Riverside, San Bernardino, and San Diego. A portion of the area of the counties included in the Sacramento River division is really in other and smaller drainage basins, the most important of which is the Honey Lake basin.

In certain localities the necessity and value of water for particular crops, and especially for fruit, has led to extraordinary and successful efforts to obtain it from under-

ground sources. This is particularly true of Los Angeles, Orange, Riverside, Santa Clara, San Bernardino, and Tulare counties, although in nearly every county some irrigation from wells is reported.

Table D shows, by the above divisions, the number of farms, and the acreage, watered from two sources, namely: From open streams, lakes, and springs, and from wells and tunnels. In some instances land supplied with water from streams during the winter months is irrigated from wells in the summer. Land thus watered has been regarded as irrigated from streams, and the acreage is not included in the figures showing well irrigation.

TABLE D.—NUMBER OF FARMS AND ACRES IRRIGATED FROM STREAMS AND FROM WELLS IN 1899.

DIVISIONS.	NUMBER OF FARMS IRRIGATED.			NUMBER OF ACRES IRRIGATED.		
	Total.	From streams.	From wells.	Total.	From streams.	From wells.
The State	25,675	18,781	6,894	1,446,114	1,293,608	152,506
Counties bordering on San Francisco Bay	1,437	335	1,102	47,619	20,152	27,467
North coast counties	91	70	21	356	286	70
Counties drained by Klamath River[1]	765	756	9	53,823	53,768	55
Counties drained by Sacramento River[2]	4,611	4,153	458	248,874	241,128	7,746
Counties drained by San Joaquin River[3]	7,049	6,554	495	749,917	732,326	17,591
Alpine county, drained by Carson River	33	33	----	4,391	4,391	----
Inyo county, drained by Owens Lake	362	362	----	41,026	41,021	[4]5
Mono county, drained by Mono Lake and Walker River	97	97	----	59,202	59,202	----
San Benito county, drained by San Benito River	166	84	82	2,870	1,868	1,002
Coast counties from San Francisco Bay south to and including Los Angeles county	4,832	2,044	2,788	109,424	54,863	54,561
Counties drained by Santa Ana River[5]	5,191	3,708	1,483	112,590	72,798	39,792
San Diego county	1,041	585	456	16,022	11,805	4,217

[1] Includes Hupa Valley Indian reservation.
[2] Includes irrigated area of Honey Lake basin.
[3] Includes Tule River Indian reservation.
[4] Same acreage irrigated also from streams.
[5] Includes Mission Indian reservation.

Water is obtained from open streams, lakes, and springs by two methods, gravity and pumping. By the gravity system, water is directed into the ditches usually by temporary or permanent dams thrown across the streams, but in some cases the bottom of the ditch is made lower at its head than the bed of the stream, thus obviating the necessity of dam building. Sometimes the stream is dammed and the water allowed to flood the contiguous lands, no ditches being used. This method is employed chiefly along the Pitt River. In the lower portions of the Sacramento and San Joaquin valleys, several thousand acres of land are moistened by water let in through headgates built in the levees which protect the reclaimed marsh lands from the river. The construction and maintenance of these intake gates and the distributing ditches involve much labor and expense, and the acreage so watered has, therefore, been included with the irrigated area.

Table E presents, by divisions, the principal statistics relating to the canals and ditches receiving water from streams by gravity, and used solely or chiefly for irrigation purposes in 1899.

TABLE E.—NUMBER, LENGTH, AND COST OF CONSTRUCTION OF MAIN CANALS AND DITCHES RECEIVING WATER FROM STREAMS BY GRAVITY, AND USED SOLELY OR CHIEFLY FOR IRRIGATION PURPOSES.

DIVISIONS.[1]	Acreage irrigated in 1899.	MAIN CANALS AND DITCHES.			
		Number.	Length in miles.	Cost of construction.	
				Total.	Per acre irrigated in 1899.
The State[1]	1,248,178	1,913	5,106	$12,855,012	$10.30
Counties bordering on San Francisco Bay	15,978	128	87	112,100	7.02
North coast counties	186	51	18	2,475	13.31
Counties drained by Klamath River	53,763	446	651	257,124	4.78
Counties drained by Sacramento River[2]	185,358	818	1,819	1,594,900	8.60
Counties drained by San Joaquin River	724,329	201	1,422	6,293,636	8.69
Counties drained by Carson and Walker rivers, Mono Lake, and Owens Lake	104,614	145	531	610,398	5.83
San Benito county drained by San Benito River	1,868	6	17	36,000	19.27
Coast counties from San Francisco Bay south to and including Los Angeles county	48,626	57	210	1,076,492	22.14
Counties drained by Santa Ana River	111,366	43	324	2,782,910	24.99
San Diego county	2,090	15	27	88,977	42.57

[1] Indian reservations not included.
[2] Includes irrigated area of Honey Lake basin.

In 1899 there were operated in California 1,913 ditches receiving water from open streams, lakes, and springs by gravity, and used chiefly or solely for irrigation purposes. The total cost of constructing these ditches was $12,855,012, and the area irrigated in the census year was 1,248,178 acres, making the average cost of construction per acre irrigated in 1899, $10.30. The total length of the main ditches was 5,106 miles.

Many ditches, especially in the southern part of the state, are supplied with water from other canals, although operated as separate systems. The business relations between the operators of the major system and the subsystems are often complicated, and the limitations of an investigation conducted chiefly by correspondence have made it necessary to consider as laterals all ditches not receiving water directly from streams. Consequently, the mileage and the cost of construction of many ditches which are operated, in a measure, under independent management, are not included in Table E.

Santa Clara is the only county of the first division in which irrigation is practiced to any considerable extent. The water taken from streams, which is supplied principally by Penitencia Creek, is used chiefly for orchards, and is applied during the winter season, two or three applications generally being sufficient. In the other counties of this division irrigation is used chiefly for truck farms, although in Alameda county several hundred acres of alfalfa were irrigated from Alameda Creek and other small streams.

The coast counties north of San Francisco Bay have a heavy winter rainfall, and a summer precipitation from dews and fogs. There is some irrigation for truck gardens, and on the higher lands of Mendocino county a number of

farmers apply water to their alfalfa fields. There are no large canals, each irrigator usually operating a small ditch of his own.

In 1899, 53,763 acres in Siskiyou and Trinity counties were irrigated from streams, principally the tributaries of the Klamath River. Irrigation is practiced chiefly for hay and forage crops. The ditches used are generally of simple construction and comparatively inexpensive.

From the Sacramento River and its many tributaries, and from the streams flowing into Honey Lake, 241,128 acres were irrigated in 1899. Gravity ditches used solely or chiefly for irrigation supplied 185,358 acres, while a large area was watered from canals used principally for mining purposes. In the northern counties of this division, the method of damming streams, causing them to flood the contiguous land, is often employed. Irrigation is sometimes used on the reclaimed marsh lands bordering the Sacramento River near its mouth.

The southern portion of the great interior basin of California is composed of the San Joaquin, Tulare, and Kern valleys. There are no distinct lines of demarcation between these valleys, and they are usually included in the general term "San Joaquin Valley," the San Joaquin River being the only drainage outlet to the sea. In this division 749,917 acres were irrigated in 1899, of which area 732,326 acres were supplied with water from streams, and a comparatively small acreage from ditches used principally for mining or power purposes. The owners of a number of farms which were formerly marsh lands, but are now protected from the river by levees, have successfully practiced irrigation by filling ditches with river water siphoned over the levees or let in through flood gates. In 1899 the number of ditches operated by gravity was 201, from which 724,329 acres were watered.

In Alpine, Mono, and Inyo counties, agriculture without irrigation is practically impossible, and in these counties in 1899, 104,614 acres were irrigated. The water was supplied by streams, and was conducted by ditches built for irrigation purposes.

There were six irrigation ditches in San Benito county in 1899, from which 1,868 acres were supplied with water. Alfalfa was the principal crop irrigated.

In the coast counties from San Francisco Bay south to and including Los Angeles county, the number of irrigation ditches obtaining water from streams by gravity in 1899 was 57. From these ditches 48,626 acres, principally in Los Angeles and Ventura counties, were irrigated. Water is used chiefly for orchards and for hay and forage crops.

In the three counties drained by the Santa Ana River there were, in 1899, 111,366 acres irrigated from streams by gravity ditches. In these counties, and in Los Angeles county, the water supply of several gravity systems is supplemented by water pumped from streams and wells, and in some instances by water from artesian wells. In such cases the cost of the pumping plants and sinking wells has been deducted from the construction cost of the systems, as shown in Table E. In the greater portion of California, most of the water in the rivers runs waste, but in the counties south of the San Joaquin Valley the flow of the streams is completely utilized.

In San Diego county the principal systems from which water is obtained, although constructed as gravity ditches, are not included in the figures of Table E, as, on account of the light rainfall in 1899, the San Diego Land and Water Company and the San Diego Flume Company were compelled to pump water from wells. The majority of ditches reported had water for a short period only, and the acreage irrigated from each was much less than in an average year.

In 1899, 11,780 acres in the state were irrigated with water pumped from open streams and lakes. The plants used were similar to those employed in pumping from wells. On the lower Sacramento River a barge fitted with two 15-inch rotary pumps driven by an engine of 150 horsepower, was successfully operated in irrigating the lands of its owners. The barge had a propelling wheel, and was rigged with pipes, derricks, etc., for lifting the water above the banks. This was the only floating plant reported.

Wells have an important place in the agricultural economy of California. Exclusive of the area watered from ditches whose stream supply was supplemented by water derived from underground sources, there were, in 1899, 152,566 acres irrigated from wells and tunnels. Water from streams is considered better for the soil than that from wells, as it fertilizes as well as moistens the land, while well water is sterile and often contains alkalies to a harmful degree. But, notwithstanding these admitted disadvantages, some prefer well irrigation, as the supply is certain and can be applied at the times and in the quantities desired.

Water is obtained from underground sources in three ways: By pumping from wells, by driving tunnels in the sides of hills and mountains, and by using flowing wells. Windmills are not generally employed, even the smaller plants being operated by steam, gasoline, or electricity. Many of the systems are large and expensive, and plants costing $10,000 or more, used for single farms, are not uncommon. Repairing is an important matter in the operation of pumping plants, not only on account of the expense, but because a breakdown might occur when the water is most needed. For this reason, and because they are more efficient, centrifugal and pneumatic pumps are preferred to plunger pumps. The principal elements governing the cost of operating a pumping plant are the kind and condition of the machinery, fuel, labor, the height to which the water must be lifted and the distance it must be carried, and repairing. As a rule, the larger the plant the less the cost of water per inch, and for this reason the farmers in many localities have built cooperative plants.

The fuel generally used is oil, either crude or distillate. With the development of California's oil fields this fuel became cheaper, making it profitable to pump water for crops. The oil industry and irrigation are mutually helpful. In 1899 the highest price reported for crude oil was

paid in Tulare county—7 cents per gallon for a drum of 110 gallons. The lowest price was reported from Santa Clara county—85 cents for a barrel of 42 gallons, or a little more than 2 cents per gallon. The price of distillate varied from 9 cents in Los Angeles county to 13 cents in Yolo county; and that of gasoline, from 15 cents in Santa Clara county to 20 cents in Colusa county. Most of the pumping plants in Santa Clara county use wood for fuel. Wood costs from $2.50 to $8.00 per cord. One irrigator reported that he had substituted an oil engine, using $2.10 worth of crude oil per day for a wood-burning plant which, while consuming $8.00 worth of fuel per day, pumped only the same quantity of water. Coal is used to some extent, and a few plants burn the branches trimmed from orchards. Most of the plants in Tulare county are operated by electricity furnished by power companies.

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 165. WASHINGTON, D. C. April 29, 1902.

AGRICULTURE.

FLORIDA.

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

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics of agriculture in the state of Florida, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that—

> The schedules relating to agriculture shall comprehend the following topics: Name of occupant of each farm, color of occupant, tenure, acreage, value of farm and improvements, acreage of different products, quantity and value of products, and number and value of live stock. All questions as to quantity and value of crops shall relate to the year ending December thirty-first next preceding the enumeration.

A "farm," as defined by the Twelfth Census, includes all the land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It also includes the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The farms of Florida, June 1, 1900, numbered 40,814, and had a value of $40,799,838. Of this amount $9,976,822, or 24.5 per cent, represents the value of buildings, and $30,823,016, or 75.5 per cent, the value of land and improvements other than buildings. On the same date the value of farm implements and machinery was $1,963,210, and that of live stock was $11,166,016. These values, added to that of farms, give $53,929,064, the "total value of farm property."

The products derived from domestic animals, poultry, and bees, including animals sold or slaughtered on farms, are referred to in this bulletin as "animal products." The total value of all such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was $18,309,104, of which amount $4,810,524, or 26.3 per cent, represents the value of animal products, and $13,498,580, or 73.7 per cent, the value of crops, including forest products cut or produced on farms. The total value of farm products for 1899 exceeds that reported for 1889 by $6,222,774, or 51.5 per cent. A large part of this apparent increase doubtless is due to a more detailed enumeration in 1900 than in 1890.

The "gross farm income" is obtained by deducting from the "total value of farm products" the value of the products fed to live stock on the farms of the producers. In 1899 the reported value of products fed was $2,118,630, leaving $16,190,474 as the gross farm income for that year. The percentage which this amount is of the "total value of farm property" is referred to in the text of the bulletin as the "percentage of gross income upon investment." For Florida in 1899 it was 30.0 per cent. As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained by any census, no statement of net farm income can be given.

The statistics presented in this bulletin will be treated in greater detail in the final report on agriculture in the United States, which will be published about June 1, 1902. The present publication is designed to present a summarized advance statement for Florida.

Very respectfully,

L. G. Powers.

Chief Statistician for Agriculture.

CP 15M

AGRICULTURE IN FLORIDA.

GENERAL STATISTICS.

Florida has a total land surface of 54,240 square miles, or 34,713,600 acres, of which 4,363,891 acres, or 12.6 per cent, are included in farms.

The surface of the state is level, nowhere reaching an altitude of 500 feet except at a few places along the central ridge of the peninsula. The lands of the state may, in general, be classified as hammock, high-pine, flatwood, and swamp. The hammock land is the most fertile, but is found only in small detached areas. The high-pine land is favored for horticulture, but requires heavy fertilization to insure good crops, while the flatwoods, as a rule, are suitable only for grazing purposes. The swamp land, though generally covered with valuable timber, has a very fertile, alluvial soil, and, when diked, is especially adapted to the production of rice and sugar.

In the last decade destructive frosts were a severe check to the development of agriculture in Florida, and account for the decrease since 1890 in total farm wealth shown in the tables.

NUMBER AND SIZE OF FARMS.

The following table gives, by decades since 1850, the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1850 TO 1900.

YEAR.	Number of farms.	NUMBER OF ACRES IN FARMS.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.	Average.	
1900	40,814	4,363,891	1,511,653	2,852,238	106.9	34.6
1890	34,228	3,674,486	1,145,693	2,528,793	107.4	31.2
1880	28,438	3,297,324	947,640	2,349,684	140.7	28.7
1870	10,241	2,373,541	736,172	1,637,369	231.8	31.0
1860	6,568	2,920,228	654,213	2,266,015	444.6	22.4
1850	4,304	1,595,289	349,049	1,246,240	370.7	21.9

The number of farms in Florida has increased in every decade for the last fifty years, and so rapidly that in 1900 there were over nine times as many farms as there were in 1850 and 19.2 per cent more than there were in 1890. Except in the decade 1860 to 1870, the total acreage of farm land has also increased, but, on the whole, less rapidly than the number of farms, so that the average size of farms has decreased, being in 1900 less than one-fourth as great as in 1860. The area of improved farm land has increased in every decade since 1850, even in the decade 1860 to 1870 when the total farm acreage showed a decrease. This increase has been far more rapid in certain decades than in others, but in all decades except from 1870 to 1880, it has outstripped the increase in unimproved land. Consequently the percentage of farm land improved has shown a considerable increase since 1850, constituting about one-third of the total farm acreage in 1900, as compared with about one-fifth in 1850.

FARM PROPERTY AND PRODUCTS.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year, beginning with 1850.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND OF FARM PRODUCTS: 1850 TO 1900.

YEAR.	Total value of farm property.	Land, improvements, and buildings.	Implements and machinery.	Live stock.	Farm products.[1]
1900	$53,929,064	$40,799,838	$1,963,210	$11,166,016	$18,309,104
1890	81,046,200	72,745,180	1,158,040	7,142,980	12,086,830
1880	26,340,481	20,291,835	689,666	5,358,980	7,489,392
1870[2]	15,665,151	9,947,920	505,074	5,212,157	[3] 8,909,746
1860	22,889,752	16,485,727	900,669	5,553,356	
1850	9,851,962	6,328,109	658,795	2,880,058	

[1] For year preceding that designated.
[2] Values for 1870 were reported in depreciated currency. To reduce to specie basis of other figures, they must be diminished one-fifth.
[3] Includes betterments and additions to live stock.

The most significant features of the change in agricultural conditions reflected in the above table are the rapid development in the decade from 1850 to 1860; the disastrous effects of the Civil War, from which the state did not recover entirely until the decade 1880 to 1890; the remarkable progress shown for the decade 1880 to 1890; and the marked decrease in the value of land, improvements, and buildings in the last decade.

This decrease in the total value of farm property in the last decade is due entirely to a depreciation in the value of land, improvements, and buildings, resulting from the effects of the destructive frosts of 1894–95 upon the fruit-growing industry of the state. All other classes of farm property show a considerable increase in value. In the case of live stock the increase, 56.3 per cent, is simply another result of the causes just mentioned. Abandoned fruit lands were utilized for grazing purposes, with a consequent development of cattle raising, that contributed towards offsetting the losses in fruit production. A part of the increase of 69.5 per cent in the value of implements and machinery, and of 51.5 per cent in the value of products, is doubtless due to a more detailed enumeration in 1900 than in previous census years.

COUNTY STATISTICS.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUES OF FARM PROPERTY.				Value of products not fed to live stock.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
The State	40,814	39,265	4,363,891	1,511,653	$30,823,016	$9,976,822	$1,963,210	$11,166,016	$16,190,474	$1,463,290	$753,120
Alachua	2,953	2,766	278,675	101,594	1,605,180	543,810	154,000	637,574	1,366,390	88,210	51,640
Baker	396	395	36,200	13,886	214,420	88,860	16,600	116,474	230,213	20,876	16,900
Bradford	1,291	1,225	116,836	39,773	524,830	229,230	41,890	274,376	504,295	24,150	27,620
Brevard	615	572	38,718	7,250	1,649,170	483,590	26,440	160,626	207,942	69,000	88,250
Calhoun	315	312	49,901	19,566	133,500	82,480	20,080	110,224	143,098	4,380	3,540
Citrus	302	296	29,078	7,346	367,210	130,160	17,570	105,770	137,581	8,460	970
Clay	394	392	48,075	7,178	159,870	100,380	17,080	139,460	162,921	4,390	2,280
Columbia	1,596	1,548	205,557	94,037	783,370	316,930	58,530	342,317	663,861	66,750	16,460
Dade	398	341	39,231	4,726	915,570	172,080	24,500	29,198	301,310	72,510	53,300
De Soto	653	636	59,576	10,203	2,048,630	210,070	35,440	794,485	475,664	18,060	23,070
Duval	771	761	66,795	9,609	1,051,830	324,130	39,260	226,653	325,789	29,610	9,040
Escambia	468	467	43,456	7,977	261,350	204,960	29,030	133,796	181,140	10,080	12,360
Franklin	45	45	12,389	2,585	17,010	12,140	2,440	34,284	15,496	860	190
Gadsden	1,532	1,526	212,022	79,135	1,120,710	434,910	250,090	288,145	749,868	47,620	41,770
Hamilton	1,085	1,022	182,781	74,026	672,560	197,840	50,760	252,170	528,622	40,630	21,190
Hernando	363	358	25,453	8,040	156,540	94,410	13,070	98,610	101,689	5,930	590
Hillsboro	1,449	1,411	103,561	22,346	2,590,070	588,970	75,450	364,748	667,678	52,920	50,340
Holmes	875	864	120,291	29,414	214,050	117,260	21,670	159,887	226,630	5,630	10,130
Jackson	3,092	3,068	324,269	144,871	846,319	437,851	122,400	497,872	963,984	67,330	47,090
Jefferson	2,258	2,217	174,142	101,570	712,185	209,495	66,580	293,367	752,723	42,110	8,330
Lafayette	580	575	92,081	25,594	222,010	94,130	22,380	288,963	216,761	7,940	690
Lake	848	816	88,099	22,171	1,181,410	400,610	43,840	175,259	227,451	59,110	14,550
Lee	238	224	24,021	3,337	799,680	116,560	22,930	193,859	236,130	54,140	17,400
Leon	2,428	2,409	207,307	118,930	1,102,067	352,118	92,340	371,634	725,435	53,620	2,140
Levy	795	776	90,457	28,534	278,330	124,380	23,670	287,577	295,621	19,070	620
Liberty	170	170	50,227	10,098	58,510	33,870	8,810	60,218	70,156	4,860	2,020
Madison	2,100	2,055	226,942	119,885	857,985	258,598	80,260	342,018	794,068	72,290	31,370
Manatee	212	195	20,346	4,252	1,466,440	134,420	17,340	110,811	260,653	37,560	30,380
Marion	2,520	2,247	201,472	72,755	1,216,630	704,230	112,080	519,851	947,789	126,610	31,600
Monroe	118	118	12,266	2,129	181,950	43,360	2,530	9,754	246,343	19,530	350
Nassau	361	353	85,815	7,100	123,700	74,370	11,530	113,561	124,586	5,710	2,450
Orange	1,218	1,050	85,509	20,790	2,168,830	659,570	71,580	362,058	855,891	100,480	60,250
Osceola	364	247	55,126	5,251	423,120	66,130	11,080	783,080	229,068	4,980	2,710
Pasco	587	572	45,271	13,669	403,700	181,420	30,540	214,751	257,695	27,430	8,530
Polk	829	806	75,134	17,836	1,013,080	252,300	40,890	452,676	292,282	20,460	25,000
Putnam	799	773	69,234	14,466	437,800	260,910	36,830	208,104	228,296	19,300	6,750
St. John	238	229	20,869	3,737	187,970	84,570	16,480	105,390	106,122	12,470	4,880
Santa Rosa	343	341	51,957	9,385	152,530	113,340	17,230	154,977	138,861	5,100	7,950
Sumter	744	712	81,294	20,525	504,350	152,120	43,390	251,855	289,748	29,360	17,690
Suwanee	1,679	1,656	220,779	102,836	593,990	236,080	62,380	326,302	610,044	34,180	16,200
Taylor	528	528	83,286	21,913	188,560	63,710	13,900	153,568	188,267	6,510	3,630
Volusia	430	421	46,758	10,741	619,790	316,640	32,330	220,568	178,869	49,100	9,290
Wakulla	375	373	72,935	22,710	105,490	54,890	16,020	102,669	112,723	4,420	820
Walton	649	641	95,339	18,502	256,210	114,430	22,120	180,946	206,964	6,670	8,660
Washington	808	755	93,816	29,340	229,590	109,520	28,330	181,918	203,757	8,570	8,740

The number of farms in the state, June 1, 1900, was 6,586 greater than in 1890, the largest relative gains being shown for Monroe, Osceola, Liberty, Lee, and De Soto counties, where the rates of increase were 1,211.1 per cent, 359.7 per cent, 314.6 per cent, 296.7 per cent, and 295.8 per cent, respectively. The percentages of decrease for the counties which report fewer farms than in 1890 are as follows: Volusia, 61.8; St. John, 53.3; Orange, 42.0; Lake, 37.7; Pasco, 31.8; Sumter, 30.0; Putnam, 28.7; Santa Rosa, 12.9; and Polk, 11.5. All of these counties, except Santa Rosa and five others in the central part of the state, show decreases in total farm acreage. The counties showing increases of over 100 per cent are: Monroe, Osceola, Calhoun, Franklin, Walton, Liberty, Taylor, De Soto, Lee, and Brevard. Liberty, Dade, Calhoun, Monroe, and Franklin counties report improved acreages in 1900 from four to twelve times as great as they had in 1890.

The value of farms increased in the southern and western parts of the state, but decreased in most of the central counties. Decreases in the value of land and buildings are shown in all counties of the northern half of the peninsula, the losses being greatest in those counties which suffered most severely from the frosts of 1894, 1895, and 1899.

All counties except Lafayette, Lake, Levy, Orange, Putnam, and Volusia reported a greater value for implements and machinery in 1900 than in 1890. In 1900 the average value per farm was $48.10, and in 1890 it was $33.83. The highest average value was reported by Gadsden county, $162.50, and the lowest by Monroe county, $21.44.

The total value of live stock has increased 56.3 per cent, Manatee, Santa Rosa, St. John, and Volusia being the only counties in which decreases are reported. The largest gains are shown for Osceola, De Soto, and Alachua counties.

The average expenditure per farm for labor, including value of board furnished, varied from $10 in Walton county, to $227 in Lee county, and for the state it was $36. For fertilizers, the average expenditure per farm

was $18 in 1899, and $25 in 1889. Levy county expended an average of only $0.78 per farm. The highest average, $143, was for Manatee county.

INCREASE IN THE NUMBER OF FARMERS IN FLORIDA.

In this bulletin those individuals who, as owners, salaried managers, or tenants, operate farms with or without the assistance of members of their household or of hired laborers, are designated as "farmers." All those working on farms for wages are spoken of as "farm laborers." The number of farmers at any given time corresponds closely to the number of farms.

For every ten years, excepting from 1850 to 1860, and from 1890 to 1900, in which latter decade the agricultural development was temporarily checked by the frosts which so seriously damaged the orchards of the state, the rate of gain in the number of farms, and consequently in the number of farmers, has exceeded that in population. Taking the period since 1850 as a whole, the population of Florida has increased from 87,445 to 528,542, or a little more than sixfold, while the number of farms has advanced from 4,304 to 40,814, an increase of almost tenfold.

These facts, and those contained in Tables 4, 4*a*, and 5, which follow, to be seen in their true relation to the social and economic conditions and changes on Florida farms, must be studied in connection with the occupation tables of the censuses. Those tables are available for 1880 and 1890, but not as yet for 1900. In 1880 the total number of males engaged in agriculture was 47,465, while in 1890 it was 53,558. In 1880, 22,279 of the total number were farm laborers, working for wages, and 1,748 worked for wages at special occupations, such as gardening, fruit growing, etc. In 1890 the number of farm laborers was but 16,783, and the number working at special occupations, 2,547.

These figures show that in 1880 there were on each 1,000 farms in Florida 2,025 males employed in some capacity. Of this number approximately 691 operated farms as owners and 309 as tenants, while 1,025 worked for wages. Ten years later, for each 1,000 farms, 1,565 males were employed, of whom 764 operated farms as owners and 236 as tenants, while 565 worked for wages.

As showing the relative changes in these three classes of farming population, the following comparative statement is presented: For every 1,000 males engaged in agriculture in 1880 there were approximately 341 who operated farms as owners; 153, as tenants; and 506 who worked for wages. In 1890 there were 488 owners, 151 tenants, and 361 wage laborers. It is seen that farm owners and wage laborers practically changed places in relative importance between the two census periods, while the tenant class remained about stationary as compared with the total farming population. As the Eleventh Census, however, in its statistics of farms and homes reported more farm-tenant families than the agricultural division of that census reported tenant-operated farms, it is possible that more exact figures would show a slight increase in the relative number of tenants compared with the total number of males engaged in agriculture in the decade from 1880 to 1890, instead of the decrease given above.

During the decade under consideration the number of males engaged in agriculture increased 12.8 per cent. It may safely be assumed that the total agricultural population increased in about the same proportion. The number of farm owners in the meantime increased 61.4 per cent, the number of tenants 11.7 per cent, while the number of farm laborers decreased 24.7 per cent.

The changes that took place in the relative numbers of these three classes indicate a distinct elevation in the general social and economic level of the total farming population. Whether caused by the rise of the farm wage laborer to farm ownership, as appears probable from the figures reviewed, or by additions to the classes of owners and tenants from other occupations, or through immigration, this elevation is a beneficent change in all its aspects.

The occupation tables for 1900 are not yet prepared, but if the changes in rural population are reliable indices of the changes in the farming population proper, the movements in the decade from 1880 to 1890 were continued with but slight modifications in the last decade; and the average status of the people toiling on Florida farms has been raised even more than is shown by the foregoing comparisons for the preceding decade.

FARM TENURE.

In connection with the changes noted above, attention is called to the specific changes in farm tenure shown in Tables 4, 4*a*, and 5. Table 4 gives a comparative exhibit of the number of farms operated by owners, cash tenants, and share tenants, for 1880, 1890, and 1900. Table 4*a* presents, for the two decades covered by Table 4, the per cent of increase in rural population, in the total number of farms, and in the number of farms of specified tenures. In Table 5 the tenure of farms for 1900 is given by race of farmer, and the farms operated by owners are subdivided into groups designated as farms operated by "owners," "part owners," "owners and tenants," and "managers." These groups comprise respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it, and the other, or others, owning no part, but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

The farms operated by tenants are divided into groups designated as farms operated by "cash tenants" and "share tenants." These groups comprise, respectively: (1) Farms operated by individuals who pay a cash rental or a stated amount of labor or farm produce; (2) farms operated by individuals who pay as rental a share of the products.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES: 1880 TO 1900.

YEAR.	Total number of farms.	NUMBER OF FARMS OPERATED BY—			PER CENT OF FARMS OPERATED BY—		
		Owners.[1]	Cash tenants.	Share tenants.	Owners.[1]	Cash tenants.	Share tenants.
1900	40,814	29,994	7,889	2,931	73.5	19.3	7.2
1890	34,228	26,140	3,936	4,152	76.4	11.5	12.1
1880	28,433	16,198	3,548	3,692	69.1	15.1	15.8

[1] Including "part owners," "owners and tenants," and "managers."

TABLE 4a.—PER CENT OF INCREASE IN RURAL POPULATION, IN THE TOTAL NUMBER OF FARMS, AND IN THE NUMBER OF FARMS OF SPECIFIED TENURES, FOR THE DECADES, 1880 TO 1890 AND 1890 TO 1900, AND FOR THE TWENTY-YEAR PERIOD, 1880 TO 1900.

PERIODS.	PER CENT OF INCREASE IN—					
	Rural population.	Total number of farms.	Number of farms operated by—			
			All owners.	All tenants.	Cash tenants.	Share tenants.
1890–1900	29.8	19.2	14.7	33.8	100.4	[1]23.4
1880–1890	34.1	46.0	61.4	11.7	10.9	12.5
1880–1900	74.0	74.1	85.2	49.4	222.4	[1]20.6

[1] Decrease.

TABLE 5.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.

PART 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE.	Total number of farms.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
The State	40,814	26,423	2,281	280	1,010	7,889	2,931
White	27,288	20,816	1,430	186	917	2,392	1,547
Colored[1]	13,526	5,607	851	94	93	5,497	1,384

PART 2.—PER CENT OF FARMS OF SPECIFIED TENURES.

The State	100.0	64.7	5.6	0.7	2.5	19.3	7.2
White	100.0	76.3	5.2	0.7	3.3	8.8	5.7
Colored[1]	100.0	41.5	6.3	0.7	0.7	40.6	10.2

[1] Including 5 Indians.

Of the farms of the state, 66.9 per cent are operated by white farmers and 33.1 per cent by colored farmers. Of the white farmers, 82.2 per cent own a part or all of the farms they operate, and 17.8 per cent operate farms owned by others. For colored farmers, the corresponding percentages are 48.5 and 51.5.

The relative number of farms rented for cash or for a share of the products is determined largely by local conditions. In counties where diversified farming or stock raising prevails, and where most of the farmers are white, share tenants outnumber cash tenants, but in the leading cotton-growing counties, where colored farmers are the more numerous, the greater number of tenants pay a cash rental. In these latter counties, however, it is difficult to draw the distinguishing line very closely between the two forms of tenancy, since the contract is commonly of such a character as to make the lessee in part a share tenant, and in part a cash tenant. In Florida, as in other southern states, the greater number of these cases of indeterminate tenure were reported as share tenants.

No previous census has reported the number of farms operated by "part owners," "owners and tenants," or "managers," but it is believed that the number of farms conducted by the last-named class is constantly increasing.

PROGRESS OF COLORED FARMERS.

In 1850 the number of colored farmers in Florida was practically a negligible quantity. In 1900 it was 13,526, indicating the rise of substantially that number from the status of slaves or wage laborers to that of farmers.

The Eleventh Census, in its report on "Farms and Homes," gives valuable statistics relating to the number of colored farmers owning and renting farms, the only statistics of the kind which can be used, in connection with Table 5, to throw light upon the changes in the last decade in the average status of negro farmers. Those statistics are not, however, strictly comparable with the statistics of farm tenure collected by the division of agriculture. After making due allowance for variations, a careful comparison indicates that in the last decade the number of colored owners and tenants increased faster than the total negro farming population. The average status of the colored farming population of Florida has been materially advanced since emancipation, and the statistics at present available indicate more rapid progress since 1890 than in any preceding decade.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY TENURE, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	40,814	106.9	4,363,891	100.0	$53,929,064	100.0
White farmers	27,288	133.6	3,646,691	83.5	47,457,291	88.0
Colored farmers[1]	13,526	53.0	717,200	16.4	6,471,773	12.0
Owners	26,423	121.8	3,217,923	73.7	38,137,000	70.7
Part owners	2,281	116.4	265,569	6.1	2,821,117	5.2
Owners and tenants	280	112.4	31,458	0.7	339,151	0.6
Managers	1,010	206.6	208,680	4.8	5,926,681	11.0
Cash tenants	7,889	55.7	439,042	10.1	4,775,118	8.9
Share tenants	2,931	68.7	201,219	4.6	1,930,597	3.6

[1] Including 5 Indians.

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$755	$244	$48	$274	$397	30.0
White farmers	994	324	61	360	476	27.4
Colored farmers[1]	273	84	22	99	236	49.3
Owners	782	270	49	342	440	30.5
Part owners	733	242	49	213	418	33.8
Owners and tenants	699	261	41	210	412	34.0
Managers	4,199	1,129	271	268	637	10.9
Cash tenants	371	95	26	113	256	42.8
Share tenants	387	111	22	139	283	42.9

[1] Including 5 Indians.

Approximately one-third of the farms of the state, comprising about one-sixth of the total farm acreage, are operated by colored farmers. The value of their farm property, however, constitutes less than one-eighth of the value of all farm property in the state. This is, of course, due in part to the fact that the holdings of colored farmers are small, the average size of their farms being but 53.0 acres as compared with 133.6 acres for white farmers. The average value per acre of their farm property, June 1, 1900, was but $9, while for white farmers it was $13. The average values per farm of their land, buildings, implements and machinery, and live stock, also, are relatively low. On the other hand, it appears from Table 7 that they obtained in 1899 a higher per cent of gross income on their investment in farm property than did white farmers.

This apparent anomaly is traceable, in general, to certain distinguishing racial characteristics, and, in particular, to the peculiarities of the contract system under which nearly all colored tenants lease their lands. The first point relates to the recognized tendency on the part of the more progressive white farmer to constantly improve his property, especially his buildings and fences, thus adding to its market value, although not materially increasing its producing capacity per acre. The colored farmer, on the other hand, adds comparatively little to his fixed capital in the way of improvements and his income per acre naturally represents a higher percentage of the capital invested than in the case of the white farmer. In addition, under the prevailing contract system, the white landlord commonly owns the greater portion of the working animals and most of the implements and machinery used by his colored tenants. These being kept for the most part on the farm where the landlord resides, were reported as part of his property, while the products obtained through their use were reported under the names of the tenants.

The farms conducted by cash tenants have the smallest average area, 55.7 acres, and those under managers, the largest, 206.6 acres. Farms of managers have the highest average value, but on account of the high valuation of their land and buildings and the fact that not all of these farms are cultivated primarily for profit, the percentage of income on investment is lower than for any other group.

Of the 5 Indian farmers, 1 was an owner, 2 were managers, and 2 were tenants. The value of their property was $5,286, and of their products, $1,329.

Of the 278 farms, each containing 1,000 acres or over, 200 are operated by owners, 38 by managers, 16 by part owners, 15 by cash tenants, 8 by share tenants, and 1 by an owner and tenant.

FARMS CLASSIFIED BY AREA.

Tables 8 and 9 present the principal statistics for farms classified by area.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

AREA.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	40,814	106.9	4,363,891	100.0	$53,929,064	100.0
Under 3 acres	584	1.6	908	(1)	809,310	1.5
3 to 9 acres	2,292	6.0	13,783	0.3	1,717,062	3.2
10 to 19 acres	3,488	13.2	46,008	1.1	2,845,919	5.3
20 to 49 acres	13,646	34.2	467,062	10.7	10,116,941	18.8
50 to 99 acres	7,874	73.9	581,503	13.3	9,030,653	16.7
100 to 174 acres	7,940	141.2	1,120,791	25.7	11,178,228	20.7
175 to 259 acres	2,259	209.8	472,792	10.8	4,856,002	9.0
260 to 499 acres	1,844	338.7	624,554	14.3	6,370,337	11.8
500 to 999 acres	609	669.4	407,684	9.4	3,247,954	6.0
1,000 acres and over	278	2,261.9	628,806	14.4	3,756,658	7.0

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

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$755	$244	$48	$274	$397	30.0
Under 3 acres	328	239	18	801	387	27.9
3 to 9 acres	420	218	23	88	194	25.9
10 to 19 acres	469	203	28	116	225	27.5
20 to 49 acres	409	144	27	161	274	37.0
50 to 99 acres	645	207	40	255	379	33.0
100 to 174 acres	812	245	47	304	460	32.7
175 to 259 acres	1,188	393	71	498	638	29.7
260 to 499 acres	2,194	536	106	619	814	28.6
500 to 999 acres	3,131	887	198	1,117	1,135	21.3
1,000 acres and over	8,285	2,484	975	1,869	2,714	19.3

The greatest number of farms are in the group containing from 20 to 49 acres each, but the farms containing from 100 to 174 acres each comprise the largest percentage of the total acreage.

The relatively high values of land and buildings for the first three groups are due to the fact that they include most of the city dairies and florists' establishments and many fruit farms under highly intensive cultivation. The high average value of live stock on farms of the first group is due to the fact that among them are some farms the operators of which use large ranges on the public domain, but actually own or rent less than 3 acres of land.

The average gross incomes per acre for the various groups are as follows: Farms under 3 acres, $248.74; 3 to 9 acres, $32.29; 10 to 19 acres, $17.02; 20 to 49 acres, $8.01; 50 to 99 acres, $5.13; 100 to 174 acres, $3.26; 175 to 259 acres, $3.05; 260 to 499 acres, $2.40; 500 to 999 acres, $1.70; 1,000 acres and over, $1.16. In considering the high gross income per acre for farms of less than 3 acres, it should be borne in mind that the incomes of florists' establishments, nurseries, and city dairies, of which this group is largely composed, are determined not so much by the acreage of land used as by the amount of capital invested in buildings, implements, and live stock, and by the amounts expended for labor and fertilizers.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

In Tables 10 and 11 the farms are classified by principal source of income. If the value of the hay and grain raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of products not fed to live stock, the farm is classified as a "hay and grain" farm. If vegetables are the leading crop, constituting 40 per cent of the value of the products, it is a "vegetable" farm. The farms of the other groups are classified in accordance with the same general principle. "Miscellaneous" farms are those whose operators do not derive 40 per cent of their income from any one class of farm products. Farms with no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

PRINCIPAL SOURCE OF INCOME.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	40,814	106.9	4,363,891	100.0	$53,920,064	100.0
Hay and grain	1,722	111.1	191,256	4.4	1,660,260	2.9
Vegetables	4,613	79.1	365,117	8.4	6,589,684	12.2
Fruits	2,760	85.2	235,120	5.4	11,503,696	21.3
Live stock	5,150	131.9	679,423	15.6	9,013,889	16.7
Dairy produce	1,853	98.8	183,046	4.2	2,889,560	5.4
Tobacco	171	261.8	44,680	1.0	1,001,300	1.8
Cotton	9,191	91.3	839,205	19.2	5,756,998	10.7
Rice	65	147.9	9,615	0.2	68,986	0.1
Sugar	66	89.5	5,906	0.1	100,766	0.2
Flowers and plants	15	12.1	182	(1)	55,862	0.1
Nursery products	80	76.9	2,307	0.1	246,020	0.5
Miscellaneous	15,178	119.1	1,803,084	41.4	15,142,545	28.1

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

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$755	$244	$48	$274	$397	30.0
Hay and grain	570	194	35	107	195	21.5
Vegetables	893	291	53	192	535	37.5
Fruits	3,240	662	59	237	536	12.9
Live stock	681	250	48	771	409	28.1
Dairy produce	744	369	52	404	362	29.2
Tobacco	2,879	2,153	965	859	1,581	27.0
Cotton	345	101	38	147	366	56.7
Rice	859	205	39	158	242	22.7
Sugar	1,036	202	70	219	349	22.9
Flowers and plants	2,557	897	186	51	2,049	55.6
Nursery products	5,937	1,889	204	171	4,557	55.6
Miscellaneous	526	206	44	222	855	35.6

With the exception of nurseries, which are few in number, fruit farms show the highest value of land and improvements per farm. They occupy but 5.4 per cent of the total farm area, but constitute 21.3 per cent of the total value of farm property. The percentage of gross income on total investment in farm property, however, is much lower for fruit farms than for the farms of any other group. This is due to the fact that a large number of newly planted orchards having high valuations, but which yielded little or no income in 1899, were classed as fruit farms, thus materially reducing the average gross income per farm for the group.

For the several classes of farms the average values per acre of the products not fed to live stock are: Flowers and plants, $168.84; nursery products, $59.27; vegetables, $6.76; fruit, $6.30; tobacco, $6.05; sugar, $3.90; cotton, $3.39; dairy produce, $3.66; live stock, $3.10; miscellaneous, $2.98; and hay and grain, $1.75.

The wide variations shown in the averages and percentages of gross income are largely due to the fact that in computing gross income no deductions are made for expenses involved in operation. For florists' establishments, nurseries, and market gardens, the average expenditure for such items as labor and fertilizers represents a far larger percentage of the gross income than in the case of "hay and grain," "live-stock," or "miscellaneous" farms. If it were possible to present the average net income, the variations shown would be comparatively slight.

FARMS CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Tables 12 and 13 present data relating to farms classified by the reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	40,814	106.9	4,363,891	100.0	$53,929,064	100.0
$0	989	62.5	61,789	1.4	1,572,840	2.9
$1 to $49	2,696	47.5	128,135	3.0	1,915,250	3.6
$50 to $99	4,171	52.6	219,463	5.0	2,544,180	4.7
$100 to $249	12,920	71.0	917,470	21.0	9,077,880	16.8
$250 to $499	11,616	101.2	1,175,296	26.9	12,144,440	22.5
$500 to $999	6,031	168.2	1,014,162	23.3	11,707,426	21.7
$1,000 to $2,499	1,966	286.7	563,704	12.9	8,412,700	15.6
$2,500 and over	425	667.9	283,878	6.5	6,554,348	12.2

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$765	$244	$48	$274	$397	30.0
$0	1,166	332	23	69		
$1 to $49	476	146	17	71	27	3.9
$50 to $99	372	136	21	81	78	12.7
$100 to $249	392	148	26	137	175	24.9
$250 to $499	558	213	39	236	357	34.1
$500 to $999	1,066	346	72	457	685	35.3
$1,000 to $2,499	2,565	637	133	944	1,445	33.8
$2,500 and over	8,999	2,257	754	3,412	5,684	36.9

Nearly all of the 989 farms reporting no income in 1899 were fruit farms which had been partially abandoned or on which the trees were too young to bear. The high average values of the land and buildings of these farms indicate that some of them were country homes or estates held for pleasure and not for profit. For some of them it was impossible to secure complete reports, as changes in ownership or tenancy had occurred shortly prior to enumeration, and the persons in charge June 1, 1900, could not give definite information concerning the products of the preceding year. The same statements are true concerning some of the farms which reported incomes of less than $100. To this extent the reports fall short of giving a complete exhibit of farm income in 1899.

LIVE STOCK.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the Twelfth Census. The age grouping for neat cattle was determined by their present and prospective relations to the dairy industry and to the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with the figures published in previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS.

LIVE STOCK.	Age in years.	ON FARMS.			NOT ON FARMS.
		Number.	Value.	Average value.	Number.
Calves	Under 1	138,393	$586,919	$4.24	3,186
Steers	1 and under 2	67,292	405,590	6.03	798
Steers	2 and under 3	46,731	404,300	8.65	532
Steers	3 and over	44,516	556,313	12.50	1,257
Bulls	1 and over	19,342	198,998	10.29	172
Heifers	1 and under 2	70,445	458,458	6.51	917
Cows kept for milk	2 and over	78,880	1,048,849	13.31	5,444
Cows and heifers not kept for milk.	2 and over	285,712	2,684,922	9.40	1,996
Colts	Under 1	2,289	42,156	18.83	86
Horses	1 and under 2	2,185	75,232	34.43	56
Horses	2 and over	38,387	2,172,751	56.60	7,448
Mule colts	Under 1	102	3,312	32.47	4
Mules	1 and under 2	377	22,102	58.63	15
Mules	2 and over	13,185	1,049,558	79.60	3,289
Asses and burros	All ages	98	3,445	35.15	59
Lambs	Under 1	21,811	32,433	1.49	168
Sheep (ewes)	1 and over	55,881	109,186	1.95	350
Sheep (rams and wethers).	1 and over	46,828	97,692	2.09	368
Swine	All ages	464,277	702,827	1.51	15,622
Goats	All ages	43,705	32,639	0.75	1,348
Fowls:[1]					
Chickens[2]		1,107,816			
Turkeys		32,869	394,557		
Geese		36,658			
Ducks		6,877			
Bees (swarms of)		39,753	83,827	2.11	
Value of all live stock			11,166,016		

[1] The number reported is of fowls over 3 months old. The value is of all, old and young.
[2] Including Guinea fowls.

The total value of all live stock on farms, June 1, 1900, was $11,166,016. Of this amount 9.4 per cent represents the value of dairy cows; 47.4 per cent, that of other neat cattle; 20.5 per cent, that of horses; 9.6 per cent, that of mules; 6.3 per cent, that of swine; 2.2 per cent, that of sheep; and 4.6 per cent that of all other live stock.

No reports were secured concerning the value of live stock not on farms, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, however, the total value of all live stock in the state, exclusive of the poultry and bees not on farms, would be $12,015,700.

CHANGES IN LIVE STOCK ON FARMS.

The following table shows the changes since 1850 in the number of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS: 1850 TO 1900.

YEAR.	Dairy cows.	Other neat cattle.	Horses.	Mules and asses.	Sheep.[1]	Swine.
1900	78,830	672,481	42,811	13,762	102,709	464,277
1890	113,388	370,176	31,807	9,755	98,275	374,241
1880	42,174	425,196	22,636	9,606	56,681	287,051
1870	61,922	328,993	11,902	8,835	28,599	158,908
1860	92,974	295,086	13,446	10,910	30,158	271,742
1850	72,876	188,209	10,848	5,002	23,811	209,458

[1] Lambs not included.

The number of dairy cows shown in the table for 1900 is 30.5 per cent less than for 1890. It is probable, however, that this decrease is more apparent than real, and that many of the 285,712 "cows and heifers, 2 and over, not kept for milk," were milch cows dry at the time of enumeration or were excluded by a stricter definition of the term "dairy cow" than was used by previous censuses. Many of them were doubtless milked for a part of the year, although not kept primarily for milk. The increase of 90.6 per cent in the production of milk sustains this view.

The number of other neat cattle given for 1900 includes 138,393 calves. It is uncertain whether or not calves were included in previous reports. If not, they should be deducted from the 1900 figures before making comparisons with the reports of previous censuses. Even if this is done an increase would still be shown for the last decade, indicating a marked development of the live-stock industry in recent years.

The remaining classes of live stock reported in the table show steady increases since 1850, except for the Civil War period. The rates of increase since 1890 are as follows: Mules and asses, 41.1 per cent; horses, 34.6 per cent; swine, 24.1 per cent; and sheep, 4.5 per cent.

In comparing the poultry report for 1900 (see Table 14) with that for 1890, it should be borne in mind that in 1900 the enumerators were instructed not to report fowls less than three months old, while in 1890 no such limitation was made. This fact explains the decreases shown in the number of all kinds of fowls except chickens, and the small increase shown for those fowls. Compared with the figures for 1890, the present census shows decreases in the number of fowls as follows: Turkeys, 4.5 per cent; ducks, 27.5 per cent; geese, 2.3 per cent. The number of chickens increased 20.5 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the products of the animal industry.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS IN 1899.

PRODUCTS.	Unit of measure.	Quantity.	Value.
Wool	Pounds	333,898	$66,881
Mohair and goat hair	Pounds	20	8
Milk	Gallons	[1] 9,640,434	
Butter	Pounds	1,886,445	1,468,603
Cheese	Pounds	3,751	
Eggs	Dozens	4,214,186	553,524
Poultry			574,703
Honey	Pounds	677,540	58,500
Wax	Pounds	32,290	
Animals sold			830,657
Animals slaughtered			1,257,648
Total			4,810,524

[1] Includes all milk produced.

The animal products of the state were valued at $4,810,524, or 26.3 per cent of the value of all farm products, and 29.7 per cent of the gross farm income. Of the above amount, 43.4 per cent represents the value of animals sold and of animals slaughtered on farms; 30.5 per cent, that of dairy products; 23.5 per cent, that of poultry and eggs; and 2.6 per cent, that of wool, mohair, honey, and wax.

DAIRY PRODUCTS.

The quantity of milk produced increased 90.6 per cent in the last decade; that of butter, 59.9 per cent; and that of cheese, 116.7 per cent.

Of the $1,468,603, given in Table 16, as the value of all dairy products in 1899, $1,121,787, or 76.4 per cent, represents the value of such products consumed on the farms of the producers, and $346,816, or 23.6 per cent, the amount realized from sales. Of the latter sum, $262,670 was derived from the sale of 1,003,918 gallons of milk; $1,497, from 1,427 gallons of cream; $82,390, from 339,503 pounds of butter; and $259 from 2,912 pounds of cheese.

POULTRY AND EGGS.

Of the total value of the products of the poultry business in 1899, 50.9 per cent represents the value of fowls raised, and 49.1 per cent, that of eggs produced. The number of dozens of eggs reported in 1900 was 51.1 per cent greater than that reported in 1890.

WOOL.

With the exception of the ten years from 1860 to 1870, the production of wool has increased with each decade for half a century. The gain for the last decade was 50.4 per cent. The Tenth Census, which was the first to report the number of fleeces shorn, showed 56,681, having a total weight of 162,810 pounds. In 1899 the number of fleeces shorn was 109,821, and the aggregate weight, 333,898 pounds. The average weight of fleeces was practically the same in 1879 and 1899, being approximately 3 pounds. Wool was reported in all counties except Brevard, Dade, and Lee.

HONEY AND WAX.

The quantity of honey reported in 1900 exceeded that reported in 1890 by 114,554 pounds, or 20.3 per cent. The amount of wax produced increased 19.2 per cent.

HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number for each group, and the average number per farm. In computing the averages presented, only those farms which report the kind of stock under consideration are included.

TABLE 17.—HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS, JUNE 1, 1900.

CLASSES.	HORSES.			DAIRY COWS.		
	Farms reporting.	Number.	Average per farm.	Farms reporting.	Number.	Average per farm.
Total	26,972	42,811	1.6	21,104	73,830	3.7
White farmers	19,536	32,858	1.7	15,987	57,031	4.2
Colored farmers	7,436	9,953	1.3	5,117	11,799	2.3
Owners[1]	21,004	34,833	1.7	16,964	64,555	3.8
Managers	380	724	1.9	263	1,912	7.3
Cash tenants	4,136	5,806	1.3	3,015	8,102	2.7
Share tenants	1,452	1,948	1.3	862	4,261	4.9
Under 20 acres	2,956	3,809	1.3	2,114	8,251	3.9
20 to 99 acres	14,101	19,929	1.4	10,207	31,145	3.1
100 to 174 acres	5,957	9,985	1.7	4,966	15,127	3.0
175 to 259 acres	1,767	3,586	2.0	1,637	7,995	4.9
260 acres and over	2,191	5,412	2.5	2,185	16,312	7.5
Hay and grain	899	1,192	1.3	397	1,132	2.9
Vegetable	3,017	4,690	1.6	1,765	4,349	2.5
Fruit	1,413	2,217	1.6	730	2,281	3.1
Live stock	4,002	7,648	1.9	3,023	14,402	4.8
Dairy	1,377	2,373	1.7	1,853	15,919	8.6
Tobacco	124	267	2.2	105	305	2.9
Cotton	5,251	7,413	1.4	3,567	9,513	2.7
Rice	47	64	1.4	18	58	3.2
Sugar	41	71	1.7	27	95	3.5
Florist	5	6	1.2	4	9	2.2
Nursery	12	17	1.4	11	32	2.9
Miscellaneous	10,784	16,858	1.6	9,554	30,695	3.2

[1] Including "part owners" and "owners and tenants."

CROPS.

The following table gives statistics concerning the principal crops grown in 1899.

TABLE 18.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

CROPS.	Acres.	Unit of measure.	Quantity.	Value.
Corn	569,567	Bushels	5,311,050	$2,669,509
Wheat	85	Bushels	800	601
Oats	31,467	Bushels	297,430	143,028
Barley	27	Bushels	320	318
Rye	764	Bushels	4,840	5,514
Buckwheat	2	Bushels	30	30
Rice	5,410	Pounds	2,254,492	87,332
Grass seed		Bushels	37	37
Hay and forage	21,994	Tons	37,187	435,297
Cotton (upland)	99,038	Bales[1]	30,283	926,558
Cotton (sea island)	122,793	Bales[1]	31,573	1,665,288
Cottonseed (upland)		Tons	14,702	153,960
Cottonseed (sea island)		Tons	12,211	149,774
Broom corn	34	Pounds	3,390	174
Tobacco	2,056	Pounds	1,125,600	254,211
Dry beans	8,189	Bushels	176,304	139,849
Dry peas	17,575	Bushels	159,814	171,702
Peanuts	69,452	Bushels	967,927	599,713
Potatoes	8,752	Bushels	282,212	187,274
Sweet potatoes	22,791	Bushels	2,049,784	898,282
Onions	159	Bushels	18,728	18,827
Cassava	755			22,562
Cassava seed				1,729
Miscellaneous vegetables	25,848			1,911,634
Sugar cane	12,800	Tons	[2]1,157	5,194
Sugar cane kept for seed		Tons	55,200	193,200
Sugar		Pounds	284,300	12,744
Sirup		Gallons	1,687,452	512,038
Small fruits	1,343	Quarts	1,770,980	189,867
Grapes	[3]535	Centals	16,847	[4]56,420
Orchard fruits	[3]2,038	Bushels	228,458	[5]192,898
Tropical fruits	[3]39,014			945,607
Nuts				8,453
Forest products				648,412
Flowers and plants	46			41,417
Seeds	21			8,622
Nursery products	603			122,140
Miscellaneous				24,470
Total	1,059,515			13,498,580

[1] Commercial bales.
[2] Sold as cane.
[3] Estimated from the number of vines or trees.
[4] Including value of wine, raisins, etc.
[5] Including value of cider, vinegar, etc.

Of the total value of crops, vegetables, including potatoes, sweet potatoes, and onions, contributed 22.3 per cent; cereals, 21.5 per cent; cotton, 21.5 per cent; fruits and nuts, 10.3 per cent; peanuts, 5.2 per cent; forest products, 4.8 per cent; sugar cane and its products, 5.4 per cent; hay and forage, 3.2 per cent; tobacco, 1.9 per cent; and all other products, 3.9 per cent.

The average gross values per acre of the various crops are as follows: Tobacco, $123.64; vegetables, $57.89; sugar cane and its products, $56.50; fruits and nuts, $32.45; hay and forage, $19.79; cotton, $13.05; peanuts, $10.07; cereals, $4.79.

VEGETABLES.

The value of all vegetables grown in the state in 1899, including potatoes, sweet potatoes, and onions, was $3,016,067, which amount constitutes 16.5 per cent of the total value of farm products. Of the total value of vegetables, 29.8 per cent represents the value of sweet potatoes, and 6.2 per cent that of Irish potatoes. The largest quantities of sweet potatoes were raised in Alachua, Marion, and Leon counties, which reported 24.9 per cent of the total acreage. Since 1889 a gain of 17.2 per cent is shown in the production of sweet potatoes, and of 213.4 per cent in the production of Irish potatoes.

Aside from the land devoted to potatoes, sweet potatoes, and onions, 25,848 acres were used in the growing of miscellaneous vegetables. The products of 4,933 acres of this area were not reported in detail. Of the remaining area, 8,728 acres were devoted to watermelons; 4,401, to tomatoes; 2,437, to beans; 2,087, to muskmelons; 1,103, to cucumbers; 981, to cabbage; 548, to lettuce; and 630, to other vegetables.

CEREALS.

The following table is an exhibit of the changes in cereal production since 1849.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS: 1849 TO 1899.

PART 1.—ACREAGE.

YEAR.[1]	Barley.	Corn.	Oats.	Rice.	Rye.	Wheat.
1899	27	569,567	31,467	5,410	764	85
1889	9	378,906	42,003	1,787	853	32
1879	21	360,294	47,962	2,551	601	81

[1] No statistics of acreage were secured prior to 1879.

PART 2.—BUSHELS PRODUCED.[2]

1899	320	5,311,050	297,430	2,254,492	4,840	800
1889	128	3,701,264	891,321	1,011,805	13,389	290
1879	210	3,174,294	468,112	1,294,677	2,965	422
1869	12	2,225,056	114,204	401,687	545	
1859	8,369	2,834,491	46,899	223,704	21,306	2,808
1849		1,996,809	66,586	1,675,090	1,152	1,027

[2] Rice reported in pounds.

In 1899 the total area devoted to cereals, including rice, was 607,322 acres; in 1889 it was 423,590 acres; and in 1879, 411,510 acres. The gain in twenty years amounts to 47.6 per cent, of which 30.3 per cent took place in the last decade.

The principal cereal grown is corn, and each decade shows an increased acreage, the gain for the last decade amounting to 50.3 per cent. In 1900 the extreme northern

counties—Columbia, Hamilton, Madison, Jefferson, Leon, Gadsden, and Jackson—reported 51.3 per cent of the acreage and 51.9 per cent of the product of that crop for the state.

Of the total acreage in oats, 56.0 per cent was reported by Madison, Marion, Leon, Columbia, Alachua, and Jackson counties, each having over 2,000 acres and ranking in the order named. A decrease of 25.1 per cent is shown for the state.

All counties except Dade and Monroe reported rice in 1899. The largest acreage was in Hillsboro county, which reported 592 acres with a yield of 455,542 pounds. Marion county reported the next largest area, 492 acres, with a yield of 168,298 pounds.

In addition to the cereals shown in Table 19, 2 acres of buckwheat, with a product of 30 bushels, were reported.

COTTON.

Table 20 is an exhibit of the changes in cotton production since 1849.

TABLE 20.—ACREAGE AND PRODUCTION OF COTTON: 1849 TO 1899.

YEAR.[1]	ACREAGE.		PRODUCTION.		
	Total.	Per cent of decrease.	Commercial bales.	Pounds.	Per cent of increase.
1899	221,829	2.4	61,856	26,996,884	[2]2.3
1889	227,370	7.4	57,928	27,631,656	10.9
1879	245,595	----------	54,997	24,915,641	44.3
1869	----------	----------	39,789	17,268,426	[2]40.4
1859	----------	----------	65,153	28,993,085	60.6
1849	----------	----------	45,131	18,052,400	----------

[1] No statistics of acreage were secured prior to 1880.
[2] Decrease.

The total area devoted to the cultivation of cotton in 1899 was 221,829 acres. The total production was 61,856 commercial bales, or 26,996,884 pounds, an average of 0.279 bale or 121.7 pounds per acre. In 1889 the total area was 227,370 acres, and the total product was 57,928 commercial bales, or 27,631,656 pounds, an average of 0.255 bale or 121.5 pounds per acre. There were decreases of 2.4 per cent and 2.3 per cent, respectively, in the last decade in acreage and production. For the decade from 1880 to 1890, there was an increase of 10.9 per cent in production, although the acreage decreased 7.4 per cent.

Of the total acreage in 1899, 99,036 acres, or 44.6 per cent, were devoted to the cultivation of upland cotton, while 122,793 acres, or 55.4 per cent, were used for sea-island cotton. Of the total product, upland cotton comprised 30,283 bales, or 14,940,617 pounds, and sea-island cotton, 31,573 bales or 12,056,267 pounds.

No cotton whatever was reported by any county lying wholly south of the twenty-eighth parallel, and only 65 bales were grown in counties lying south of the twenty-ninth parallel. The eight counties of Jackson, Jefferson, Leon, Madison, Columbia, Alachua, Suwanee, and Hamilton reported 82.9 per cent of the total acreage and 82.6 per cent of the total number of bales produced in the state. The largest area in cotton for any single county—29,508 acres—was reported by Jackson county. In 1889 this county reported 25,272 acres. In 1889 Jefferson county had the largest area, 30,356 acres, while in 1899 the area grown was 27,761 acres, a loss for the decade of 8.5 per cent.

The total value of the cotton produced represents 17.9 per cent of the gross farm income. Of the total number of acres of improved land in the state, 14.7 per cent were used in the cultivation of cotton.

SUGAR CANE AND ITS PRODUCTS.

Table 21 presents a comparative exhibit of the acreage of cane and the production of sugar and sirup, 1849 to 1899.

TABLE 21.—ACREAGE OF CANE, AND PRODUCTION OF SUGAR AND SIRUP: 1849 TO 1899.

YEAR.[1]	Acreage in cane.	SUGAR.		SIRUP.	
		Production in pounds.	Average yield per acre in pounds.	Production in gallons.	Average yield per acre in gallons.
1899	12,800	284,300	22.2	1,687,452	131.8
1889	9,345	1,692,015	181.1	1,441,744	154.3
1879	7,938	1,527,600	192.4	1,029,868	129.7
1869	----------	1,142,400	----------	344,339	----------
1859	----------	2,002,800	----------	436,357	----------
1849	----------	3,300,000	----------	----------	----------

[1] No statistics of acreage were secured prior to 1879.

In comparing the sugar statistics of 1900 with those of previous censuses it should be considered that about 60.0 per cent of the crop of 1899 was destroyed by frost. The area devoted to sugar cane increased from 9,345 acres in 1889 to 12,800 acres in 1899, a gain for the decade of 37.0 per cent. Accepting the estimate of a 60.0 per cent loss as approximately correct, a normal year would have given to Florida a total of 710,750 pounds of sugar and 4,218,630 gallons of sirup as a product for the acreage reported.

Each decade shows an increase in the quantity of sirup manufactured, while the production of sugar is rapidly declining, indicating that the planters find sirup the more profitable product. The manufacture of sugar and sirup in Florida is carried on entirely by the "open-kettle" process. The sirup produced by this method is of superior quality and commands a good price, while the sugar is of the brown variety and is rated low commercially.

The largest production of sugar, 25,300 pounds, was reported by Duval county, and the largest quantity of sirup, 166,956 gallons, was made in Gadsden county. The latter county also leads in total value of product, the value reported in 1900 being $43,264. Alachua county ranks second with a production of 112,945 gallons of sirup, valued at $36,066. The total value of the sugar and sirup produced in the state represents 3.2 per cent of the gross farm income.

SEMITROPICAL FRUITS.

The changes in production of semitropical fruits since 1889 are shown in the following table.

TABLE 22.—SEMITROPICAL TREES AND FRUITS: 1890 AND 1900.

FRUIT.	NUMBER OF TREES.		QUANTITIES OF FRUIT.		
	1900.	1890.	Unit of measure.	1899.	1889.
Figs	9,433	20,109	Pounds	66,680	(1)
Guavas	106,025	21,448	Pounds	1,645,795	(1)
Kaki	3,271	38,729	Pounds	75,110	(1)
Lemons	22,691	85,052	Boxes	2,359	252,948
Limes	41,741	17,089	Boxes	22,714	46,294
Oranges	2,552,542	2,725,272	Boxes	273,295	3,146,740
Pineapples	[2]14,578,597	[2]21,605,000	Number	2,863,140	10,452,499
Pomeloes	117,336	3,135	Boxes	12,306	[3]10,080
Olives	8,186		Pounds	250	
Miscellaneous	34,731		Pounds	112,670	

[1] No product reported in 1890.
[2] Plants.
[3] Barrels.

The value of semitropical fruits grown in Florida in 1889 was $5,930,787. For 1899 the corresponding value was $945,607, a loss in ten years of 84.1 per cent. The cold wave of the winter of 1894–95, and the severe frost in February of 1899, resulted in the destruction of about three-quarters of the orange trees of the state. The orange groves of Columbia, Bradford, and St. John counties were almost entirely destroyed, and the counties of Alachua, Marion, Putnam, and Sumter lost about nine-tenths of their trees. In this region, Lake was the only county that escaped with as small a loss as 40.0 per cent of its groves. Although much farther south, the losses in Polk county amounted to about 70.0 per cent, and the gulf counties, Levy, Citrus, Hernando, and Pasco, lost about 90.0 per cent of their trees. Baker, Dade, Lafayette, Lee, Manatee, and Monroe counties each show a slight increase since 1889 in the number of orange trees.

In 1889 the four counties of De Soto, Hillsboro, Lee, and Manatee comprised but 6.3 per cent of the orange-growing area of the state, and their production was commercially insignificant. In 1899 these four counties contained 20.9 per cent of all the orange trees, and produced 245,454 boxes of oranges or 89.8 per cent of the total production for the state.

The pineapple industry still centers in Brevard and Dade counties as it did in the preceding census year, 81.1 per cent of the entire number of plants grown in the state in 1899 being reported by these two counties. Since 1890 there has been an increase in the number of plants amounting to 55.3 per cent in Brevard county, and to 61.4 per cent in Dade county. A decrease is shown in the total number of plants, however, owing to the exaggerated number reported from Monroe county in 1890.

Olive trees are grown in Florida for ornamental or experimental purposes only. The 250 pounds of olives shown in the tables were reported by two farmers in Osceola county. In addition to the trees shown in Table 22, unclassified semitropical fruit trees to the number of 34,731 were reported, with a yield of 112,670 pounds of fruit.

ORCHARD FRUITS.

The following table shows the changes in orchard fruits since 1890.

TABLE 23.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

FRUITS.	NUMBER OF TREES.		BUSHELS OF FRUIT.	
	1900.	1890.	1899.	1889.
Apples	8,219	7,025	1,866	2,610
Apricots	524	1,448	68	15
Cherries	1,495	333	112	12
Peaches	354,208	235,936	92,113	230,290
Pears	208,145	49,295	83,584	84,265
Plums and prunes	107,720	36,688	47,840	13,356

Among temperate orchard fruits some interesting changes are to be noted. The entire number of trees has a little more than doubled within the past ten years, rising from about one-ninth of the number of orange trees in 1890 to more than one-fourth in 1900.

In this class peach trees are far the most important. They constituted about 71.0 per cent of all orchard trees in 1890, but only 50.2 per cent in 1900. This change is the result of the greater relative increases in other fruits, especially in pear and plum trees, which increased from 49,295 and 36,688, respectively, in 1890, to 208,145 and 107,720 in 1900, thus coming into the same general grade of importance with peach trees. Apples, cherries, and apricots are of minor importance. Increases were reported in the number of trees of all kinds, except apricots, as follows: Apples, 17.0 per cent; cherries, 348.9 per cent; peaches, 50.1 per cent; pears, 322.2 per cent; plums and prunes, 193.6 per cent. The rate of decrease in the number of apricot trees is 63.8 per cent.

The counties that report more than 10,000 peach trees each are Alachua, Clay, Duval, Escambia, Gadsden, Hillsboro, Jackson, Lake, Marion, Polk, Putnam, Santa Rosa, Taylor, and Walton, in the northern and central parts of the state. The large increases in the number of pear and plum trees indicate that farmers are realizing that the soil and climate of Florida are well adapted to the culture of these fruits. The largest number of pear trees, 16.3 per cent of the total number, was reported by Leon county. Marion county reported 13.5 per cent of all the plum and prune trees. Gadsden, Jackson, and Santa Rosa counties reported almost one-half of all the apple trees. In addition to the trees shown in Table 23, unclassified fruit trees to the number of 3,769 were reported, with a yield of 2,870 bushels of fruit.

The value of orchard products, given in Table 18, includes the value of 708 barrels of cider, 298 barrels of vinegar, and 4,870 pounds of dried and evaporated fruits.

SMALL FRUITS.

The total area used in the cultivation of small fruits in 1899 was 1,343 acres, distributed among 1,669 farms. The value of the fruits grown was $189,867, an average of $113.76 per farm reporting.

Of the total area in small fruits all but 30 acres were devoted to strawberries, the yield being 1,731,730 quarts. Bradford county, near the northern border of the state, and Hillsboro, Polk, and Pasco counties, in the east central portion, contained 74.3 per cent of the total acreage devoted to this fruit, and reported 75.6 per cent of the total

product. Of the remaining 30 acres, 5 were used for raspberries, and 25 for other small fruits.

TOBACCO.

Tobacco was grown for the market in Florida as early as 1840, and in the decade from 1850 to 1860 its culture became an important industry in certain sections of the state. The Florida "speckled-leaf," differing from the Connecticut "seed-leaf" or "broad-leaf" chiefly in its spotted appearance, was the principal variety grown. After 1860 the industry declined rapidly, and, largely on account of the competition of Sumatra tobacco and the difficulty in controlling labor, was soon practically abandoned.

Since 1885 the introduction of Cuban and Sumatran seed and careful experimentation have revived the industry. In 1889, 1,190 acres were devoted to the crop and 470,443 pounds of tobacco were gathered. In 1899, 998 farmers devoted 2,056 acres to tobacco and gathered a crop of 1,125,600 pounds. The acreage increased 72.8 per cent in the decade and the production more than doubled. Gadsden is the leading county in tobacco culture, having reported in 1900, 84.5 per cent of the total acreage and 90.8 per cent of the total product.

PEANUTS.

In 1899, 967,927 bushels of peanuts, valued at $699,713, were grown on 69,452 acres of land. In 1889, 359,555 bushels were obtained from 26,166 acres, the average yield per acre in both years being approximately 14 bushels. Jackson county had the largest acreage in both years, having reported in 1889, 3,224 acres and a yield of 29,050 bushels, and in 1899, 12,003 acres and a yield of 130,619 bushels. Suwanee county ranked second in 1899 in both acreage and production, having reported 5,779 acres and 90,519 bushels. Ten years before Alachua county ranked second and Suwanee county, sixth. In the present census Alachua county ranks third in acreage.

FLORICULTURE.

The total value of plants and flowers grown by the operators of the 44 farms from whom reports on this industry were received was $41,417. Only 15 of the 44 were commercial florists, the others having raised flowers or plants incidentally in connection with their farming operations. In 1899 the income derived by these 15 establishments from the sale of flowers and plants was $27,309, and that from other products was $3,429. The total capital invested by them in land was $38,350; in buildings, $13,450; in implements, $2,790; and in live stock, $772.

Of the total area of 74,960 square feet of land under glass, reported by the operators of 31 farms, 59,962 square feet, equivalent to 79,950 square feet of glass surface, were used by the 15 commercial florists.

NURSERIES.

The 30 nurseries in the state yielded, in 1899, a gross income of $136,726, of which $118,622 was derived from the sale of trees, shrubs, and vines, and $18,104 from other products. The acreage reported by nurserymen was 2,307, making the average income per acre $59.27.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899, including the value of board furnished, was $1,468,290, an average of $36 per farm. The average was highest on the most intensively cultivated farms, being $922 for nurseries, $601 for florists' establishments, $441 for tobacco farms, $108 for fruit farms, $81 for sugar plantations, $58 for market gardens, $27 for rice farms, and $24 for cotton farms. Managers expended, on an average, $290; owners, $33; cash tenants, $16; and share tenants, $15. White farmers expended $49 per farm, and colored farmers, $10.

Fertilizers purchased in 1899 cost $753,120, an average of $18 per farm, and a decrease since 1890 of 12.2 per cent. The average expenditure was greatest for nurseries, and least for hay and grain farms. For nurseries the average was $280; for tobacco farms, $123; for florists' establishments, $113; for fruit farms, $63; for market gardens, $45; and for cotton plantations, $12.

IRRIGATION STATISTICS.

Irrigation occupies a position of growing importance in the agricultural economy of Florida. It is a comparatively recent innovation, having been first resorted to in 1888 by the orange growers. The results were apparently so satisfactory that the number of irrigators has increased from year to year.

Until the disastrous "freeze" of 1894–95, irrigation was confined almost entirely to orange groves, but with the destruction of thousands of orange trees, many of the irrigation systems were thrown out of use, and the attention of irrigators was turned to the industry of truck farming. In this industry the need of irrigation was quickly felt, as the products of truck farms are of large commercial value, and even a partial loss of crops is very costly. The cultivation of fruits and vegetables has proved most profitable, and the development of these branches of agriculture has been very rapid, giving a great impetus to the use of irrigation. At the present time by far the greater number of irrigation plants in the state are used by truck farmers and growers of small fruits.

Although it has a heavy mean annual rainfall, Florida is subject to severe droughts, especially during the growing period between February and June. In the sections where irrigation is reported, the soil is naturally nonretentive of moisture, and, owing to the great heat, evaporation is excessive.

The state appears to be underlaid by artesian waters at depths varying from 25 to 500 feet below the surface. Where these waters have been tapped the supply is found to be ample, many of the wells flowing with considerable pressure and great volume. In most cases no cost of pumping is entailed in irrigation, and the expense of maintaining the plant is very slight. The usual cost of one well, including drilling, casing, cement pipes, and everything required to complete a plant capable of irrigating 10 acres, is about $500.

The system employed on the leading farms is as follows: Continuous underground cement pipes are laid from the wells to hydrants, plugs, or standpipes, from which the water is distributed in small furrows between rows. These pipes are made and laid at the same time by a machine, in trenches previously prepared, and extend without break to any desired part of the field. The pipe itself is composed of two parts sand and one part cement, with a usual inside measurement of 3 inches, and an outside measurement of 6 inches, and costs about 10 cents per foot. In a few sections the water is pumped by windmills into tanks, whence it is distributed over the land through iron pipes or wooden troughs. Gasoline engines and rotary pumps are sometimes used instead of windmills. A well, with its equipment of gasoline engine, rotary pump, and iron pipe sufficient to irrigate 3 acres, costs about $500. Using gasoline, at 14½ cents per gallon, as a fuel, such a plant will deliver 2,000 gallons per hour, at an average cost of 4 cents per hour.

The most extensive irrigation systems in the state are located in Gadsden county, and belong to two companies engaged in the cultivation of Sumatra tobacco. The cost of constructing these plants, which irrigate 250 acres of tobacco, was $36,250. In 1899 the value of the tobacco grown was $91,000. The water for these plants is pumped by steam from several small creeks into reservoirs, from which it is distributed through ditches by gravity. One of the companies has perfected an elaborate plan of distribution through troughs and overhead sprays, the water being supplied in a manner very similar to that of natural rainfall.

Among the humid states where irrigation was practiced in 1899, in growing general crops, Florida ranked first in the area irrigated, in cost of plants, and in value of irrigated crops. In that year there were 180 irrigated farms, 166 of which reported irrigated products. On 14 farms 53 acres of nonbearing orange trees and pineapples were irrigated. Forty-three irrigation systems, representing an aggregate cost of $78,525, and covering 751 acres, were not operated in 1899. The value of the products of the 1,485 acres irrigated was $302,870, or an average of $203.95 per acre. The total cost of the pumping systems, ditches, and wells was $232,388, or an average of $101.52 per acre. The following table presents statistics of irrigation for a number of the leading counties in the state.

IRRIGATION STATISTICS.

COUNTIES.	Number of farms irrigated.	Number of acres irrigated.	Cost of systems.	IRRIGATED PRODUCTS.		
				Acres.	Value.	Average value per acre.
The State	180	1,538	$232,388	1,485	$302,870	$204
Alachua	8	84	7,850	84	10,876	320
Brevard	22	111	17,800	103	6,730	65
Dade	7	57	13,200	57	652	11
De Soto	8	62	7,060	62	6,388	103
Gadsden	8	252	36,600	252	91,176	862
Hillsboro	15	80	8,775	75	14,999	200
Lake	4	21	10,250	21	640	30
Lee	6	82	10,300	76	10,378	136
Manatee	57	666	42,978	641	107,602	168
Orange	18	56	54,315	53	15,611	295
Polk	5	42	5,650	42	4,850	115
All other counties	27	75	17,615	69	32,978	478

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 166. WASHINGTON, D. C. May 5, 1902.

MANUFACTURES.

SHIPBUILDING.

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

SIR: I transmit herewith, for publication in bulletin form, a report on shipbuilding and repairing, prepared under my direction by Mr. Alexander R. Smith, of New York, acting in the capacity of an expert special agent of the division of manufactures of the Census Office.

The statistics for the shipbuilding industry were reported at the census of 1890 under four subdivisions, that is: Iron and steel vessels; wooden vessels; boats, masts, and spars; and repairs of vessels. In 1900 it was decided to assign the reports for the industry to the two groups, iron and steel vessels, including their repairing, and wooden vessels, boats, oars, masts, and spars, including repairing. The statistical tables embodied in this report include only such data as relate to ship construction and repairs, and the equipment of vessels, without reference to the trade in which the vessels constructed might be engaged, whether foreign or domestic. Reference has been made, however, in the discussion of the data, to the Treasury Department statistics, giving separately the tonnage of American vessels engaged in foreign and domestic trade. These statistics seem to show that however gratifying in other respects the increase in shipbuilding in the United States may be (and the addition to the merchant marine was considerable during the census year), the addition to the tonnage in foreign trade by new construction was insufficient to make up for the loss of such tonnage from natural and common causes, and that the decline in American shipbuilding for foreign trade, which has been so marked for half a century, has not been arrested.

It has been found impossible to separate the statistics relating to merchant and naval vessels when both are constructed in private shipyards. The tonnage of the latter is, however, of large proportions, and should be taken into account in any consideration of the statistics from the standpoint of the uses in which the new ships are employed. During the decade the relative positions of the two branches of the industry—wooden shipbuilding and iron and steel shipbuilding—have been reversed, the latter for the first time occupying the leading position in the tonnage and value of vessels constructed. In this connection the tonnage of barges is not considered.

The statistics of this industry are presented in 23 tables: Table 1 showing comparative figures for the industry at the several censuses; Table 2 showing totals for all establishments divided between iron and steel shipbuilding, wooden shipbuilding, governmental establishments, and establishments with a product of less than $500, which latter class was not reported at previous censuses; Tables 3, 4, and 5, comparative statistics of governmental establishments, iron and steel shipbuilding, and wooden shipbuilding, respectively, for 1890 and 1900; Table 6, comparative statistics of both branches of the industry combined, by states, for 1890 and 1900; Tables 7 and 8, detailed statistics of materials and products for iron and steel and for wooden shipbuilding establishments, respectively; Tables 9, 10, 11, and 12, summaries of shipbuilding on the Great Lakes, presenting, respectively, statistics of both branches of the industry combined, of iron and steel shipbuilding, of wooden shipbuilding, and of iron and steel shipbuilding in 1900 and 1890; Table 13, statistics of wooden

ship and boat building in cities of 20,000 population and over; Table 14, capital invested; Table 15, percentages that the several items for each branch of the industry form of the corresponding totals for the entire industry; Table 16, cost of the several materials used and percentage of total cost; Table 17, number of establishments engaged exclusively in small boat construction and repair, with capital and value of products, by states; Table 18, number of establishments engaged exclusively in repair work, with capital and value of products, by states; Table 19, statistics of transportation companies engaged in construction and repair of their floating equipment, by states; Table 20, number and value of small boats constructed, by states; Tables 21, 22, and 23, detailed statistics, by states, for iron and steel shipbuilding, wooden shipbuilding, and shipbuilding by governmental establishments, respectively.

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

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

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

Furthermore, the schedules for 1890 included in the wage-earning class, overseers, foremen, and superintendents (not general superintendents or managers), while the census of 1900 separates from the wage-earning class such salaried employees as general superintendents, clerks, and salesmen. It is possible and probable that this change in the form of the question has resulted in eliminating from the wage-earners, as reported by the present census, many high-salaried employees included in that group for the census of 1890. With the exception of these and several other changes in the special features of the schedules, which do not affect the value of the statistics for comparative purposes, the investigation has been conducted along the lines followed at the census of 1890.

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

The reports show a capital of $77,362,701 invested in the 1,116 establishments reporting for the industry. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the corporations. The value of the products is returned at $74,578,158, to produce which involved an outlay of $2,008,537 for salaries of officials, clerks, etc.; $24,839,163 for wages; $3,685,661 for miscellaneous expenses, including rent, taxes, etc.; and $33,486,772 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of the products during the census year. The census schedule takes no cognizance of the cost of selling, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

Very respectfully,

Chief Statistician for Manufactures.

SHIPBUILDING.

By Alexander R. Smith, *Expert Special Agent.*

The growth of the shipbuilding industry in the United States during the past ten years, as shown by the census reports, exceeds that of any preceding decade, and the tonnage constructed during the census year ending May 31, 1900, was greater than during any preceding year in the history of the United States, with the possible exceptions of 1854 and 1855. Although in other countries iron and steel long ago largely superseded wood as the chief material used in the construction of ships, the census statistics show that it was not until the last decade that metal shipbuilding attained proportions greater than wooden in the private shipyards of the United States.

This substitution of iron and steel for wood has wrought a revolution in the shipbuilding industry in the United States. The zenith of American shipbuilding, judged by the tonnage annually added to the merchant marine, was reached during the decade between 1850 and 1860. At that time the superiority of ships built in the United States for endurance, speed, and safety was conceded. It was the era of the American clipper. This class of wooden sailing ships commanded higher freight rates, even in Liverpool and London, than British ships, and insurance rates on American vessels and their cargoes were lower than on foreign ships. These advantages placed the United States in the very front rank in international trade-carrying competition. This prestige had been increasing ever since the successes achieved by the United States in the carrying trade during the Napoleonic wars. The easy convertibility of the wooden vessels of that time into ships of war gave a distinct naval strength and solidity to the nation. The passing of wooden shipbuilding, therefore, as the dominant branch of the shipbuilding industry in the United States, has an historical significance.

One remarkable feature of the growth of the industry during the past decade is the fact that the product of merchant vessels has been so largely absorbed and employed in the domestic commerce of the country. Up to the time of the Civil War the tonnage of vessels constructed in American shipyards for the foreign trade compared favorably with that for the domestic trade; and, indeed, the progress and prosperity of the industry rested largely upon the demands for vessels for foreign commerce. This is no longer true. Comparatively few vessels for foreign trade are now built in American shipyards. But in the meantime the enormous growth of internal commerce, together with the opportunities afforded by the extensive coast line of the United States, the Great Lakes, and the navigable rivers, which in many cases have been so deepened, at an expense reaching into hundreds of millions of dollars, as to accommodate the passage of the largest vessels, has greatly developed the demand for vessels in the domestic trade. This has not only kept alive our shipbuilding industry, but constitutes also, in large part, the foundation upon which it has expanded. Another important element in the growth of the industry has been the demand of the Government for a new Navy constructed in home shipyards.

During the last four decades, therefore, the stability of the industry in the United States has rested almost wholly upon the domestic or coastwise trade, the vessels constructed for foreign trade representing but a small proportion of the entire output of the shipyards. Whether or not this is due to the fact that the domestic water-borne trade of the United States has by law been restricted to vessels built in the United States, need not here be discussed. These restrictions have existed since the foundation of the Government, at first by statutory discriminations in favor of home vessels that practically excluded foreign tonnage, and, ever since the early part of the Nineteenth century, by statutory prohibition. Under such restrictions shipbuilding for the internal commerce of the United States has grown and prospered. On the other hand, in the foreign trade, to which foreign vessels for many years have been admitted upon terms of perfect equality with those of the United States, the foreign tonnage has maintained an almost constant increase, while the domestic tonnage has steadily diminished.

The completeness of the decline of American shipping in the foreign trade may be briefly illustrated by quotations from the statistical history of the growth of the foreign commerce of the United States, showing the share in its carriage taken by American ships in the earlier years compared with the present time. In 1826 American vessels carried 92.5 per cent of the foreign

commerce of the United States, the value of which was $150,331,636, while in 1900 they carried 9.3 per cent, the value of which was $195,083,155, an increase in value of only 29.5 per cent in seventy-four years. In 1826 foreign vessels carried 7.5 per cent of our foreign commerce, valued at $12,238,163, while in 1900 they carried 90.7 per cent, valued at $1,894,445,461, an increase of 15,379.8 per cent in seventy-four years.[1]

While the census returns do not indicate the particular trade in which the vessels built are to engage, other official records are at hand which in part supply the information. For instance, no vessel is permitted to engage in foreign trade unless provided with a register, a document issued by the Government through its custom houses. Hence the American shipping under register accurately shows the total tonnage of the United States engaged in the foreign trade. The returns for the Twelfth Census show that the vessels of all kinds—sail and steam, steel and wood, including barges and canal boats—constructed in the shipyards of the United States in 1900 numbered 2,087, with a gross tonnage of 687,681 tons. The report of the Commissioner of Navigation for 1900[2] shows that 88 American-built vessels, with a total of 29,069 gross tons, were registered for the foreign trade. This tonnage constitutes only 4.2 per cent of the total product turned out by American shipyards in 1900, hardly equivalent to half a month's construction. Reports of the Commissioner of Navigation show further that during the ten years ending with 1900, 206,771 tons of vessels built in the United States were registered for the foreign trade, a total that is equal to only 30.1 per cent of the tonnage constructed in shipyards of the United States for all purposes in the year 1900; that is to say, in less than four months of 1900 as much tonnage was built in American shipyards for all trades as was built in those shipyards for foreign trade during the entire ten years ending with 1900.

Although the actual tonnage of different vessels, foreign and domestic, engaged in the foreign trade of the United States is not precisely known, estimates have been made by different commissioners of navigation which may serve as a basis for comparison. In the report of the Commissioner of Navigation for 1900 the tonnage necessary for the foreign carrying trade in 1899 is estimated at 3,571,284 gross tons of steam and 1,000,000 tons of sail, a total of 4,571,284 tons.[3] This is the lowest official estimate that has been made. The Commissioner of Navigation stated in 1890 that 6,500,000 tons would be required to carry 83 per cent of the foreign commerce of the United States at that time.[4] That would make the tonnage required for carrying the entire foreign commerce of the United States 7,831,325 tons. Since that time the value of our foreign commerce has increased 36 per cent. In view of these expert official estimates, it would be conservative to state that fully 5,000,000 tons of shipping are now required for the carriage of the entire foreign commerce. Toward supplying that need home shipyards, as we have seen, contributed only 29,069 tons during the census year of 1900, and only 206,771 tons during the entire ten years ending with 1900. At the rate of construction in 1900 one hundred and seventy-two years would elapse before enough tonnage would be built for the present needs of our foreign trade. The average life of a ship is commonly computed at ten years, taking into account losses, accidents, and deterioration. But allowing twenty years as the average life of a modern steel steamship, at the present rate of construction for foreign trade over eight years would elapse before enough ships would be constructed to provide for the average losses of one year. In Great Britain, in 1899, steel steamships to the number of 567 were constructed, the tonnage of which aggregated 1,341,425, while in the United States 123 steel steam vessels, aggregating 237,379 gross tons, were constructed for all kinds of trade, inland, coastwise, and foreign. As a matter of fact only one steel steam vessel, of 1,771 tons, was built in the United States during 1900 for the foreign trade.[5] On the Great Lakes alone vessels aggregating 111,241 gross tons were built in 1900, or 16.2 per cent of the total tonnage built during that year in the United States, while the tonnage built under register, as previously stated, constituted but 4.2 per cent of the total tonnage, or 26.1 per cent of that constructed for the traffic of the Great Lakes. In number of tons, the merchandise moved annually upon the Great Lakes approximates very closely to the merchandise annually imported into and exported from the United States, but the distance it is carried is very much less. For this reason the commerce of the Great Lakes can be carried by use of a tonnage approximately one-third as large as is necessary for the carriage of our foreign commerce. And yet, notwithstanding the smaller requirements of the traffic on the Great Lakes, the tonnage built for that traffic in 1900 was nearly four times that built for foreign trade.

While in general our laws deny American registry to foreign-built vessels, there are exceptions provided by which such vessels may be registered if owned by citizens of the United States. For instance, a foreign-built vessel wrecked in American waters and purchased and repaired by a citizen of the United States may be registered "if it shall be proved to the satisfaction of the Commissioner [of Navigation] that the repairs put upon such vessel are equal to three-fourths of the cost of the vessel when so repaired."[6] Congress also, by special enactment, admits foreign vessels to American registry from time to time, under exceptional circumstances. During the past ten years vessels of foreign

[1] Report Commissioner of Navigation, 1901, pages 560–563.
[2] Ibid., 1900, page 382.
[3] Ibid., page 24.
[4] Ibid., 1890, page 132.
[5] Report Commissioner of Navigation, 1900, pages 25–27.
[6] Navigation Laws of the United States, 1899, page 16.

construction, including Hawaiian tonnage and vessels captured from Spain, aggregating 134,859 tons, were admitted to American registry, a total equal to 65.2 per cent of the tonnage constructed in domestic shipyards for the foreign trade during the same period.[1]

In 1890 the American tonnage under register, in our foreign trade, amounted to 946,695 tons, since which time 206,771 tons have been built in the United States and documented under register, and 134,859 tons of foreign-built vessels have been granted American registry. This would have made a total of 1,288,325 tons in 1900, had none gone out of existence. But in 1900 the tonnage under American registry was only 826,694, showing a loss of 461,631 tons during the ten years. This shrinkage is more than twice as much as the total new registered tonnage built in the United States during the decade. This indicates how hopeless, under present conditions, are the prospects of the shipyards of the United States maintaining even the present tonnage in the foreign carrying trade, to say nothing of providing the additional tonnage made necessary by the growth in volume of foreign commerce. An idea of the extent of this growth may be obtained from a study of the statistics of tonnage of foreign commerce entering at and clearing from the seaports of the United States in 1890 and 1900. In 1890 the tonnage of American and foreign vessels entering the seaports of the United States from foreign ports was 15,365,604 tons; in 1900 it was 23,533,597 tons, an increase of 8,167,993 tons, or 53.2 per cent, in ten years. The tonnage of clearances in foreign trade is approximately that of entries, and consequently shows about the same percentage of increase.[2]

The domestic water-borne traffic of the United States is confined to vessels constructed and owned in the United States, and the growth of shipping in the domestic trade seems to be all that can be desired. The improvement of rivers and harbors has, during the last decade especially, proceeded upon an enormous scale, with promise of continuance. These improvements make possible the use of craft of constantly increasing size; and freight rates being gradually decreased, the effect is inevitably stimulating upon the growth of domestic water-borne commerce. This growth assures to shipbuilders of the United States a steady demand for vessels adapted to the needs of domestic traffic.

The recent territorial acquisitions of the United States, extending to the West Indies and the islands of the Pacific, our trade with which must be confined to vessels built in the United States, holds promise to shipbuilders of a demand for ocean-going vessels adapted to the trade requirements and harbor facilities of the ports of these possessions. Moreover, it is likely that the future growth of the Navy will afford employment for many shipyards. Its growth during the past twenty years accounts, in very large degree, for the establishment of new and entirely up-to-date plants and the reequipment of old plants with the modern facilities required for the construction of high-class naval vessels. These establishments are also prepared to enter upon the construction of vessels of any size or type for any trade; and the grade of work and fineness of finish demanded by the specifications for our war ships, and insured by the thorough inspection under which they are built, are likewise evinced in the improvements shown in the constructions for our merchant service. The demand for yachts, steam and sail, of the finest and largest type, the finish and elegance of which are so notable, gives employment to men of the greatest efficiency in a number of our shipyards in different parts of the country.

These are the varied demands upon our shipbuilders that form the broad underlying foundation of their present prosperous condition. But the constructions for the foreign trade of the United States, which afford, in other countries, investment for a capital probably twice as large as is at present invested in the United States, furnishing employment to thousands of skilled workmen and providing an enormous market for materials, assume very small proportions in the shipyards of our own country. The demand for vessels in the foreign trade is so great that if it were supplied by American shipyards the average annual construction of these yards would be increased fully one-third in tonnage and probably doubled in value. The types of vessels engaged in the foreign trade are much more costly than those employed in domestic trade. Summing up the present situation, the paradox exists of a substantial number of establishments, equipped with every essential for the construction of ocean-going ships of every type, being limited to the construction of war ships and of vessels for our domestic trade, except for the infrequent and spasmodic requirements of a few courageous shipowners who persist in operating American-built ships in foreign trade. The very infrequency and uncertainty of this demand largely account for the fact that the cost of construction per ton is higher in the United States than in other countries, notably Great Britain, which probably builds four-fifths of the world's ocean-going tonnage, although less than three-fifths of it is under the flag of that nation. This anomalous condition of American shipyards, in respect of equipment for and output of ocean-going shipping, has attracted widespread attention and provoked world-wide comment. Precisely what should be done to increase United States shipping in foreign trade is the much discussed and still unsolved American maritime problem.

As previously stated, 206,771 tons of ships for foreign trade were built in the United States during the past decade. During the same period 12,077,359 tons of steel steamships were built in the world's shipyards,

[1] Reports of the Commissioner of Navigation, 1891 to 1900, inclusive; table giving "Balance sheets of tonnage accounts."

[2] Statistical Abstract of the United States, 1900, pages 441–442.

of which Great Britain built 9,793,426 tons, or 81.1 per cent. In the United States only 742,830 tons of steel vessels were built during the past ten years, 450,089 tons of which were constructed upon the Great Lakes. The remainder, 292,741 tons, or 39.4 per cent of the total, represents the constructions of the Atlantic and Pacific shipyards for the coastwise and ocean traffic.[1] It should be stated in this connection that during the last three years of the decade 80,687 tons of American vessels were sold to the Government, as compared with a total of 4,254 tons sold during the intervening years succeeding the Civil War. This, naturally, created an abnormal demand for new tonnage, which is shown by the fact that of the 275,550 tons of steel vessels built on the Atlantic coast of the United States during the past decade, 138,888 tons, or more than one-half, were constructed in the last three years of that period, and 70,548, or more than one-fourth, in the year 1900. Since, however, 8,258 tons were bought back, the net purchases amounted to 72,429 tons.[2] It is very easy to see, in the light of these large purchases, comprising in most cases vessels of the largest and most serviceable type for the needs of the Government, what an abnormal demand for construction has arisen, leading to an unparalleled degree of activity in our shipyards. The acquirement of Porto Rico and Hawaii, and the restriction of that trade to American-built vessels, has also added to the demand for large vessels, in the construction of which a few of our shipyards are now engaged. The total documented tonnage annually lost, abandoned, sold, and exempted is quite large, the amount in the year 1900 being 156,862 tons. During the last decade 1,897,488 tons have been so withdrawn, an annual average of 189,748 tons. The documented tonnage of the United States in 1900 constituted only 57.3 per cent of the tonnage constructed in the shipyards of the United States during that year, as disclosed by the census returns. The undocumented tonnage consists of a class of shipping which is much lighter, more frail, and more short-lived, so that it is reasonable to believe that the annual loss in this tonnage fully equals that in the documented. Therefore, there is an annual demand, merely to make good average losses, for new tonnage aggregating between 300,000 and 350,000 tons, so that losses alone in our national shipping create a steady demand for what may be regarded as a substantial annual total of new tonnage—more than one-half, probably, of the tonnage constructed during the year 1900.

Although iron ships were constructed in American shipyards previous to the inauguration of the new Navy, which were almost wholly employed in domestic trade, modern steel shipbuilding is contemporaneous with the growth of the new Navy, the first vessels for which were launched about sixteen years ago. These initial constructions led to the equipment of a few of the shipbuilding establishments in operation at that time with plants adequate for the production of modern ships of war, and these plants, with others that have been established since, are equally capable of producing steel merchant vessels of the highest type, a limited number of which, in every way a credit to the skill of the shipbuilders, have been turned out during the last decade.

Table 1 shows the statistics for the entire industry, exclusive of establishments owned by the Government, as returned at the censuses of 1850 to 1900, inclusive, with the percentage of increase for each decade.

[1] Report Commissioner of Navigation, 1900, page 24.
[2] Ibid., page 439.

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	1,116	1,006	2,188	964	675	953	10.9	[1]54.0	127.0	42.8	[1]29.2
Capital	$77,362,701	$27,262,892	$20,979,874	$11,463,076	$5,952,665	$5,373,139	183.8	29.9	83.0	92.6	10.8
Salaried officials, clerks, etc., number	1,407	[2]21,123	([3])	([3])	([3])	([3])	25.3	.....	.....	.....	.....
Salaries	$2,008,537	[2]$1,194,870	([3])	([3])	([3])	([3])	68.1	.....	.....	.....	.....
Wage-earners, average number	46,781	22,143	21,345	13,915	10,071	12,976	111.3	3.7	53.4	38.2	[1]22.3
Total wages	$24,839,163	$13,083,949	$12,713,813	$7,073,400	$4,539,313	$6,055,884	89.9	2.9	79.7	55.8	[1]25.0
Men, 16 years and over	45,744	21,960	21,338	13,814	10,070	12,962	108.3	2.9	54.5	37.2	[1]15.3
Wages	$24,636,612	$13,055,083	([3])	([3])	([3])	([3])	88.7	.....	.....	.....	.....
Women, 16 years and over	34	9	.....	6	1	14	277.8	.....	[1]100.0	500.0	[1]92.9
Wages	$11,424	$2,522	.....	([3])	([3])	([3])	353.0	.....	.....	.....	.....
Children, under 16 years	1,003	174	7	95	([3])	([3])	476.4	2,385.7	[1]92.6	.....	.....
Wages	$191,127	$26,344	([3])	([3])	([3])	([3])	625.5	.....	.....	.....	.....
Miscellaneous expenses	$3,685,661	$1,392,551	([4])	([4])	([4])	([4])	164.7	.....	.....	.....	.....
Cost of materials used	$33,486,772	$16,521,246	$19,736,358	$9,379,980	$5,788,676	$7,420,496	102.7	[1]16.3	110.4	62.0	[1]22.0
Value of products, including repairing	$74,578,158	$38,065,410	$36,800,327	$21,488,967	$13,424,037	$16,937,525	95.9	3.4	71.3	60.0	[1]20.7

[1] Decrease.
[2] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Tables 21 and 22.)
[3] Not reported separately.
[4] Not reported.

Table 1 includes returns from a large number of small establishments engaged in the building or repairing of canal boats, ships' boats, fishing boats, pleasure boats, and other small craft, as well as in the construction of masts and spars. It is possible that the canvass for the collection of returns for these small establishments has been more thorough at some censuses than at others.

In some of the great shipbuilding establishments the manufactures of a character different from shipbuilding are too important to be included as by-products of that industry. In such cases the method was adopted of

treating each of the establishments as two separate plants, including in the tables presented in this report the operations in shipbuilding, with value of products and cost of labor and materials, and assigning to this branch of the work a certain proportion of the officers, clerks, etc., employed in the establishment. All other products of the establishments, with the materials, wages, and salaries chargeable thereto, were included under their proper classified industries. There are 3 such establishments in Delaware, 1 in Maryland, and 1 in Washington.

On the other hand a certain amount of vessel construction and repair work is carried on in the United States by establishments which, so far as their main business is concerned, are not shipbuilding plants. The construction of stationary engines, machinery, and steel work of a general character so largely predominates in their output that it is not practicable to include them in the shipbuilding tables. Of the more important establishments of this class, one is located in Pennsylvania, classified under "foundries and machine shops," whose total product in marine construction during 1900 was $54,990. This value included a wooden steam vessel of 200 gross tons, valued at $25,675. An establishment in Michigan, similarly classified, built 4 wooden steam vessels aggregating 202 gross tons measurement and $23,100 in value. An establishment in Maryland did general marine repair work valued at $15,000.

The report on shipbuilding at the census of 1890 contained the following statement: "Returns too imperfect for tabulation were received from a few shipbuilders. It is believed that the omission of reports from the delinquent establishments has but slight effect on the totals for the United States. The principal omissions occur in the state of Pennsylvania." In the light of the information at that time in the possession of those tabulating the returns for shipbuilding for the Eleventh Census, the statement seemed to adequately qualify the statistical results. Certain not wholly explainable omissions of considerable magnitude, however, indicate that the deficiencies may have been more serious than was supposed, and that caution must be exercised in making comparisons between the census returns of 1890 and those of 1900. Taking the governmental establishments as an illustration, 9 were reported in 1900, while but 4 were reported in 1890, and yet the fact is that 7 of the establishments reported in 1900 were in existence in 1890. It is possible that the omission of 3 of these establishments from the 1890 report was due to the small amount of repairing on ships, which led to their inclusion in the foundry and machine shop classification. Moreover, but 18 private iron and steel shipbuilding establishments were reported at the census of 1890, although the schedules for 1900 show that of the 44 iron and steel shipbuilding establishments then reporting, all but 6, according to the statements of the officers or proprietors, had been established before 1890. These seeming omissions may, in part, be explained upon the theory that establishments engaged in building wooden vessels at the census of 1890 have since entered upon the construction of iron and steel vessels, as the schedules show only the date that the establishments commenced operations, no information in regard to the change in the character of its products being required.

Table 1 shows that the number of establishments engaged in the building and repairing of vessels, boats, masts, and spars increased from 953 in 1850 to 1,116 in 1900, or 17.1 per cent, while the capital invested increased from $5,373,139 to $77,362,701, or 1,339.8 per cent. This is an increase in the average capital per establishment invested in the industry, from $5,638 in 1850 to $69,321 in 1900, or 1,129.5 per cent. During the same period the average number of wage-earners increased from 12,976 to 46,781, or 260.5 per cent. The total value of constructions and repairs increased from $16,937,525 to $74,578,158, or 340.3 per cent. Of the latter sum a large part represents work done for the Navy and War Departments. It was found impracticable to secure any statement from these departments covering the census year ending May 31; but it appears that during the year ending June 30, 1900, the sum of $8,554,862 was disbursed in the Navy Department to private shipbuilding establishments for construction and repairs, and the sum of $5,493,556 in the War Department, the total being $14,048,438, or 18.8 per cent of the total value of products reported by private shipyards for the census year. Of the amount disbursed in the War Department, $1,291,581 was for "fitting up chartered transports," the remainder being expended "for refitting and repairs of vessels owned by the War Department."

Table 1 shows that the capital invested in shipbuilding in 1850 and 1860 was less than $6,000,000, a sum insufficient to replace any one of several existing iron and steel establishments. The value of the products in 1850 was more than three times greater than the capital invested, and in 1860 was more than twice as great. In 1900, for the first time in the census history of the industry, the value of products was less than the capital invested. The ratio of capital to product has steadily increased from 1850 to the present time. In 1850 the wages paid to labor exceeded the capital, but in 1900 was less than one-third the amount invested.

Table 2 presents the statistics for the industry by establishments manufacturing a product exceeding $500 in value, separated into those of iron and steel shipbuilding and wooden shipbuilding, by governmental establishments, and by establishments with a product of less than $500. These two latter classes of establishments are omitted from all the other tables, except Tables 3 and 22, which present comparative and detailed statistics, respectively, for governmental establishments. In addition to the 1,229 active establishments in the industry during the census year, with a capital of $131,736,843, shown in Table 2, there were 3 idle iron and steel shipbuilding establishments, with a total capital of $2,688,940.

TABLE 2.—SUMMARY FOR ALL ESTABLISHMENTS.

CLASSES.	Number of establishments.	Capital.	Proprietors and firm members.	WAGE-EARNERS.		Miscellaneous expenses.	COST OF MATERIALS USED.			Value of products, including repairing.
				Average number.	Total wages.		Total.	Principal materials.	Fuel, freight, etc.	
Total	1,229	$131,736,843	1,366	54,477	$31,063,176	$3,718,836	$37,303,618	$35,743,967	$1,559,651	$85,642,540
Iron and steel shipbuilding	44	59,389,555	16	30,906	16,231,311	2,642,690	23,585,549	22,447,481	1,138,068	50,367,739
Wooden ship and boat building	1,072	17,523,146	1,239	15,875	8,607,852	1,042,971	9,901,223	9,638,159	263,064	24,210,419
Governmental establishments	9	54,291,011	.....	7,690	6,222,263	29,064	3,805,326	3,647,155	158,171	11,034,312
Establishments with a product of less than $500	104	83,131	111	6	1,750	4,111	11,520	11,172	348	30,070

Table 3 presents a comparative summary of the statistics reported by governmental establishments at the censuses of 1890 and 1900, with the percentages of increase for the decade.

TABLE 3.—COMPARATIVE SUMMARY, GOVERNMENTAL ESTABLISHMENTS, 1890 AND 1900, WITH PER CENT OF INCREASE.

	1900	1890	Per cent of increase.
Number of establishments	9	4	125.0
Capital	$54,291,011	$26,130,182	107.8
Salaried officials, clerks, etc., number	540	.....	.....
Salaries	$466,497	.....	.....
Wage-earners, average number	7,690	2,668	188.2
Total wages	$6,222,263	$1,750,028	255.5
Men, 16 years and over	7,664	[1]	.....
Wages	$6,202,882	[1]	.....
Women, 16 years and over	25	[1]	.....
Wages	$19,281	[1]	.....
Children, under 16 years	1	[1]	.....
Wages	$100	[1]	.....
Miscellaneous expenses	$29,064	.....	.....
Cost of materials used	$3,805,326	$403,863	842.2
Value of products, including repairing	$11,034,312	$2,276,705	384.7
Vessels:			
Number	.....	13	.....
Tonnage	.....	24,956	.....
Value	.....	$1,705,857	.....
Boats:			
Number	[2] 679	50	1,258.0
Value	[2] $115,322	$50,000	130.6
Masts and spars:			
Value	[1]	$20,000	.....
Repairs:			
Value	$6,470,238	$500,848	1,191.9

[1] Not reported separately. [2] Includes 2 barges, valued at $1,200.

Table 3 shows a large increase in the statistics of governmental establishments engaged in shipbuilding and repairs. In this connection, the fact that several establishments which are included for 1900 were probably entered under some other classification in 1890 should be taken into account. As previously stated, 7 of the yards reported as governmental shipyards were in existence and engaged in similar work in 1890, although 4 only appear in the report for that year. The establishments whose reports compose Table 3 are the governmental navy-yards located at Kittery, Me., Boston (Charlestown), Mass., Brooklyn, N. Y., Philadelphia (League Island), Pa., Norfolk, Va., Port Royal, S. C., Vallejo (Mare Island), Cal., and Bremerton (Puget Sound), Wash., and an establishment under the supervision of the state of Illinois, engaged in the repair of canal boats, locks, gates, etc., at Lockport, Ill. Table 3 includes the reports of all United States navy-yards, except that at Washington, D. C., at which yard a very large proportion of the work done was the manufacture of ordnance, and the report was classified accordingly, and the naval station at Pensacola, Fla., where a small amount of repair work was done, a return of which was not received.

The work performed at several of the navy-yards consisted of the repair of naval vessels and the manufacture of ships' boats, small boats, barges, etc.; the building and repair of machinery, and the ordnance and other equipment of the vessels. It was impossible to make separate reports of each class of work. The figures presented in Table 2 include, therefore, statistics that do not pertain strictly to shipbuilding or repairing. The table shows that in 1890 there were constructed 13 vessels, valued at $1,705,857, with a total tonnage of 24,956. The reports show no work of this character in 1900. There were 50 boats made in 1890, valued at $50,000, as compared with 679 in 1900, valued at $115,322. The figures for 1900 include 2 barges, valued at $1,200, made at the Port Royal, S. C., yard, the only new constructional work reported, with the exception of boat building. The figures for 1900 show that almost the entire work consisted of repairing, equipment, etc. In 1890, 74.9 per cent of the value of the work was new construction, while in 1900, of the $11,034,312 reported as the value of the products, $10,916,990, or 98.9 per cent, was the value of repair work and equipment. In 1890 the tonnage of new vessels built in Government yards was 24,956, valued at $1,705,857, an average of $68 per ton, which precludes the possibility of such tonnage being warships. The value of the product as reported by governmental establishments for 1899 was $8,061,093, which was an increase of 254.1 per cent over 1890. The increase indicated by the figures for 1900 over 1899 was 36.9 per cent.

The large capital invested in governmental shipbuilding establishments indicates the costliness of such modern equipment, and explains, in a measure, the enormous investment necessary in private yards to enable them to successfully engage in the construction of modern ships of war. The average capital invested in the 8 navy-yards is $6,785,064. This exceeds the total capital invested in shipbuilding in the United States in 1850 by $1,411,925.

Table 4 presents the comparative statistics for iron and steel shipbuilding for 1890 and 1900.

TABLE 4.—COMPARATIVE SUMMARY, IRON AND STEEL SHIPBUILDING, 1890 AND 1900, WITH PER CENT OF INCREASE.

	1900	1890	Per cent of increase.
Number of establishments	44	18	144.4
Capital	$59,839,555	$10,712,023	458.6
Salaried officials, clerks, etc., number	857	[1]138	521.0
Salaries	$1,411,863	[1]$291,105	485.0
Wage-earners, average number	30,906	8,165	278.5
Total wages	$16,231,311	$4,883,665	232.4
Men, 16 years and over	29,940	[2]	.....
Wages	$16,045,494	[2]	.....
Women, 16 years and over	17	[2]	.....
Wages	$4,908	[2]	.....
Children, under 16 years	949	[2]	.....
Wages	$180,909	[2]	.....
Miscellaneous expenses	$2,642,690	$546,135	383.9
Cost of materials used	$23,585,549	$6,256,905	277.0
Value of products, including repairing	$50,367,739	$13,012,266	287.1
Vessels:			
Number	134	88	52.3
Tonnage—			
Gross	262,516	[3]123,973	111.8
Net	186,509	.....	.....
Value	$25,454,943	$11,550,846	120.4

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 21.)
[2] Not reported separately.
[3] Kind of tonnage not specified in 1890.

Table 4 discloses a remarkable growth in the number of establishments, capital invested, wage-earners employed, wages paid, cost of materials, and value of products. The statistics indicate not only that this branch of the industry increased largely in all the essential items of information, but that the individual establishments have enlarged their productive capacity by investments in improved machinery equipment, and by extensions of their plants. The capital per establishment in 1890 averaged $595,112, and in 1900, $1,359,990, an increase of 128.5 per cent. The average number of wage-earners to each establishment in 1890 was 454; in 1900 it was 702, an increase of 54.6 per cent. The average value of product per establishment in 1890 was $722,904; in 1900 it was $1,144,721, an increase in value per establishment of 58.4 per cent. The value of the new iron and steel vessels constructed in 1890 was 88.8 per cent of the total value of the products; in 1900 only 50.5 per cent of the product was represented in new construction. The increase in the value of the products in this branch of the industry in 1900 over 1890 was 287.1 per cent, yet the number of vessels constructed increased only from 88 to 134, or 52.3 per cent. The value of the new construction was 120.4 per cent greater in 1900 than in 1890.

The new tonnage constructed in the iron and steel branch of the industry in 1890 was 123,973, but whether gross or net is unknown. In view of this uncertainty, but little value can be attached to any comparative deductions as to the value of iron and steel vessels per ton in 1900 as compared with 1890. Assuming that the tonnage statistics for the census of 1890 were for gross measurement, the value per ton was $93.17, while it is shown that the value in 1900 was $96.97 per gross ton of the iron and steel vessels constructed. In view of the great reduction in the cost of iron and steel during the past ten years, it is not reasonable to suppose that there has been an actual increase in the cost per ton of vessels constructed from these materials; on the contrary, there has been a substantial decline. It is believed that in some cases gross and in others net tonnage was reported in 1890, without any distinction.

The increase in capital invested in the iron and steel branch of the industry, for the decade ending with 1900, was $49,127,532, or 458.6 per cent. The capital in the whole industry increased only $50,099,809, or 183.8 per cent, which indicates what an insignificant increase was made in this respect in the wooden-shipbuilding branch. The increase in the value of shipbuilding products in both branches of the industry from 1890 to 1900 was $36,512,748, or 95.9 per cent. The increase in the value of iron and steel shipbuilding products alone was $37,355,473. Wooden shipbuilding, therefore, suffered an actual decrease.

Table 5 presents the comparative statistics for wooden shipbuilding for 1890 and 1900.

TABLE 5.—COMPARATIVE SUMMARY, WOODEN SHIP AND BOAT BUILDING, 1890 AND 1900, WITH PER CENT OF INCREASE.

	1900	1890	Per cent of increase.
Number of establishments	1,072	988	8.5
Capital	$17,523,146	$16,550,869	5.9
Salaried officials, clerks, etc., number	550	[1]985	[2]44.2
Salaries	$596,674	[1]$903,765	[2]34.0
Wage-earners, average number	15,875	14,116	12.4
Total wages	$8,607,852	$8,491,389	1.4
Men, 16 years and over	15,804	[3]	.....
Wages	$8,591,118	[3]	.....
Women, 16 years and over	17	[3]	.....
Wages	$6,516	[3]	.....
Children, under 16 years	54	[3]	.....
Wages	$10,218	[3]	.....
Miscellaneous expenses	$1,042,971	$846,416	23.2
Cost of materials used	$9,901,223	$10,264,341	[2]3.5
Value of products, including repairing	$24,210,419	$25,053,144	[2]3.4
Vessels:			
Number	1,953	1,265	54.3
Tonnage—			
Gross	425,165	[4]360,667	17.9
Net	356,330	.....	.....
Value	$10,300,971	$12,933,149	[2]20.4
Small boats:			
Number	15,448	18,689	[2]17.3
Value	$1,972,825	$1,392,084	14.2

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 22.)
[2] Decrease.
[3] Not reported separately.
[4] Kind of tonnage not specified in 1890.

The statistics presented in Table 5 include not only wooden shipbuilding and repairing, but also the manufacture of boats, oars, masts, and spars. Subsidiary tables, presented elsewhere in this report, will show what part these minor or auxiliary industries form of the whole.

Several items in the foregoing table show a decrease. While there has been an increase during the decade of 8.5 per cent in the number of establishments and 5.9 per cent in the capital, there has been a decrease of 435, or 44.2 per cent, in the number of salaried officials, clerks, etc., and of $307,091, or 33.9 per cent, in the salaries paid, with comparatively slight increases in the number

of wage-earners and in wages paid. The decrease in cost of materials was $363,118, or 3.5 per cent, and in value of products it was $842,725, or 3.4 per cent. While the number of vessels built increased 687, or 54.3 per cent, their value decreased $2,632,178, or 20.4 per cent, showing that the use of wood in shipbuilding is being restricted to smaller vessels than formerly. It is impracticable, however, to make reliable comparisons between the tonnage of wooden vessels built in 1900 and in 1890, for the same reason as in the iron and steel branch of the industry, that the tonnage at the former census was reported in one item, no distinction being made between gross and net. Assuming, however, that gross tonnage was reported, the average tonnage per vessel was 285 in 1890, compared with 218 in 1900. In the latter year the value of wooden construction was $24.23 per gross ton or $28.91 per net ton.

Table 6 is a comparative summary by states of the totals for the shipbuilding industry in the census years 1890 and 1900.

TABLE 6.—COMPARATIVE SUMMARY, BY STATES: 1890 AND 1900.

STATES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including repairing.
				Number.	Salaries.	Average number.	Total wages.			
United States	1900	1,116	$77,362,701	1,407	$2,008,537	46,781	$24,889,163	$3,685,661	$33,486,772	$74,578,158
	1890	1,006	27,262,892	[1]1,123	[1]1,194,870	22,143	13,083,949	1,392,551	16,521,246	38,065,410
Alabama	1900	6	146,946	3	4,300	293	101,526	6,022	76,767	240,242
	1890	5	37,750	3	750	82	24,324	1,085	9,493	38,701
California	1900	41	5,776,518	97	147,948	3,549	2,289,694	518,200	3,234,804	6,736,636
	1890	32	1,953,198	15	60,146	1,467	1,153,843	378,104	1,212,671	3,148,683
Connecticut	1900	35	601,871	12	14,012	915	451,086	13,529	680,213	1,227,120
	1890	29	564,941	28	27,904	624	348,218	20,463	535,093	1,058,301
Delaware	1900	11	2,226,811	97	124,010	2,031	992,449	122,267	1,594,918	3,004,366
	1890	11	1,745,213	43	98,174	1,759	800,977	69,819	886,979	2,044,818
District of Columbia	1900	3	14,465	.....	.....	17	11,480	154	6,989	24,980
	1890	4	15,575	.....	.....	14	8,410	654	9,940	28,755
Florida	1900	16	284,159	14	15,250	327	125,509	16,385	167,461	409,991
	1890	16	93,156	7	3,740	69	29,881	2,083	21,702	68,020
Georgia	1900	4	15,170	2	1,400	19	5,156	680	12,650	23,500
	1890	4	156,100	6	6,080	112	55,054	9,384	45,716	126,300
Illinois	1900	18	1,972,220	33	83,559	1,359	670,658	53,751	952,960	2,331,659
	1890	10	638,439	16	15,155	315	171,866	11,723	148,127	421,815
Indiana	1900	15	430,907	18	58,620	403	189,179	42,461	296,143	675,207
	1890	11	371,860	8	6,794	543	246,939	7,722	204,229	551,640
Iowa	1900	11	69,996	12	11,900	214	79,460	55,417	60,578	291,025
	1890	5	38,850	3	1,825	45	25,101	3,997	22,820	73,144
Kentucky	1900	10	60,377	6	3,785	104	48,090	7,804	20,775	97,492
	1890	29	53,511	26	15,612	62	25,965	3,157	31,675	95,545
Louisiana	1900	15	212,643	23	15,232	247	105,196	9,732	71,621	250,307
	1890	13	368,218	17	15,104	175	104,451	13,227	71,259	229,645
Maine	1900	117	2,819,053	54	57,938	2,216	1,219,657	109,572	2,022,557	3,777,059
	1890	85	1,027,756	89	65,721	1,450	777,994	109,032	1,423,175	2,818,565
Maryland	1900	47	4,446,028	95	105,442	2,615	1,517,705	141,565	1,798,564	4,161,525
	1890	34	1,315,262	32	28,859	1,048	620,483	92,677	737,457	1,737,674
Massachusetts	1900	125	2,149,291	80	79,046	1,606	1,035,993	231,769	1,357,405	3,057,454
	1890	147	1,289,998	112	96,961	1,076	768,967	71,604	890,405	2,248,647
Michigan	1900	54	3,893,019	78	76,388	2,916	1,343,887	209,555	2,197,883	4,482,101
	1890	62	3,266,472	93	81,901	2,191	1,185,201	97,736	2,300,299	4,710,108
Minnesota	1900	25	161,967	7	7,580	137	74,317	11,401	84,962	223,971
	1890	20	521,373	11	9,924	308	168,684	2,570	322,412	542,440
Mississippi	1900	13	54,885	5	4,500	78	46,452	1,829	46,376	115,744
	1890	9	8,554	2	764	45	14,978	157	7,495	26,425
Missouri	1900	10	25,930	3	3,070	66	45,909	6,342	31,914	93,367
	1890	5	125,025	11	11,381	346	147,813	18,067	145,707	417,236
New Hampshire	1900	6	10,585	.....	.....	5	3,600	368	2,625	9,793
	1890	.....	.....	.....	.....	.....	.....	.....	.....	.....
New Jersey	1900	68	3,686,382	123	158,027	2,874	1,792,209	368,027	1,949,519	4,810,470
	1890	62	2,165,104	70	73,499	1,116	817,290	89,200	1,140,452	2,592,420
New York	1900	227	9,675,080	197	265,349	5,572	3,181,959	309,415	3,115,997	8,647,371
	1890	216	4,281,884	235	278,245	3,303	2,337,511	166,442	2,267,391	6,154,488
North Carolina	1900	14	73,760	2	1,200	73	34,782	2,504	21,253	77,528
	1890	16	76,978	12	8,496	126	41,988	3,423	30,896	101,615
Ohio	1900	33	5,155,440	68	125,545	3,117	1,650,775	218,305	1,286,450	3,614,714
	1890	44	2,950,811	143	128 967	2,679	1,892,245	86,986	1,750,939	3,804,888
Oregon	1900	17	592,564	28	39,590	687	361,357	46,641	628,189	1,287,385
	1890	14	305,220	9	7,597	199	127,625	9,508	119,036	320,715

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Tables 21 and 22.)

TABLE 6.—COMPARATIVE SUMMARY, BY STATES: 1890 AND 1900—Continued.

STATES.	Year.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including repairing.
				Number.	Salaries.	Average number.	Total wages.			
Pennsylvania	1900	38	$14,141,482	161	$253,901	7,077	$3,544,945	$630,163	$7,173,201	$14,493,158
	1890	32	2,443,063	47	76,096	1,975	1,139,780	82,941	1,759,582	3,239,770
Rhode Island	1900	21	700,847	28	45,534	762	441,358	189,217	470,163	1,234,333
	1890	15	316,665	16	15,980	184	117,473	5,271	68,900	239,626
South Carolina	[1]1900									
	1890	8	128,020	7	6,360	76	40,926	11,554	46,752	186,130
Tennessee	1900	3	1,020			11	2,560	30	3,710	8,097
	[1]1890									
Texas	1900	7	10,930			38	19,815	1,150	90,845	126,446
	1890	9	9,619	2	918	29	10,870	425	12,808	29,777
Vermont	[1]1900									
	1890	3	8,950	2	312	12	4,260	158	2,859	8,289
Virginia	1900	29	14,824,884	93	228,261	5,569	2,525,121	224,144	2,943,317	6,162,962
	1890	17	310,726	15	9,988	194	89,706	4,436	83,694	297,000
Washington	1900	37	766,909	33	38,014	842	568,985	51,763	802,529	1,723,476
	1890	17	155,620	15	12,711	171	84,505	5,037	68,885	188,685
West Virginia	1900	4	46,455	4	1,575	53	20,204	1,780	19,354	51,170
	1890	4	21,303	2	700	55	16,850	2,307	8,252	38,980
Wisconsin	1900	30	2,273,952	36	37,561	935	360,380	33,012	307,639	1,091,372
	1890	16	544,828	26	28,206	285	176,799	11,157	178,351	463,120
All other states	[2]1900	6	40,210			64	27,710	698	11,441	66,137
	[3]1890	2	2,250			13	6,942	450	6,295	19,000

[1] Included in "all other states."
[2] Includes states having less than 3 establishments, distributed as follows: Arkansas, 1; Idaho, 1; South Carolina, 2; Vermont, 2.
[3] Includes states having less than 3 establishments, distributed as follows: Arkansas, 1; Tennessee, 1.

Table 6 shows the totals for the industry for 1900 in 33 states, of which the following 17 reported either a capital or products of more than $1,000,000 each: California, Connecticut, Delaware, Illinois, Maine, Maryland, Massachusetts, Michigan, New Jersey, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Virginia, Washington, and Wisconsin. Of these states, 3 are located on the Pacific coast, 4 on the Great Lakes, and 10 on the Atlantic, although both New York and Pennsylvania have ports on the Great Lakes. All of the above states show gratifying increases, with the exception of Michigan and Ohio, which show decreases in cost of materials and value of products. The percentages of increase or decrease during the decade for the foregoing states, in capital, wages paid, cost of materials used, and value of products, are shown in the following statement:

STATES.	PERCENTAGE OF INCREASE.			
	Capital.	Wages.	Cost of materials used.	Value of products.
California	195.8	94.1	166.7	114.0
Connecticut	6.5	29.5	27.1	16.5
Delaware	27.6	23.9	90.5	47.0
Illinois	208.9	290.2	543.3	452.8
Maine	174.3	56.8	42.1	34.0
Maryland	288.0	144.6	143.9	139.5
Massachusetts	73.3	34.7	52.4	36.0
Michigan	19.2	13.4	[1]4.5	[1]5.9
New Jersey	70.3	119.3	70.9	85.6
New York	126.0	36.1	37.4	40.5
Ohio	74.7	18.6	[1]29.4	[1]5.0
Oregon	94.1	183.1	423.5	301.4
Pennsylvania	478.8	211.0	307.7	347.4
Rhode Island	121.3	275.7	582.4	415.2
Virginia	4,671.0	2,715.0	3,416.8	1,975.1
Washington	392.8	573.3	1,065.1	813.4
Wisconsin	317.4	103.8	72.5	135.7

[1] Decrease.

Of the states included in the above statement, notable advances have been made in Virginia, Pennsylvania, Illinois, Maryland, California, Washington, Oregon, and New Jersey.

During the last decade Virginia has advanced from a position of comparatively small importance to a place among the leading shipbuilding states. In 1900 this state was first in the amount of capital invested, third in the number of wage-earners and in wages paid, and fourth in the value of products. Its capital invested in shipbuilding has increased from less than a third of a million in 1890 to nearly fifteen millions in 1900, and is two and one-third times as great as the entire capital invested in the industry in New England, more than double the entire capital so invested on the Pacific coast, and almost equal to the entire amount of capital invested in shipbuilding on the Great Lakes. When the prolific development in the shipbuilding industry upon the Great Lakes—a development that has challenged the attention of the entire shipbuilding world for more than a decade—is taken into consideration, this comparison seems to indicate the future development and importance of Virginia as a great shipbuilding center.

The amount of capital invested in shipbuilding in Illinois was 208.9 per cent greater in 1900 than in 1890, the number of wage-earners increased 331.4 per cent, and the wages 290.2 per cent; the increase in the cost of materials used was 543.3 per cent and in the value of products 452.8 per cent.

In California the capital increased 195.8 per cent in 1900 over 1890, the number of wage-earners 141.9 per cent, the total amount of wages paid 94.1 per cent, the

cost of materials used 166.7 per cent, and the value of products 114 per cent.

In Delaware the capital showed an increase for 1900 over 1890 of 27.6 per cent, number of wage-earners 15.5 per cent, wages paid 23.9 per cent, cost of materials used 90.5 per cent, and value of products 47 per cent.

In Maine the capital increased during the decade 174.3 per cent, the number of wage-earners 52.8 per cent, wages paid 56.8 per cent, cost of materials used 42.1 per cent, and value of products 34 per cent.

In Maryland the capital increased 238 per cent, the number of wage-earners 150.7 per cent, wages paid 144.6 per cent, cost of materials used 143.9 per cent, and value of products 139.5 per cent.

In Massachusetts the capital increased 73.3 per cent, the number of wage-earners 49.3 per cent, wages paid 34.7 per cent, cost of materials used 52.4 per cent, and value of products 36 per cent.

In Michigan the capital increased 19.2 per cent, the number of wage-earners 33.1 per cent, and wages paid 13.4 per cent; the cost of materials used and value of products decreased 4.5 per cent and 5.9 per cent, respectively.

In New Jersey the capital invested increased 70.3 per cent, the number of wage-earners 157.5 per cent, wages paid 119.3 per cent, cost of materials used 70.9 per cent, and value of products 85.6 per cent.

In New York there was an increase of 126 per cent in capital invested, 68.7 per cent in the number of wage-earners, 36.1 per cent in wages paid, 37.4 per cent in cost of materials, and 40.5 per cent in value of products. New York ranks third in the amount of capital invested in shipbuilding, second in the number of wage-earners and amount of wages paid, third in the cost of materials used, and second in the value of products. There were employed in this state only three more wage-earners than, during the same year, in Virginia. The amount of wages paid, however, in the former state exceeded that in the latter by $656,838.

In Ohio the capital increased 74.7 per cent, number of wage-earners 16.3 per cent, and wages paid 18.6 per cent; the cost of materials used and value of products decreased 29.4 per cent and 5 per cent, respectively. It is a singular fact that there should be so large an increase in the amount of capital invested in shipbuilding in this state coincident with a decrease in the value of the products between 1890 and 1900.

In Pennsylvania there was an increase of 478.8 per cent in capital invested, 258.3 per cent in the number of wage-earners, 211 per cent in wages, 307.7 per cent in the cost of materials used, and 347.4 per cent in the value of products.

In Virginia there was an increase of 4,671 per cent in the capital invested in 1900 over 1890, 2,770.6 per cent in the number of wage-earners, 2,715 per cent in wages paid, 3,416.8 per cent in the cost of materials used, and 1,975.1 per cent in the value of products.

For the reason previously pointed out, that an omission of considerable importance occurred in the statistics for Pennsylvania at the census of 1890, any comparison between the figures for the two censuses will be of little value. According to the figures for 1900, Pennsylvania is second in the amount of capital invested in shipbuilding, and first in the number of wage-earners and wages paid and in the value of products. Notwithstanding the omissions from the figures for 1890 it can be stated with certainty that the growth of the industry in this state has been considerable. Table 6 shows also that California, Washington, Oregon, Illinois, Maryland, New Jersey, and Wisconsin have made considerable increases. On the Pacific coast Washington and Oregon have shared with California the expansion in the shipbuilding industry, their percentages of increase being as follows: Washington, capital invested, 392.8; wages paid, 573.3; cost of materials, 1,065.1; value of products, 813.4; Oregon, capital invested, 94.1; wages paid, 183.1; cost of materials, 423.5; value of products, 301.4. The remarkable growth of the industry in the Pacific states is due in part to their large forests of the finest shipbuilding timber. Decreases, both in capital invested and in value of products, are shown in the District of Columbia, Georgia, Minnesota, Missouri, North Carolina, South Carolina, and Vermont. In Michigan the capital increased 19.2 per cent, while the value of products decreased 5.9 per cent, and in Ohio the capital increased 74.7 per cent, while the value of products decreased 5 per cent.

The rank, with respect to the principal items of information at the censuses of 1890 and 1900, of states reporting either capital or products in shipbuilding to the value of more than $1,000,000 in 1900, is given in the following statement, the number indicating the rank:

STATES.	Capital.		WAGE-EARNERS.				Cost of materials used.		Value of products.	
			Average number.		Total wages.					
	1900	1890	1900	1890	1900	1890	1900	1890	1900	1890
California	4	6	4	6	4	4	2	6	3	5
Connecticut	16	12	14	11	14	11	14	11	16	11
Delaware	11	7	10	5	11	7	9	9	11	9
Illinois	13	11	12	14	12	14	12	15	12	15
Maine	9	10	9	7	9	8	6	5	8	6
Maryland	6	8	8	10	7	10	8	10	7	10
Massachusetts	12	9	11	9	10	9	10	8	10	8
Michigan	7	2	6	8	8	3	5	1	6	2
New Jersey	8	5	7	8	5	6	7	7	5	7
New York	3	1	2	1	2	1	3	2	2	1
Ohio	5	3	5	2	6	2	11	4	9	3
Oregon	17	19	17	17	16	17	15	17	14	17
Pennsylvania	2	4	1	4	1	5	1	3	1	4
Rhode Island	15	17	16	19	15	18	16	20	15	19
Virginia	1	18	3	18	3	20	4	18	4	18
Washington	14	21	15	21	13	21	13	21	13	21
Wisconsin	10	13	13	16	17	13	17	14	17	14

It is probable that the contest for primacy in shipbuilding during the next decade will be between the Delaware River and the Chesapeake Bay districts. The capital invested in shipbuilding on the Delaware River in 1900 was $16,756,690, and the value of the prod-

ucts $18,013,279. On Chesapeake Bay the capital was $19,262,193, and the value of the products $10,263,345. The figures for the Delaware River district do not include a new shipbuilding plant of large proportions, the capital invested in which runs into the millions, but which was not in operation during the census year. The value of the shipbuilding products of the Great Lakes was almost double that of Virginia, and considerably larger than that of the Chesapeake Bay district as a whole. It was, however, less than two-thirds of that of the Delaware River district. The capital invested in shipbuilding on the shores of the Delaware River and of Chesapeake Bay is nearly one-half of the capital invested in the industry in the United States, and the value of the products of these districts is more than three-eighths that of the whole country. There can be no doubt, in view of the above facts, that these two sections possess attractions and advantages which may in time materially help in advancing the United States to a leading position among shipbuilding nations.

Table 7 presents for the United States the quantity and cost of the principal materials used, the cost of all other materials, and the number and value of steam and sailing vessels and barges built, the value of all other products, and the amount received for repair work; also the number of establishments reporting for 1899 and 1900, with the value of products for both years, for iron and steel shipbuilding.

TABLE 7.—MATERIALS AND PRODUCTS, IRON AND STEEL SHIPBUILDING: 1900.

MATERIALS USED.		PRODUCTS.	
Total cost	$23,585,549	Total value	$50,367,739
Lumber, all kinds, including logs, timber, and knees, thousand feet B.M	267,953	Vessels:	
Cost	$1,341,113	Steam, number	123
Pig and scrap iron, tons	22,639	Gross tonnage	237,379
Cost	$395,091	Net tonnage	164,313
Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds	375,383,913	Value	$24,311,343
Cost	$11,878,297	Sailing, number	6
Anchors and chains purchased	$168,726	Gross tonnage	21,085
Cordage:		Net tonnage	18,348
Wire, feet	633,175	Value	$962,600
Cost	$72,791	Barges, number	5
Manila and hemp, pounds	978,283	Gross tonnage	4,052
Cost	$142,138	Net tonnage	3,848
All other materials	$9,587,393	Value	$181,000
		All other products	$12,609,836
		Amount received for repair work	$12,302,960
		Comparison of products:	
		Number of establishments reporting for both years	41
		Value for census year	$46,262,750
		Value for preceding business year	$25,222,512

Table 7 shows that the value of the products of iron and steel shipbuilding establishments was $50,367,739, of which $24,311,343 represents the value of steam vessels, $962,600 that of sailing vessels, and $181,000 that of barges. The production of sailing vessels is almost equally divided between two states, one on the Great Lakes and the other on the Atlantic coast. The steam vessels, including steam launches, numbered 123, aggregating 237,379 gross and 164,313 net tons. The sailing vessels numbered 6, having a total of 21,085 gross and 18,348 net tons, and the barges 5, with a total of 4,052 gross and 3,848 net tons. More than one-half of the value of products was the value of new construction; about one-fourth, or $12,302,960, the value of repairs; and the remainder, $12,609,836, the value of unfinished construction and repairs.

Reference to Table 21 shows that of the 6 states separately reported, Michigan shows the minimum value per gross ton of construction, the average per gross ton being $61.34, and the maximum average of size, 4,291 tons for the 8 iron and steel vessels built. In Massachusetts and New Jersey, where the maximum value per gross ton is shown, the average tonnage per vessel was smallest. In Massachusetts the value averaged $255 per gross ton, the 3 vessels averaging 533 gross tons. In New Jersey the average value per gross ton was $242.27, the 10 vessels averaging 343 gross tons. In these 2 states the construction of river steamboats, yachts, and Government torpedo boats may account for the higher average value per gross ton. In New York, where the size of the vessels built closely approximates to that of those built in Massachusetts, the value per gross ton was not one-half that in the latter state. In Pennsylvania, where several large warships were built, the value per gross ton averaged only $104.48, and the size 3,850 gross tons, for the 22 vessels built.

In New Jersey and New York steel barges were built—1 in the former and 3 in the latter. That in New Jersey, of 500 gross tons, shows a value of $80 per gross ton, while those in New York, averaging 1,167 gross tons, were valued at $38.55 per gross ton.

In view of these wide variations in the value of vessels similar in size or type, deductions as to average value per gross ton for the United States possess no significance.

The following is a statement of the number and value of iron and steel vessels built in each state:

STATE.	Number.	Value.	STATE.	Number.	Value.
United States	134	$25,454,943	Massachusetts	3	$408,000
			Michigan	8	2,105,500
California	4	1,450,000	New Jersey	11	870,000
Delaware	13	1,908,399	New York	17	995,650
Florida	1	38,000	Ohio	8	1,649,000
Illinois	5	918,478	Oregon	2	379,000
Indiana	4	135,000	Pennsylvania	22	8,849,029
Iowa	5	228,360	Washington	2	93,000
Maine	4	724,600	Wisconsin	1	268,500
Maryland	14	1,789,542	Virginia	10	2,644,885

The above statement presents, by states, items of chief importance not in all cases disclosed in Table 21, which shows the detailed statistics for the industry. Inasmuch as the construction of iron and steel vessels has, during the census year, for the first time exceeded in value that of wooden vessels, the data shown in the statement will afford opportunities for comparisons in future censuses of the growth, by states, in this, the more important branch of the industry.

For 41 of the 44 establishments the value of products was reported for both 1899 and 1900. For the latter

year this was $46,262,750, or 91.8 per cent of the total value of products of all the 44 establishments. In the preceding year the value of products of these 41 establishments was $25,222,512. In every state except Wisconsin there was an increase in the value of products in 1900 over 1899, the aggregate increase for these 41 establishments being 83.4 per cent. Upon this basis the value of products in 1899 increased 111.2 per cent over 1890, while the value of the products in 1900 increased 287.1 per cent over 1890. It can be stated, therefore, that while the value of the products of the iron and steel branch of the industry little more than doubled in the nine years preceding the census year, it nearly doubled again in 1900, although there seems to have been but 1 iron and steel shipbuilding plant established in the latter year. This seems to indicate that the establishments were only operated at about one-half their capacity in 1899 and that the great expansion in iron and steel shipbuilding has but just commenced.

Of the $23,585,549 expended for materials in iron and steel shipbuilding, $11,878,297 was for 375,383,913 pounds of iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc.; $1,341,113 for lumber of all kinds, including logs, timbers, and knees, the lumber measuring 267,953,000 feet, board measure; and $395,091 for 22,639 tons of pig and scrap iron.

Table 21 comprehends the entire iron and steel shipbuilding industry, as conducted in private establishments. The number of such establishments was 44, of which 26 were located in six states—Maryland, Massachusetts, Michigan, New Jersey, New York, and Pennsylvania—the remaining 18 being located in California, Delaware, Florida, Illinois, Indiana, Iowa, Maine, Ohio, Oregon, Rhode Island, Virginia, Washington, and Wisconsin. The statistics for this latter group of states are not separately reported, for the reason that there are less than three establishments in each state.

Of the total number of establishments, 4 are owned by individuals, 5 by firms and limited partnerships, and 35 by incorporated companies. Six of these establishments commenced operations during the last decade, and one during the census year.

Of the capital, amounting to $59,839,555, invested in the iron and steel shipbuilding industry, $32,624,784 represents the value of the plants, consisting of land, $9,614,552; buildings, $10,925,216; machinery, tools, and implements, $12,085,016; and cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries, $27,214,771.

Table 21 also shows the number of proprietors and firm members, and officers of corporations, and general superintendents, managers, clerks, and salesmen with their salaries, and wage-earners by sex, with the amounts paid in wages.

The average number of wage earners employed during each month is stated, there being comparatively small variations in the several months, although in a few cases, in certain states, the variations are greater than in others, the changes being apparently due rather to the demands of the industry than to climatic or other unusual causes.

It is also shown that in this branch of the industry no materials are purchased in the raw state. Separate items are given showing the amounts paid for fuel, rent of power and heat, mill supplies, all other materials, and freight. Other miscellaneous expenses, such as rent of works, taxes not including internal revenue, rent of offices, insurance, interest, internal-revenue tax and stamps, ordinary repairs of buildings and machinery, advertising, and other sundries are not reported under the head of materials; in addition the different kinds of materials used are separately stated with the quantities, when possible, and cost.

Table 8 presents for the United States the quantity and cost of the principal materials used, the cost of all other materials, and the number and value of steam and sailing vessels, barges, canal boats, and small boats, the value of all other products, and the amount received for repair work; also the number of establishments reporting for 1899 and 1900, with the value of products for both years, for wooden shipbuilding.

TABLE 8.—MATERIALS AND PRODUCTS, WOODEN SHIP AND BOAT BUILDING: 1900.

MATERIALS USED.		PRODUCTS.	
Total cost	$9,901,223	Total value	$24,210,419
Lumber, all kinds, including logs, timber, and knees, thousand feet B. M	257,338	Wooden vessels:	
Cost	$4,890,728	Steam, number	396
Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds	36,277,031	Gross tonnage	48,932
Cost	$1,519,450	Net tonnage	32,845
Anchors and chains purchased	$152,880	Value	$2,994,358
Cordage:		Sailing, number	646
Wire, feet	914,656	Gross tonnage	59,291
Cost	$93,301	Net tonnage	51,847
Manila and hemp, pounds	1,436,929	Value	$3,251,069
Cost	$223,686	Barges, number	839
All other materials	$3,021,228	Gross tonnage	295,508
		Net tonnage	251,689
		Value	$3,828,170
		Canal boats, number	72
		Gross tonnage	21,434
		Net tonnage	19,949
		Value	$227,874
		Small boats, launches and ships', fishing, pleasure, life, and row boats, etc., number	15,448
		Value	$1,972,825
		All other products	$1,070,297
		Amount received for repair work	$10,866,326
		Comparison of products:	
		Number of establishments reporting for both years	898
		Value for census year	$21,643,485
		Value for preceding business year	$17,386,228

Of the materials used in wooden shipbuilding, Table 8 shows that $4,890,728 was expended for lumber of all kinds, including logs, timber, and knees, measuring 257,338,000 feet, board measure; and $1,519,450 for iron and steel materials, weighing 36,277,031 pounds.

Of the value of products, amounting to $24,210,419, the sum of $2,994,358 represented the value of 396 steam vessels of 48,932 gross and 32,845 net tons; $3,251,069, that of 646 sailing vessels of 59,291 gross

and 51,847 net tons; $3,828,170, that of 839 barges of 295,508 gross and 251,689 net tons; $227,374, that of 72 canal boats of 21,434 gross and 19,949 net tons; $1,972,825, that of 15,448 small boats; $1,070,297, that of all other products, consisting of unfinished new vessels and small boats, and unfinished repairs; and $10,866,326, that of repair work.

The average value per gross ton of wooden steam vessels is $61.19, of sailing vessels $54.83, of barges $12.95, and of canal boats $10.61. There is a wide variation in different parts of the country in the average value per gross ton of steam vessels.

Reference to Table 22 shows that in Indiana 20 vessels of a total of 10,159 gross tons averaged $27.28 per gross ton; in Connecticut 25 vessels of a total of 1,102 gross tons averaged $37.59; in Wisconsin 12 vessels of a total of 382 gross tons averaged $134.58; in New York 87 vessels of 4,817 gross tons averaged $111.12; in Michigan 17 vessels of a total of 4,710 gross tons averaged $63.99; in Ohio 15 vessels of a total of 1,262 gross tons averaged $60.36; in California 28 vessels of a total of 3,922 gross tons averaged $71.52; in Washington 21 vessels of a total of 6,298 gross tons averaged $57.67; and in Oregon 16 vessels of a total of 4,899 gross tons averaged $54.36.

In wooden sailing vessels the variations are nearly as wide. In Massachusetts 128 vessels of a total of 3,889 gross tons averaged $98.74; in New York 85 vessels of a total of 1,400 gross tons averaged $99.78; in California 22 vessels of a total of 8,256 gross tons averaged $67.93; in Washington 30 vessels of a total of 8,963 gross tons averaged $55.27; in Maine 73 vessels of a total of 26,683 gross tons averaged $40.76; and in Delaware 3 vessels of a total of 1,600 gross tons averaged $29.38.

The variation is greatest in the values per ton of barges. In Pennsylvania, 174 barges, averaging 378.6 gross tons, had a value of only $1.90 per gross ton. In this state, large numbers of roughly built barges are constructed near Pittsburg for carrying coal down the Ohio and Mississippi rivers to New Orleans. In Minnesota 5 barges of a total of 664 gross tons averaged $48.84; and in Michigan 2 barges of a total of 1,225 gross tons averaged $49.43. In the two states last named, the vessels were built to withstand the storms of the Great Lakes. In Maine 34 barges of a total of 25,286 gross tons averaged $30.25; in New York 172 barges of a total of 62,100 gross tons averaged $14.07; in New Jersey 40 barges of a total of 42,487 gross tons averaged $8.16; in Connecticut 31 barges of a total of 18,746 gross tons averaged $28.52; and in Delaware 22 barges of a total of 10,125 gross tons averaged $18.81. In New Jersey and New York the barges were largely of the type used in conveying coal around the harbor of New York and in inland waters; in Maine, Connecticut, and Delaware they were of a heavier type, in some cases adapted to coast navigation. In California 35 barges of a total of 6,726 gross tons had an average value of $21.07; and in Washington 116 barges of a total of 2,478 gross tons had an average value of $30.63.

Reference to Table 22 shows that in 1900 there were 1,072 private establishments engaged in wooden shipbuilding, and in the construction of boats, masts, and spars, and in the repairing of wooden vessels. Of these establishments, 400 commenced operations during the decade, 51 of which were established during the census year. This by no means indicates that the wooden shipbuilding industry is becoming extinct, although it has been largely superseded by steel constructions. As compared with the statistics for wooden shipbuilding for 1890 there is an increase of 84 establishments, which would indicate, considering the commencement of 400 new ones during the decade, that no less than 316 of those in existence in 1890 had ceased to exist in 1900, at least as wooden shipbuilding establishments. This shows that quite a change was going on in the industry. From 1890 to 1900 there was a gain in Alabama of 1 establishment, in California of 8, in Connecticut of 6, in the District of Columbia of 1, in Idaho of 1, in Illinois of 7, in Indiana of 3, in Iowa of 5, in Louisiana of 2, in Maine of 30, in Maryland of 10, in Minnesota of 6, in Mississippi of 4, in Missouri of 5, in New Hampshire of 6, in New Jersey of 3, in New York of 5, in Oregon of 2, in Pennsylvania of 5, in Rhode Island of 6, in Tennessee of 2, in Virginia of 10, in Washington of 20, in West Virginia of 4, and in Wisconsin of 13. There was a loss in Florida of 1, in Kentucky of 19, in Massachusetts of 25, in Michigan of 10, in North Carolina of 2, and in Ohio of 9.

Not in all cases, however, has a decrease in number of establishments been accompanied with a loss of capital or of value of products, and not in every case of increase in number of establishments has there been a corresponding increase in capital invested and in value of products. In California, while there was an increase of 8 establishments, there was a decrease of $67,791, or 18.5 per cent, in capital, but an increase of $682,001, or 70.2 per cent, in the value of products. In Connecticut there was an increase of 6 in number of establishments, of $36,930, or 6.5 per cent, in capital invested, and $173,819, or 16.5 per cent, in the value of products. In Florida there was a loss of 1 establishment, but an increase of $56,003, or 60.1 per cent, in the capital, and of $186,971, or 274.9 per cent, in the value of products. In Maine there was an increase of 30 establishments and of $288,064, or 28 per cent, in capital, but a decrease of $326,800, or 11.6 per cent, in value of products. In Massachusetts there was a decrease of 25 establishments, of $101,168, or 8.2 per cent, in capital, and of $488,073, or 21.7 per cent, in value of products. In no other state was the decrease so great as in Michigan, the decrease being 10 in number of establishments, $2,140,617, or 72.7 per cent, in capital, and $2,117,210, or 60.1 per cent, in value of products. In New Jersey there was an increase of 3 in number of establishments,

$290,865, or 21.1 per cent, in capital, but a decrease of $254,379, or 11.5 per cent, in value of products. In New York there was an increase of 5 in number of establishments, with an increase of $2,597,496, or 73.3 per cent, in capital, a larger gain in capital than is shown for any other state in wooden shipbuilding, but there was a decrease of $25,841 in the value of products. In Ohio there was a decrease of 9 in number of establishments, of $559,471, or 66.3 per cent, in capital, and of $617,857, or 56 per cent, in value of products. In Oregon, with an increase of 2 in number of establishments, there was a decrease of $178,375, or 58.4 per cent, in capital, and an increase of $333,670, or 104 per cent, in value of products. In Washington there was an increase of 20 in number of establishments, of $494,164, or 916.5 per cent, in capital, and of $1,378,164, or 1,081 per cent, in value of products. The percentage of increase in Washington in wooden shipbuilding is remarkable, being next to that of Virginia in steel shipbuilding. As in Virginia, so it is in Washington. The proximity of the coast to the almost inexhaustible supply of shipbuilding materials is an explanation of the great growth recorded. In Wisconsin there was an increase of 13 in number of establishments, of $287,397, or 52.8 per cent, in capital, and of $244,835, or 52.9 per cent, in value of products. In Virginia there was an increase of 10 in number of establishments and of $10,256, or 3.3 per cent, in capital, with a decrease of $33,198, or 11.2 per cent, in value of products.

From such conditions as have been shown but very little intelligible deduction is possible. On the Great Lakes, with the exception of Wisconsin, the wooden shipbuilding industry is evidently declining. On the Atlantic it holds its own, while on the Pacific coast it has advanced, owing to large forests of the finest shipbuilding timber.

The amount of capital invested in wooden shipbuilding was $17,523,146, of which $9,944,225 was invested in plant, divided into $3,868,999 for land, $2,182,156 for buildings, and $3,893,070 for machinery, tools, and implements, leaving the sum of $7,578,921 in cash on hand, bills receivable, unsettled ledger accounts, raw materials, stock in process of manufacture, finished products on hand, and other sundries.

Establishments reporting in 1900 products valued at $21,643,485, or 89.4 per cent of the total of $24,210,419, reported also the value of their products for 1899—$17,386,228. In every state reported separately in Table 22, except Indiana, Minnesota, and Tennessee, there was an increase in the value of the products in 1900 over 1899, the aggregate increase being 24.5 per cent. For certain states the increases from 1899 to 1900 in the value of the products of establishments reporting for both years were as follows: California, 18.3 per cent; Connecticut, 39.1 per cent; Maine, 46.6 per cent; Massachusetts, 33.2 per cent; New Jersey, 24.5 per cent; New York, 18.5 per cent; and Washington, 45.3 per cent. At the close of the census year nearly all the large shipyards in both branches of the industry were engaged in the construction of vessels which could not be reported as finished. Careful estimates of the approximate value of such uncompleted work, based on the labor and materials employed, were made by the builders. The valuations thus reached are included in Tables 7, 8, 21, and 22, under "all other products." Thus a large proportion of the total under that heading represents the value of important steel shipbuilding operations, while nearly all of the products so classified are for maritime use and are properly included in the shipbuilding of the country. The total value of the unfinished vessels in the large shipyards of the country at the close of the census year was closely estimated by the builders, and the aggregate value was $9,336,897. Reports of this character were received from 14 establishments, located in the following states: Connecticut, 1; Delaware, 1; Illinois, 1; Maine, 2; Maryland, 1; Michigan, 2; New Jersey, 1; New York, 2; Ohio, 1; Pennsylvania, 1; Virginia, 1.

Summarizing the new construction of vessels of all kinds—steam, sailing, barges, and canal boats, both iron and steel and wooden—there were constructed in American shipyards during the year ending May 31, 1900, 2,087 vessels of a total of 687,681 gross tons. Of these, 519, of a total of 286,311 gross tons, were steam; 652, of a total of 80,376 gross tons, were sailing vessels; 844, of a total of 299,560 gross tons, were barges; and 72, of a total of 21,434 gross tons, were canal boats. Of the 2,087 vessels built, 134, of a total of 262,516 gross tons, were of iron and steel, divided as follows: 123 steam vessels of a total of 237,379 gross tons, 6 sailing vessels of a total of 21,085 gross tons, and 5 canal boats of a total of 4,052 gross tons. The wooden vessels numbered 1,958, of a total of 425,165 gross tons, divided as follows: 396 steam vessels of a total of 48,932 gross tons, 646 sailing vessels of a total of 59,291 gross tons, 839 barges of a total of 295,508 gross tons, and 72 canal boats of a total of 21,434 gross tons.

Tables 9, 10, 11, and 12 present statistics of shipbuilding on the Great Lakes, as follows: Table 9, a summary of all shipbuilding for 1900; Tables 10 and 11, summaries of iron and steel shipbuilding and wooden shipbuilding, respectively, for 1900; Table 12, a comparative summary of iron and steel shipbuilding for 1890 and 1900, with the percentages of increase.

TABLE 9.—SUMMARY OF SHIPBUILDING ON THE GREAT LAKES, WOODEN AND IRON AND STEEL: 1900.

Number of establishments	122
Capital	$15,185,173
Salaried officials, clerks, etc., number	217
Salaries	$306,987
Wage-earners, average number	8,517
Total wages	$4,331,065
Miscellaneous expenses	$556,466
Cost of materials used	$4,966,250
Value of products, including repairing	$11,953,854

TABLE 10.—IRON AND STEEL SHIPBUILDING ON THE GREAT LAKES: 1900.

Number of establishments	[1] 8
Capital	$12,509,788
Salaried officials, clerks, etc., number	140
Salaries	$230,330
Wage-earners, average number	6,388
Total wages	$3,130,005
Miscellaneous expenses	$405,446
Cost of materials used	$4,003,854
Value of products:	
Total	$9,247,305
Steam vessels:	
Number	21
Gross tonnage	81,211
Net tonnage	60,228
Value	$4,633,628
Sailing vessels:	
Number	3
Gross tonnage	15,117
Net tonnage	14,001
Value	$550,000
All other products	$2,035,038
Repair work	$2,028,639

TABLE 11.—WOODEN SHIPBUILDING ON THE GREAT LAKES: 1900.

Number of establishments	[2] 114
Capital	$2,675,385
Salaried officials, clerks, etc., number	77
Salaries	$76,657
Wage-earners, average number	2,129
Total wages	$1,201,060
Miscellaneous expenses	$151,020
Cost of materials used	$962,396
Value of products:	
Total	$2,706,549
Steam vessels:	
Number	57
Gross tonnage	5,872
Net tonnage	4,808
Value	$380,450
Sailing vessels:	
Number	27
Gross tonnage	3,044
Net tonnage	2,928
Value	$134,000
Barges:	
Number	8
Gross tonnage	3,083
Net tonnage	2,813
Value	$131,754
Canal boats:	
Number	12
Gross tonnage	2,914
Net tonnage	2,164
Value	$33,600
Small boats:	
Number	2,096
Value	$333,034
All other products	$76,404
Repair work	$1,617,307

[1] Distributed as follows: On Lake Superior—Wisconsin, 1; on Lake Michigan—Illinois, 1; on Lake Huron—Michigan, 1; on Lake Erie—Ohio, 2, and New York, 1; on St. Clair River—Michigan, 1; on Detroit River—Michigan, 1.

[2] Distributed as follows: On Lake Superior—Minnesota, 5; Wisconsin, 3; Michigan, 2; on Lake Michigan—Michigan, 10; Wisconsin, 9; Illinois, 8; on Lake Huron—Michigan, 9; on Lake Erie—Ohio, 11; Pennsylvania, 1; New York, 8; on Lake Ontario—New York, 20; on St. Marys River—Michigan, 1; on St. Clair River—Michigan, 8; on Lake St. Clair—Michigan, 3; on Detroit River—Michigan, 12; on Niagara River—New York, 4.

TABLE 12.—COMPARATIVE SUMMARY, IRON AND STEEL SHIPBUILDING ON THE GREAT LAKES: 1890 AND 1900.

	1900	1890	Per cent of increase.
Number of establishments	8	8	.....
Capital	$12,509,788	$3,034,580	312.2
Salaried officials, clerks, etc., number	140	[1] 46	204.3
Salaries	$230,330	[1] $90,160	155.5
Wage-earners, average number	6,388	2,544	151.1
Total wages	$3,130,005	$1,298,789	141.0
Miscellaneous expenses	$405,446	$69,826	480.7
Cost of materials used	$4,003,854	$1,767,922	126.5
Value of products	$9,247,305	$4,321,400	114.0
Iron and steel vessels:			
Number	24	33	[2] 27.3
Gross tonnage	96,328	[3] 36,728	162.3
Value	$5,183,628	$4,128,000	25.6
All other products, including amount received for repair work	$4,063,677	$193,400	2,001.2

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900.

[2] Decrease.

[3] Kind of tonnage not reported in 1890.

Comparison of Table 9 with the totals for the industry in the United States shows that while only 10.9 per cent of the total number of shipbuilding establishments were located on the Great Lakes, the capital invested there was 19.6 per cent of the total capital, the number of wage-earners employed, 18.2 per cent of the total number; the wages paid, 17.4 per cent of the total wages; and the value of products, consisting of iron and steel and wooden vessels, boats, masts, spars, and oars, and repairing, constituted 16 per cent of the total value of products.

Table 10 shows that only 8 establishments on the Great Lakes constructed iron and steel vessels during the census year, but their capital, averaging $1,563,723 per establishment, and the value of their products constituted 82.4 and 77.3 per cent, respectively, of the corresponding totals for all shipbuilding establishments on the Great Lakes. There were 114 establishments engaged in the construction of wooden vessels, small boats, masts, and spars, and repairing, but their capital investment amounted to only $2,675,385, an average of $23,468. Of the total gross tonnage of wooden vessels constructed in the United States in 1900, Table 11 shows that only 3.5 per cent, with a value constituting 6.6 per cent of the total, was turned out by the Great Lakes shipyards. Of the total gross tonnage of iron and steel vessels, 36.7 per cent was built there, with a value constituting 20.4 per cent of the total value.

As shown by Table 12, the number of iron and steel shipbuilding establishments on the Great Lakes was the same at the censuses of 1890 and 1900. Very large increases are shown, however, in the items of capital, wage-earners, wages, cost of materials used, and value of products. The number of vessels constructed decreased from 33 to 24, but they were of considerably

larger tonnage. Assuming that the tonnage reported in 1890 was gross, the average gross tonnage of vessels was 4,014 in 1900, compared with 1,113 in 1890.

In the Southern states, during the last decade, the growth in shipbuilding was probably greater than in any other geographical division of the United States. This was due in a large measure to the remarkable increase made in Virginia. The capital invested increased from $4,467,860 in 1890 to $22,476,618 in 1900, or 403.1 per cent. In 1890 it constituted 16.4 per cent of shipbuilding capital in the United States, and in 1900, 29.1 per cent. The increase in the capital invested in shipbuilding in the United States during the past decade amounted to $50,099,809, of which $18,008,758, or 35.9 per cent, was placed in Southern shipbuilding establishments.

In 1890 the value of the products of shipbuilding in the South was $5,485,116, or 14.4 per cent of the total for the United States; in 1900 it was $14,905,422, or 20 per cent of the total, showing an increase of 171.7 per cent.

Table 13 presents statistics for wooden ship and boat building and repairing in cities of 20,000 population and over for 1900.

TABLE 13.—SHIP AND BOAT BUILDING, WOODEN, BY CITIES: 1900.

CITIES.	Number of establishments.	Capital.	SALARIED OFFICIALS, CLERKS, ETC.		WAGE-EARNERS.		Miscellaneous expenses.	Cost of materials used.	Value of products, including repairing.
			Number.	Salaries.	Average number.	Total wages.			
Total	422	$10,317,854	337	$370,024	8,333	$4,722,895	$680,935	$4,276,135	$12,449,833
Baltimore, Md	14	469,015	17	16,716	413	233,532	25,445	164,437	555,862
Bangor, Me	4	7,900			14	8,683	652	4,837	20,638
Bay City, Mich	4	9,125	1	1,500	63	36,600	611	21,290	132,909
Bayonne, N. J	3	77,400	8	4,183	23	8,292	1,167	17,275	42,000
Boston, Mass	30	643,760	26	20,510	653	416,417	102,144	451,779	1,120,763
Bridgeport, Conn	3	10,601			24	17,685	2,020	6,434	32,871
Buffalo, N. Y	8	574,826	9	10,091	162	86,547	22,867	65,922	216,486
Camden, N. J	9	219,712	12	8,594	266	177,218	21,452	142,778	409,500
Chester, Pa	3	13,550			10	6,450	617	6,175	17,775
Chicago, Ill	7	284,072	9	13,010	160	86,469	8,396	55,114	187,083
Cincinnati, Ohio	4	59,800	4	3,760	103	32,899	15,047	24,254	98,114
Cleveland, Ohio	3	9,025			42	21,400	1,603	13,200	43,950
Detroit, Mich	10	75,021	8	5,556	91	47,836	9,426	35,983	123,635
Duluth, Minn	5	80,482	7	7,580	71	41,760	8,055	30,990	102,316
Gloucester, Mass	24	145,172	6	5,860	102	62,800	12,160	74,531	201,448
Jacksonville, Fla	3	4,625			12	3,864	712	2,582	11,154
Jersey City, N. J	5	151,400	7	12,200	212	116,693	19,624	70,204	259,000
Kingston, N. Y	4	90,000	1	1,500	146	93,476	4,004	88,560	207,201
Minneapolis, Minn	3	1,365			1	420	99	743	2,395
Mobile, Ala	4	146,026	3	4,300	291	100,816	6,013	75,218	236,142
New Bedford, Mass	11	13,650			22	12,760	1,699	6,073	27,925
New Haven, Conn	5	17,400			11	7,190	808	6,925	19,635
New Orleans, La	6	171,847	19	11,032	137	57,402	8,953	25,773	132,771
New York, N. Y	83	3,974,116	77	117,576	2,484	1,493,448	144,872	1,267,853	3,919,804
Norfolk, Va	6	184,550	8	7,900	104	50,926	4,071	32,164	129,148
Oshkosh, Wis	4	39,641	1	468	33	15,342	1,134	17,913	56,310
Philadelphia, Pa	10	51,955			69	38,184	4,143	21,342	91,957
Portland, Me	6	5,275			14	10,016	643	1,750	22,350
Portland, Oreg	9	97,620	6	8,000	261	120,044	6,187	186,890	399,717
Providence, R. I	3	81,701	2	2,500	51	37,240	2,867	20,650	80,904
Quincy, Mass	3	38,805	2	2,500	18	10,360	806	10,925	16,150
Rochester, N. Y	7	30,552			6	3,010	1,181	8,507	20,109
St. Louis, Mo	4	23,592	3	3,070	58	41,696	6,000	23,187	77,326
St. Paul, Minn	3	13,125			5	2,428	199	6,492	10,275
Salem, Mass	3	5,460			8	6,250	398	3,215	13,200
San Francisco, Cal	21	112,290	11	10,000	334	201,706	69,296	287,047	646,084
Seattle, Wash	12	237,925	9	6,842	184	130,081	13,170	159,081	429,641
Tacoma, Wash	3	117,584	7	11,280	169	95,602	8,855	115,965	209,750
Toledo, Ohio	4	64,505			53	25,694	494	24,742	65,950
Waltham, Mass	3	21,655	1	260	9	5,500	2,494	4,003	18,900
Washington, D. C	3	14,465			17	11,480	154	6,989	24,980
Wilmington, Del	4	182,226	7	8,936	176	94,114	6,212	123,282	301,018
All other cities[1]	59	1,745,038	66	64,240	1,251	653,565	134,194	563,061	1,714,697

[1] Includes establishments distributed as follows: Akron, Ohio, 2; Albany, N. Y., 2; Allegheny, Pa., 2; Burlington, Iowa, 2; Cambridge, Mass., 2; Charleston, S. C., 1; Chattanooga, Tenn., 1; Chelsea, Mass., 2; Clinton, Iowa, 1; Covington, Ky., 1; Dubuque, Iowa, 2; Elizabeth, N. J., 1; Elmira, N. Y., 1; Erie, Pa., 1; Fall River, Mass., 1; Galveston, Tex., 1; Grand Rapids, Mich., 2; Hartford, Conn., 1; Hoboken, N. J., 2; Indianapolis, Ind., 1; Jamestown, N. Y., 2; Kalamazoo, Mich., 1; Knoxville, Tenn., 1; La Crosse, Wis., 1; Lawrence, Mass., 1; McKeesport, Pa., 1; Milwaukee, Wis., 1; Memphis, Tenn., 1; New Brunswick, N. J., 1; Newton, Mass., 1; Oakland, Cal., 2; Oswego, N. Y., 1; Paterson, N. J., 1; Pittsburg, Pa., 2; Poughkeepsie, N. Y., 1; Quincy, Ill., 1; Racine, Wis., 1; Sacramento, Cal., 1; Saginaw, Mich., 1; San Jose, Cal., 1; Superior, Wis., 1; Taunton, Mass., 1; Trenton, N. J., 1; Troy, N. Y., 1; Wilkesbarre, Pa., 1; Wilmington, N. C., 1; Yonkers, N. Y., 1.

Table 13 shows that of the 1,072 wooden ship and boat building establishments in the United States, 422, or 39.4 per cent, are located in cities with a population of 20,000 and over. The value of the products of these establishments was $12,449,833, which was 51.4 per cent of the total for the United States. The statistics shown do not represent the entire shipbuilding operations of the several cities included in the above table. It was impossible to present the combined statistics for iron and steel and wooden shipbuilding in this manner without danger of disclosing individual operations in the industry. There were one or more iron and steel

shipbuilding establishments located in each of the following cities: Baltimore, Md., 3; Boston, Mass., 2; Buffalo, N. Y., 1; Camden, N. J., 1; Chester, Pa., 1; Chicago, Ill., 1; Cleveland, Ohio, 1; Detroit, Mich., 1; Dubuque, Iowa, 1; Elizabeth, N. J., 1; Hoboken, N. J., 2; Jacksonville, Fla., 1; Newburg, N. Y., 1; New York, N. Y., 7; Philadelphia, Pa., 2; Portland, Oreg., 1; Richmond, Va., 1; San Francisco, Cal., 2; Seattle, Wash., 1; Superior, Wis., 1; Toledo, Ohio, 1; Wilmington, Del., 2. The statistics of iron and steel shipbuilding in several of the foregoing cities greatly exceed those of wooden shipbuilding. This is notably the case in Philadelphia, Pa., San Francisco, Cal., Cleveland, Ohio, Wilmington, Del., Chicago, Ill., Detroit, Mich., Chester, Pa., Elizabeth, N. J., Baltimore, Md., and Hoboken, N. J., which are the ten leading cities in the value of products, ranked in the order in which they are given.

Table 14 presents the detailed items of capital invested in the shipbuilding industry in the United States, with the percentage that each forms of the total.

TABLE 14.—ITEMS OF CAPITAL INVESTED IN SHIPBUILDING AND PERCENTAGE THAT EACH FORMS OF THE TOTAL: 1900.

	Capital.	Per cent of total.
Total capital	$77,362,701	100.0
Total value of plant	42,569,009	55.0
Land	13,483,551	17.4
Buildings	13,107,372	17.0
Machinery, tools, and implements	15,978,086	20.6
Cash and sundries	34,793,692	45.0

Table 15 shows the percentages that the items reported for each branch of the industry, iron and steel shipbuilding and wooden shipbuilding, under the general heads of this inquiry, form of the corresponding totals for the entire industry.

TABLE 15.—PERCENTAGES THAT THE SEVERAL ITEMS FOR EACH BRANCH OF SHIPBUILDING FORM OF THE TOTAL FOR THAT ITEM FOR THE ENTIRE INDUSTRY: 1900.

	Iron and steel.	Wooden.[1]
Capital	77.3	22.7
Salaried officials, clerks, etc., number	60.9	39.1
Salaries	70.3	29.7
Wage-earners, average number	66.1	33.9
Total wages	65.3	34.7
Miscellaneous expenses	71.7	28.3
Cost of materials used	70.4	29.6
Value of products, including repairing	67.5	32.5

[1] Including small boats, spar making, rigging, and repairing.

Table 16 shows the sums expended for the different materials used in shipbuilding and the percentage that each is of the total cost of materials.

TABLE 16.—COST OF DIFFERENT MATERIALS USED IN SHIPBUILDING AND THE PERCENTAGE THAT EACH FORMS OF THE TOTAL: 1900.

	Cost.	Per cent of total.
Total cost of materials	$33,486,772	100.0
Lumber, all kinds, including logs, timber, and knees	6,231,841	18.6
Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, pig and scrap iron, etc.	13,792,838	41.2
Anchors and chains purchased	321,556	1.0
Cordage:		
Wire	166,092	0.5
Manila and hemp	365,824	1.1
Duck	177,866	0.5
Paints, oils, etc	721,865	2.2
Oakum and pitch	275,052	0.8
Masts and spars purchased	223,601	0.7
Blocks purchased	85,202	0.2
Machinery and boilers purchased	3,082,977	9.2
Fittings and furniture purchased	808,516	2.4
All other materials, including fuel, rent of power and heat, mill supplies, freight, etc	7,232,882	21.6

Table 16, compared with a similar table appearing in the report on shipbuilding at the Eleventh Census, shows that the cost of lumber used has increased but slightly. In 1890 it was $5,995,894 and in 1900 it was $6,231,841, an increase of $235,947, or only 3.9 per cent. The cost of metal used increased from $4,872,074 in 1890 to $13,792,838 in 1900, an increase of $8,920,764, or 183.1 per cent. The cost of machinery and boilers purchased in 1890 was $2,913,856 and in 1900, $3,082,977, an increase of $169,121, or 5.8 per cent. In view of the large increase in the number and tonnage of steam vessels, the small increase in the amount expended by shipbuilders, for boilers and machinery purchased, indicates that the equipment of their plants had been sufficiently increased to enable a large proportion of them to manufacture the machinery and boiler equipment of the vessels built, without recourse to specialists in these lines of manufacturing industry. It should be stated at this point that the tables presenting the cost of materials in detail in 1890 included governmental establishments, and it has been found impossible to separate the detailed items reported by such establishments; to some extent, therefore, the value of the statistics is impaired for comparative purposes, as such data are not included in Table 16. The total cost of materials reported by governmental establishments in 1890 was $403,863.

So large a number of the establishments reporting were exclusively engaged in the building of small boats, in repair work, or in other distinct branches of the industry, that tables are here presented giving separately the number of such establishments by states, with their capital and value of products, in order that by deduction from the general tables the totals for shipbuilding proper may be ascertained, and computations based thereon rendered more accurate and valuable. The most numerous among such establishments are those devoted exclusively to the construction of small boats, as shown in Table 17.

Table 17 shows, by states, the number of establish-

ments, capital invested, and value of products of establishments engaged exclusively in the manufacture and repair of small boats, including power launches, ships' boats, lifeboats and life rafts, rowboats, and sailboats under 5 tons measurement.

TABLE 17.—ESTABLISHMENTS ENGAGED IN THE CONSTRUCTION AND REPAIR OF SMALL BOATS, WITH CAPITAL AND VALUE OF PRODUCTS, BY STATES: 1900.

STATES.	Number of establishments.	Capital.	Value of products, including repairing.
United States	363	$2,596,887	$2,330,229
California	10	23,700	71,475
Connecticut	17	47,491	110,565
Delaware	4	27,254	28,818
Florida	7	6,107	13,626
Illinois	4	2,272	15,158
Indiana	9	37,565	53,560
Iowa	5	3,975	6,054
Maine	46	78,652	95,711
Maryland	10	30,755	45,919
Massachusetts	45	208,559	271,114
Michigan	27	85,727	158,069
Minnesota	12	17,710	26,630
Missouri	3	11,215	12,210
New Jersey	21	39,490	59,799
New York	71	1,707,010	1,046,698
North Carolina	4	7,435	6,593
Ohio	9	24,765	52,605
Pennsylvania	7	33,430	42,926
Rhode Island	10	26,245	26,405
Virginia	6	7,225	11,854
Washington	9	9,250	16,317
Wisconsin	16	91,895	133,625
All other States[1]	11	19,160	24,438

[1] Includes establishments distributed as follows: District of Columbia, 1; Idaho, 1; Kentucky, 2; Louisiana, 2; Tennessee, 1; Texas, 2; Vermont, 2.

Table 17 includes a certain number of establishments that were engaged solely in the construction and repair of small boats during the census year, although equipped for the building of larger vessels and occasionally so occupied. No establishments were included, however, whose reports showed repair work on small boats alone and no new construction. In this connection it should be stated that the statistics presented in Table 17 differ from those applying to small boats shown in Tables 20 and 22, in that the latter show the total construction of such vessels in the United States, many being the output of establishments engaged principally in the more important branches of the industry.

It is important to state that, in order to carry out the general plan of showing separately the statistics for iron and steel and for wooden shipbuilding in the United States, it was necessary, in the case of 2 establishments largely engaged in each class of construction, to consider each establishment as 2 separate plants, and to treat them as such in the tabulations, including under iron and steel shipbuilding the output in that class and the materials used in it, with an equitable proportion of the investment values, wages, etc. The same course was followed under wooden construction. In the case of one of these establishments the output under wooden shipbuilding, so segregated, was small-boat construction. As its inclusion in Table 17 adds more to the total than any other plant, it is proper to state that steel-shipbuilding operations of an important character were carried on by this firm during the census year. Its inclusion, however, is justified, not only by the large output, but by the fact that to all intents and purposes of the present census the establishment is considered as 2 separate and distinct plants.

Table 18 shows, by states, the number of establishments, capital invested, and value of products of establishments engaged exclusively in repairing. Plants maintained by transportation companies for the repair of their own vessels are not included.

TABLE 18.—ESTABLISHMENTS ENGAGED DURING THE CENSUS YEAR IN REPAIR WORK EXCLUSIVELY, WITH CAPITAL AND VALUE OF WORK DONE, BY STATES: 1900.

STATES.	Number of establishments.	Capital.	Value of work done.
United States	215	$7,154,552	$7,418,489
Alabama	3	49,800	131,116
Connecticut	7	82,650	151,227
Florida	3	13,894	11,194
Illinois	9	345,830	253,208
Louisiana	5	149,100	80,791
Maine	15	127,318	166,262
Maryland	12	116,971	141,939
Massachusetts	16	920,707	1,042,690
Michigan	15	278,525	325,800
New Jersey	16	627,313	628,660
New York	48	2,960,711	2,557,262
North Carolina	5	48,560	50,015
Ohio	9	61,490	117,764
Pennsylvania	9	142,833	103,989
Rhode Island	4	242,676	749,810
Virginia	15	218,942	194,648
Washington	3	113,484	183,000
West Virginia	3	34,455	26,495
All other states[1]	18	619,293	502,669

[1] Includes establishments distributed as follows: California, 2; Delaware, 1; District of Columbia, 1; Iowa, 2; Kentucky, 2; Minnesota, 2; Mississippi, 1; New Hampshire, 2; Oregon, 1; South Carolina, 1; Texas, 1; Wisconsin, 2.

In point of capital invested and value of products, Table 18 shows, in comparison with the statistics presented in Table 17, that the establishments engaged exclusively in repairing formed the most important group of the subsidiary branches of the shipbuilding industry. A large part of the repair work throughout the country is carried on by plants also engaged in construction work, and is, therefore, shown in Tables 21 and 22; but the establishments included in Table 18 did no other work than repairing during the census year, although many are equipped for building new vessels and are at times so employed.

In addition to the branches of the industry covered by Tables 17 and 18, there are also included in the general tables a number of contributory industries carried on as separate trades, such as rigging, spar making, and calking. Almost all of the work reported by such establishments was a part of the construction of new vessels during the census year, and has, accordingly, been included with shipbuilding proper; a large proportion of the work was done by contract, in the shipyard, and would otherwise have been done by the builders themselves. It is important that this should be taken into consideration in basing computations on the general totals, and the total investment and the

value of the work done by such establishments are given here in order that they may be deducted from shipbuilding proper.

Reports were received from 32 establishments in the United States engaged in spar making, calking, and ship fitting, showing an aggregate capital of $208,633, and products valued at $405,323. They were located as follows: California, 2; Connecticut, 2; Maine, 5; Massachusetts, 12; New Jersey, 2; New York, 6; Oregon, 2; Pennsylvania, 1. Reports were received from 30 ships' riggers, showing an aggregate capital of $94,575, and products valued at $253,015. They were located as follows: California, 1; Maine, 5; Massachusetts, 13; New York, 5; Ohio, 1; Pennsylvania, 5. Reports were received from 7 establishments engaged exclusively on *ship-joiner work, their capital aggregating $108,158*, and the value of their products $209,310. They were located as follows: Maryland, 2; Massachusetts, 3; New York, 2. Other minor contributory industries are included in the general report for manufactures of the Twelfth Census, sailmaking being classified under "awnings, tents, and sails."

Table 19 shows the number of establishments, capital, and value of work done at plants maintained by transportation companies for the construction and repair of their own vessels exclusively, no work being performed on contract. The table also includes plants operated by railroad companies for the exclusive repair of their floating equipment.

TABLE 19.—TRANSPORTATION COMPANIES ENGAGED IN THE CONSTRUCTION AND REPAIR OF VESSELS, WITH CAPITAL AND VALUE OF PRODUCTS, BY STATES: 1900.

STATES.	Number of establishments.	Capital.	Value of products, including repairing.
United States	20	$1,112,068	$2,428,335
California	4	75,300	779,264
Connecticut	3	73,000	167,279
Massachusetts	2	80,500	120,200
New Jersey	3	542,250	376,127
New York	*3*	*81,000*	*132,354*
Ohio	1	5,000	20,000
Pennsylvania	2	14,000	68,105
Rhode Island	1	160,000	678,506
Wisconsin	1	81,018	87,000

Table 20 shows the total small-boat construction of the United States, by states, giving the number and value of each class, and supplements by its greater detail the data relating to small-boat construction presented in other tables.

TABLE 20.—SMALL BOATS, BY STATES: 1900.

STATES.	SMALL BOATS.									
	Steam launches.[1]				Power launches other than steam—electric, gasoline, naphtha, alcohol, vapor, etc.		Sailboats under 5 tons—pleasure and fishing.		Rowboats—pleasure, fishing, life, racing, ships', hunting, and canvas canoes.	
	Number.	Gross tonnage.	Net tonnage.	Value.	Number.	Value.	Number.	Value.	Number.	Value.
United States	96	848	453	$143,660	1,689	$1,060,365	4,317	$473,307	9,442	$489,153
California	11	50	23	9,600	14	9,800	263	58,810	320	31,405
Connecticut	22	189	104	13,050	159	56,855	77	12,202	82	3,050
Delaware					3	1,450	7	1,500	285	26,192
District of Columbia							7	500		
Florida	2	18	9	900	1	1,000	37	18,030	59	1,641
Illinois	9	48	28	8,800	5	5,950	80	4,848	276	10,100
Indiana	2	51	29	1,550	81	40,400	8	840	435	5,900
Iowa					2	1,404	8	880	30	1,965
Kentucky									45	800
Louisiana							5	875	33	1,060
Maine	3	8	3	335	8	5,895	353	35,388	1,539	52,288
Maryland					17	12,500	97	10,780	160	12,074
Massachusetts	7	61	35	23,850	41	49,383	2,099	98,242	1,661	61,339
Michigan	12	79	44	16,400	327	171,405	215	51,393	464	18,212
Minnesota					37	17,485	17	3,740	471	12,760
Mississippi							4	517		
Missouri					5	6,500	12	2,180	123	3,385
New Hampshire	1	10	5	900			13	1,610	50	1,333
New Jersey	6	34	21	6,000	82	48,857	115	18,140	104	2,780
New York	15	248	121	56,975	552	454,643	337	74,189	1,756	125,870
North Carolina					1	318	6	680	2	30
Ohio					78	34,400	24	4,450	268	8,355
Oregon	2	15	9	1,400	4	6,040	12	985	26	2,000
Pennsylvania					*15*	*11,000*	91	13,176	289	22,860
Rhode Island	2	22	12	2,200	2	3,000	58	15,435	73	3,469
Tennessee									52	820
Texas	2	15	10	1,700			18	1,086		
Virginia					1	4,000	44	3,837	32	2,550
Washington					10	26,900	185	21,184	199	13,205
Wisconsin					241	89,780	108	17,160	581	10,861
All other states[2]					3	1,400	22	650	87	2,859

[1] Included under "steam vessels" in Tables 8 and 22.

[2] Includes Arkansas, Idaho, and Vermont.

Table 20 presents the number, gross and net tonnage, and value of steam launches, and the number and value of other power launches, small sailboats under 5 tons, and rowboats of all types. Gasoline engines were employed as a motive power in all but a small proportion of the launches using power other than steam. Both these and the steam launches varied widely in value. The average value of steam launches is shown to be considerably higher than the actual value of the greater proportion of those constructed. The same is true of boats propelled by oars, the average value being raised by the inclusion in this class of racing shells valued as high as $2,000, of metal lifeboats averaging $200 in value, and of a large number of hunting boats of expensive construction.

The detailed statistics for the industry as reported are shown in Tables 21, 22, and 23, Table 21 presenting statistics of iron and steel shipbuilding; Table 22, of wooden ship and boat building; and Table 23, of governmental establishments. These tables present separate totals for each state in which there were 3 or more establishments, and group the statistics for other states so as not to disclose the operations of individual establishments, except in Table 23, which shows separately the data reported by each establishment. The establishments are classified according to the character of the ownership, which shows that in iron and steel shipbuilding 4 were owned by individuals, 5 by partnerships, and 35 by corporations; and in wooden shipbuilding 744 were owned by individuals, 212 by partnerships, and 116 by corporations. The employees are classified so as to show for salaried officials, clerks, etc., and for wage-earners separately the number and salaries or wages of men, women, and children, respectively, and also the average number of wage-earners employed during each month of the year. Separate totals are shown for the different materials, presenting quantities when possible; and the kind, number, and value of the several types of vessels constructed, the amount received for repairing, and the value of all other products, are given. The number of engines, water wheels, electric motors, and other forms of power in use, with their horsepower, are shown. The establishments are grouped in the tables according to the number of employees in each.

TABLE 21.—SHIPBUILDING, IRON AND STEEL, BY STATES: 1900.

	United States.	Maryland.	Massachusetts.	Michigan.	New Jersey.	New York.	Pennsylvania.	All other states.[1]
Number of establishments	44	4	3	3	4	9	3	18
Character of organization:								
Individual	4	.....	.....	.....	2	2	.....	.....
Firm and limited partnership	5	1	1	.....	.....	2	.....	1
Incorporated company	35	3	2	3	2	5	3	17
Established during the decade	6	1	.....	3	.....	.....	.....	2
Established during the census year	1	.....	.....	1	.....	.....	.....	.....
Capital:								
Total	$59,839,555	$3,822,588	$1,010,461	$3,087,164	$2,015,863	$3,536,165	$13,858,081	$32,509,733
Land	$9,614,552	$103,000	$122,500	$703,115	$557,000	$1,273,066	$2,505,514	$4,350,357
Buildings	$10,925,216	$250,000	$167,388	$729,017	$189,500	$401,862	$4,551,982	$4,635,467
Machinery, tools, and implements	$12,085,016	$945,000	$445,898	$803,403	$414,436	$642,370	$2,042,882	$6,791,027
Cash and sundries	$27,214,771	$2,524,588	$274,675	$851,629	$854,427	$1,218,867	$4,757,703	$16,732,882
Proprietors and firm members	16	3	2	.....	1	7	.....	3
Salaried officials, clerks, etc.:								
Total number	857	70	29	41	54	74	148	441
Total salaries	$1,411,863	$85,122	$40,944	$50,020	$82,168	$110,673	$245,221	$797,715
Officers of corporations:								
Number	78	8	4	7	2	5	10	42
Salaries	$380,323	$27,400	$12,700	$19,000	$8,000	$22,020	$63,186	$228,017
General superintendents, managers, clerks, and salesmen:								
Total number	779	62	25	34	52	69	138	399
Total salaries	$1,031,540	$57,722	$28,244	$31,020	$74,168	$88,653	$182,035	$569,698
Men:								
Number	758	62	21	34	51	68	138	384
Salaries	$1,020,794	$57,722	$26,594	$31,020	$73,768	$88,133	$182,035	$561,522
Women:								
Number	21	.....	4	.....	1	1	.....	15
Salaries	$10,746	.....	$1,650	.....	$400	$520	.....	$8,176
Wage-earners, including pieceworkers, and total wages:								
Greatest number employed at any one time during the year	41,228	2,795	888	2,934	1,877	3,261	8,836	20,637
Least number employed at any one time during the year	23,059	1,351	361	938	1,134	1,389	5,477	12,409
Average number	30,906	1,939	563	1,796	1,458	2,108	6,820	16,222
Wages	$16,231,311	$1,185,832	$399,307	$869,366	$1,014,106	$1,167,171	$3,425,226	$8,170,303
Men, 16 years and over:								
Average number	29,940	1,904	563	1,796	1,429	2,100	6,347	15,801
Wages	$16,045,494	$1,178,297	$399,307	$869,366	$1,005,106	$1,164,415	$3,423,216	$8,105,787
Women, 16 years and over:								
Average number	17	1	.....	.....	.....	2	.....	14
Wages	$4,908	$482	.....	.....	.....	$936	.....	$3,490
Children, under 16 years:								
Average number	949	34	.....	.....	29	6	473	407
Wages	$180,909	$7,053	.....	.....	$9,000	$1,820	$102,010	$61,026
Average number of wage-earners, including pieceworkers, employed during each month:[2]								
Men, 16 years and over:								
January	29,842	1,795	409	1,677	1,469	2,080	6,293	16,119
February	30,163	1,869	443	1,834	1,546	2,041	6,664	15,766
March	31,470	2,402	570	2,108	1,505	1,953	7,039	15,893
April	33,209	2,441	608	2,396	1,519	2,693	7,631	15,921

[1] Includes establishments distributed as follows: California, 2; Delaware, 2; Florida, 1; Illinois, 1; Indiana, 1; Iowa, 1; Maine, 2; Ohio, 2; Oregon, 1; Rhode Island, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

[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 21.—SHIPBUILDING, IRON AND STEEL, BY STATES: 1900—Continued.

	United States.	Maryland.	Massachusetts.	Michigan	New Jersey.	New York	Pennsylvania	All other states.[1]
Average number of wage-earners, including piece-workers, employed during each month—Cont'd:[2]								
Men, 16 years and over—Continued:								
May	30,345	2,049	495	2,309	1,574	2,270	5,833	15,815
June	30,592	2,130	522	2,015	1,632	2,298	5,943	16,052
July	28,739	1,884	559	1,357	1,551	2,119	6,323	14,946
August	28,884	1,891	583	1,391	1,291	2,280	6,513	14,935
September	28,877	1,852	582	1,531	1,037	1,998	6,192	15,685
October	28,646	1,725	589	1,483	1,348	1,835	5,715	15,951
November	28,802	1,529	662	1,677	1,320	1,754	5,887	15,973
December	29,711	1,276	735	1,768	1,360	1,882	6,133	16,557
Miscellaneous expenses:								
Total	$2,642,690	$110,916	$97,982	$109,687	$251,092	$98,970	$591,535	$1,382,508
Rent of works	$93,990	$27,875	.....	$1,275	$29,520	$15,400	$2,500	$17,420
Taxes, not including internal revenue	$145,284	$12,716	$7,904	$15,699	$9,151	$23,934	$23,925	$51,955
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$1,287,554	$67,325	$82,328	$92,713	$87,421	$34,636	$286,774	$636,357
Contract work	$1,115,862	$3,000	$7,750	.....	$125,000	$25,000	$278,336	$676,776
Materials used:								
Total cost	$23,585,549	$1,497,554	$652,966	$1,654,348	$1,232,927	$1,233,338	$6,996,703	$10,317,713
Lumber, all kinds, including logs, timber, and knees, thousand feet, B. M	267,953	3,526	554	220,286	2,544	2,934	15,843	22,266
Cost	$1,341,113	$95,616	$14,884	$46,853	$78,751	$89,412	$390,042	$625,525
Pig and scrap iron, tons	22,639	405	.....	1,035	300	312	6,115	14,472
Cost	$395,091	$6,500	.....	$20,692	$5,400	$5,000	$100,742	$256,757
Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds	375,383,913	30,480,153	13,800,900	42,042,000	9,520,119	24,818,241	66,106,421	188,616,079
Cost	$11,878,297	$874,803	$482,866	$1,100,462	$511,122	$728,085	$3,442,416	$4,738,543
Anchors and chains purchased	$168,726	$25,465	.....	$21,326	$3,247	$11,751	$30,511	$76,426
Cordage:								
Wire, feet	633,175	39,406	2,700	32,365	115,231	19,148	75,962	348,363
Cost	$72,791	$5,294	$400	$4,968	$10,599	$1,488	$11,314	$38,428
Manila and hemp, pounds	973,283	24,804	1,800	54,775	109,864	51,883	94,169	635,988
Cost	$142,138	$3,382	$300	$6,977	$12,748	$6,074	$15,129	$97,533
Duck	$41,363	$2,271	$215	$740	$1,939	$3,350	$3,537	$29,311
Paints, oils, etc	$381,423	$19,404	$1,565	$7,035	$34,551	$23,864	$105,040	$189,964
Oakum and pitch	$33,697	$1,277	$160	$2,027	$1,709	$6,475	$1,866	$20,183
Masts and spars purchased	$40,018	$1,768	$60	.....	$5,333	$16,370	$5,809	$10,678
Blocks purchased	$32,527	$3,549	$30	.....	$2,605	$1,224	$10,768	$14,351
Machinery and boilers purchased	$2,315,161	$94,528	$93,566	$146,843	$207,520	$98,249	$590,139	$1,084,316
Fittings and furniture purchased	$694,024	$31,182	$7,569	$26,346	$170,463	$13,348	$15,106	$430,010
Fuel	$568,320	$38,161	$11,700	$25,701	$24,525	$16,965	$93,262	$358,006
Rent of power and heat	$16,156	.....	.....	.....	.....	$4,820	.....	$11,336
Mill supplies	$198,266	$8,205	$3,365	$5,480	$4,643	$2,248	$120,065	$54,260
All other materials	$4,712,846	$286,049	$33,751	$233,276	$136,871	$204,615	$2,031,045	$1,787,239
Freight	$553,592	$100	$2,535	$5,622	$20,576	.....	$29,912	$494,847
Products:								
Total value	$50,367,739	$3,299,491	$1,296,880	$3,029,203	$2,857,429	$3,223,654	$14,085,395	$22,575,687
Steel and iron vessels:								
Steam, number	123	14	3	8	10	14	22	52
Gross tonnage	237,379	15,173	1,600	34,327	3,426	7,582	84,698	90,573
Net tonnage	164,313	10,789	950	25,551	2,858	5,527	56,447	62,691
Value	$24,311,843	$1,789,542	$408,000	$2,105,500	$830,000	$860,650	$8,849,029	$9,468,622
Sailing, number	6	.....	.....	.....	.....	.....	.....	6
Gross tonnage	21,085	.....	.....	.....	.....	.....	.....	21,085
Net tonnage	18,348	.....	.....	.....	.....	.....	.....	18,348
Value	$962,600	.....	.....	.....	.....	.....	.....	$962,600
Barges, number	5	.....	.....	.....	1	3	.....	1
Gross tonnage	4,052	.....	.....	.....	500	3,502	.....	50
Net tonnage	3,848	.....	.....	.....	450	3,348	.....	50
Value	$181,000	.....	.....	.....	$40,000	$135,000	.....	$6,000
All other products	$12,609,836	$875,293	$95,000	$479,203	$1,139,112	$352,335	$2,680,782	$6,988,111
Amount received for repair work	$12,302,960	$634,656	$793,880	$444,500	$848,317	$1,876,669	$2,655,584	$5,150,354
Comparison of products:								
Number of establishments reporting for both years	41	4	3	2	4	9	3	16
Value for census year	$46,262,750	$3,299,491	$1,296,880	$2,429,203	$2,857,429	$3,223,654	$14,085,395	$19,070,698
Value for preceding business year	$25,222,512	$1,256,091	$761,555	$577,000	$1,575,437	$2,249,402	$8,905,763	$9,897,274
Power:								
Number of establishments reporting	43	4	3	3	4	8	3	18
Total horsepower	44,096	1,933	505	1,697	769	3,130	20,187	15,875
Owned:								
Engines:								
Steam, number	308	20	8	32	15	18	53	162
Horsepower	35,902	1,075	375	1,500	637	2,500	18,178	11,637
Gas or gasoline, number	3	.....	.....	1	.....	.....	.....	2
Horsepower	28	.....	.....	12	.....	.....	.....	16
Electric motors, number	395	37	10	3	31	4	73	237
Horsepower	5,234	863	130	80	82	200	1,039	3,340
Other power, horsepower	2,220	495	.....	105	50	.....	970	600
Rented:								
Electric, horsepower	52	.....	.....	.....	.....	.....	.....	52
Other kind, horsepower	660	.....	.....	.....	.....	430	.....	230
Establishments classified by number of persons employed, not including proprietors and firm members:								
Total number of establishments	44	4	3	3	4	9	3	18
51 to 100	2	.....	.....	.....	.....	1	.....	1
101 to 250	5	1	1	.....	.....	2	.....	1
251 to 500	15	1	1	.....	2	4	.....	7
501 to 1,000	13	1	1	2	2	2	1	4
Over 1,000	9	1	.....	1	.....	.....	2	5

[1] Includes establishments distributed as follows: California, 2; Delaware, 2; Florida, 1; Illinois, 1; Indiana, 1; Iowa, 1; Maine, 2; Ohio, 2; Oregon, 1; Rhode Island, 1; Virginia, 2; Washington, 1; Wisconsin, 1.

[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 22.—SHIP AND BOAT BUILDING,

		United States.	Alabama.	California.	Connecticut.	Delaware.	District of Columbia.
1	Number of establishments	1,072	6	39	35	9	3
	Character of organization:						
2	Individual	744	2	23	24	6	1
3	Firm and limited partnership	212	1	10	6	1	2
4	Incorporated company	116	3	6	5	2	.....
5	Established during the decade	400	3	17	10	3	.....
6	Established during the census year	51	.....	3	.....	2	.....
	Capital:						
7	Total	$17,523,146	$146,946	$298,990	$601,871	$224,726	$14,465
8	Land	$3,868,999	$24,750	$30,950	$121,900	$40,900	$11,500
9	Buildings	$2,182,156	$2,600	$38,170	$118,730	$14,350	$1,400
10	Machinery, tools, and implements	$3,893,070	$31,820	$92,360	$80,939	$36,850	$515
11	Cash and sundries	$7,578,921	$87,776	$137,510	$280,302	$132,626	$1,050
12	Proprietors and firm members	1,239	4	51	37	9	5
	Salaried officials, clerks, etc.:						
13	Total number	550	3	21	12	7	.....
14	Total salaries	$596,674	$4,300	$23,348	$14,012	$8,986	.....
	Officers of corporations:						
15	Number	104	1	5	3	4	.....
16	Salaries	$183,707	$2,000	$7,200	$2,212	$5,500	.....
	General superintendents, managers, clerks, and salesmen:						
17	Total number	446	2	16	9	3	.....
18	Total salaries	$412,967	$2,300	$16,148	$11,800	$3,436	.....
	Men:						
19	Number	413	2	16	9	3	.....
20	Salaries	$397,656	$2,300	$16,148	$11,800	$3,436	.....
	Women:						
21	Number	33	.....	.....	.....	.....	.....
22	Salaries	$15,311	.....	.....	.....	.....	.....
	Wage-earners, including pieceworkers, and total wages:						
23	Greatest number employed at any one time during the year	28,591	642	1,666	1,187	321	27
24	Least number employed at any one time during the year	9,668	52	448	697	144	10
25	Average number	15,875	293	885	915	207	17
26	Wages	$8,607,852	$101,526	$538,694	$451,086	$110,504	$11,480
	Men, 16 years and over:						
27	Average number	15,804	293	880	915	201	17
28	Wages	$8,591,118	$101,526	$537,060	$451,086	$109,464	$11,480
	Women, 16 years and over:						
29	Average number	17	.....	.....	.....	.....	.....
30	Wages	$6,516	.....	.....	.....	.....	.....
	Children, under 16 years:						
31	Average number	54	.....	5	.....	6	.....
32	Wages	$10,218	.....	$1,634	.....	$1,040	.....
	Average number of wage-earners, including pieceworkers, employed during each month:[1]						
	Men, 16 years and over:						
33	January	13,283	132	832	841	179	12
34	February	13,808	118	915	881	224	12
35	March	15,967	189	812	1,017	227	15
36	April	17,459	307	853	929	148	19
37	May	18,579	428	869	1,003	186	20
38	June	17,560	409	921	1,016	214	21
39	July	16,807	313	919	932	219	18
40	August	16,632	445	963	924	220	20
41	September	16,329	539	1,002	922	197	20
42	October	15,106	380	765	804	201	18
43	November	14,122	129	759	821	200	16
44	December	14,049	177	948	888	201	11
	Miscellaneous expenses:						
45	Total	$1,042,971	$6,022	$89,025	$13,529	$7,791	$154
46	Rent of works	$199,483	$2,350	$9,751	$3,227	$869	.....
47	Taxes, not including internal revenue	$92,184	$1,538	$1,548	$1,885	$557	$29
48	Rent of offices, insurance, interest, and all sundry expenses not hitherto included.	$508,944	$2,134	$67,226	$7,547	$6,007	$125
49	Contract work	$242,360	.....	$10,500	$870	$858	.....
	Materials used:						
50	Total cost	$9,901,223	$76,767	$702,319	$680,213	$153,361	$6,989
51	Lumber, all kinds, including logs, timber, and knees, thousand feet, B. M.	257,338	1,745	14,328	14,628	3,222	164
52	Cost	$4,890,728	$33,579	$352,559	$354,073	$98,065	$5,335
53	Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds.	36,277,031	285,973	1,468,486	3,062,140	912,180	20,200
54	Cost	$1,519,450	$8,837	$94,266	$78,351	$23,641	$1,308
55	Anchors and chains purchased	$152,830	$317	$17,625	$11,302	$1,985	$40
	Cordage:						
56	Wire, feet	914,656	340	46,439	17,695	9,250	.....
57	Cost	$93,301	$38	$4,534	$2,910	$860	.....
58	Manila and hemp, pounds	1,436,929	16,480	115,996	167,128	12,770	200
59	Cost	$228,686	$2,380	$18,076	$27,910	$1,598	$24
60	Duck	$136,503	$88	$19,030	$1,360	$1,931	.....
61	Paints, oils, etc.	$340,442	$4,282	$13,946	$23,099	$3,810	.....
62	Oakum and pitch	$241,955	$2,602	$12,274	$8,891	$2,860	$148
63	Masts and spars purchased	$188,588	$842	$9,144	$14,964	$5,145	.....
64	Blocks purchased	$52,785	$32	$2,784	$3,416	$975	.....
65	Machinery and boilers purchased	$767,816	$18,091	$69,580	$70,629	$20	.....
66	Fittings and furniture purchased	$114,492	$375	$6,614	$6,671	$260	.....
67	Fuel	$121,171	$185	$4,692	$5,783	$2,499	.....
68	Rent of power and heat	$16,011	$100	$450	$522	$75	.....
69	Mill supplies	$27,662	$75	$1,384	$1,549	$392	.....
70	All other materials	$893,076	$4,365	$69,488	$62,745	$8,055	$134
71	Freight	$125,882	$579	$5,923	$6,038	$1,190	.....

[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.

WOODEN, BY STATES: 1900.

Florida.	Georgia	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	
15	4	17	14	10	10	15	115	43	122	51	1
11	2	11	10	7	5	6	90	27	85	39	2
2	.....	3	3	1	3	3	20	13	28	6	3
2	2	3	1	2	2	6	5	3	9	6	4
9	2	5	6	5	6	7	31	18	35	20	5
1	1	.....	1	.....	.....	.....	3	1	2	5	6
$149,159	$15,170	$363,006	$350,907	$28,996	$60,377	$212,643	$1,315,820	$623,435	$1,138,830	$805,855	7
$8,550	.....	$149,817	$27,501	$8,400	$12,100	$125,850	$106,500	$197,750	$221,539	$149,965	8
$9,600	.....	$74,975	$19,855	$5,625	$8,300	$19,100	$91,975	$51,525	$129,878	$252,956	9
$45,992	$770	$22,745	$25,351	$6,200	$12,075	$35,814	$125,620	$150,994	$201,104	$118,545	10
$85,017	$14,400	$115,469	$278,200	$8,771	$27,902	$31,879	$991,825	$220,166	$586,309	$284,389	11
15	2	19	16	9	14	10	150	58	141	53	12
3	2	13	9	7	6	23	28	25	51	32	13
$3,150	$1,400	$46,550	$8,020	$1,700	$3,785	$15,232	$23,326	$20,320	$38,102	$26,368	14
.....	.....	4	2	1	2	2	4	4	12	7	15
.....	.....	$22,500	$2,380	$1,200	$500	$1,900	$6,900	$3,880	$11,562	$5,500	16
3	2	9	7	6	4	21	24	21	39	25	17
$3,150	$1,400	$24,050	$5,640	$3,500	$3,285	$13,332	$16,426	$16,440	$26,540	$20,868	18
3	2	9	5	6	2	21	23	21	32	22	19
$3,150	$1,400	$24,050	$4,200	$3,500	$900	$13,332	$16,166	$16,440	$28,750	$19,840	20
.....	.....	.....	2	.....	2	.....	1	.....	7	3	21
.....	.....	.....	$1,440	.....	$2,385	.....	$260	.....	$2,790	$1,028	22
197	62	658	546	125	195	398	2,401	1,089	1,821	1,981	23
79	13	101	82	23	45	109	861	360	637	975	24
141	19	311	343	38	104	247	1,369	676	1,043	1,120	25
$73,509	$5,156	$159,158	$160,379	$13,480	$48,090	$105,196	$749,567	$331,873	$636,686	$474,521	26
141	19	311	343	38	104	247	1,369	675	1,043	1,116	27
$73,509	$5,156	$159,158	$160,379	$13,480	$48,090	$105,196	$749,567	$331,707	$636,686	$473,291	28
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$1,230	30
.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	31
.....	.....	.....	.....	.....	.....	.....	.....	$166	.....	.....	32
139	10	406	193	31	76	181	952	430	968	1,114	33
137	19	408	187	40	63	194	70	482	870	1,195	34
143	9	340	254	53	59	251	1,143	562	1,078	1,206	35
146	9	328	271	98	100	212	1,417	766	1,218	1,294	36
147	39	303	343	68	105	237	1,558	804	1,387	1,271	37
147	30	292	413	26	82	268	1,513	833	1,299	1,138	38
157	30	316	476	23	120	293	1,522	801	1,040	1,123	39
145	30	295	447	25	140	299	1,543	774	908	1,081	40
128	22	262	434	19	160	270	1,542	804	963	1,120	41
129	10	245	413	26	146	271	1,541	715	961	970	42
139	10	168	365	27	114	277	1,452	642	941	952	43
139	10	376	317	20	82	215	1,277	492	882	928	44
$7,185	$680	$11,526	$41,261	$1,180	$7,804	$9,732	$65,463	$30,649	$133,787	$99,868	45
$1,195	$10	$3,622	$85	$315	$245	$2,127	$6,936	$5,225	$21,453	$16,463	46
$439	$25	$3,067	$1,132	$228	$564	$2,372	$4,705	$7,651	$6,772	$1,058	47
$5,551	$300	$4,785	$40,044	$637	$6,199	$5,233	$18,051	$16,793	$40,861	$5,434	48
.....	$345	$52	.....	.....	$796	.....	$35,771	$980	$64,701	$36,913	49
$111,111	$12,650	$83,246	$195,243	$13,207	$20,775	$71,621	$1,377,769	$301,010	$704,439	$543,535	50
1,950	158	1,345	36,164	135	347	2,281	30,682	6,370	11,834	7,209	51
$41,862	$2,985	$38,243	$83,847	$4,986	$8,662	$41,780	$742,280	$176,052	$334,314	$227,642	52
528,206	91,800	195,822	177,180	18,670	32,650	158,000	4,691,615	652,939	3,811,803	966,975	53
$48,285	$974	$7,746	$28,712	$1,640	$2,893	$12,274	$150,169	$41,253	$122,710	$67,320	54
$589	$222	$100	$5	$10	$80	$841	$57,840	$3,415	$7,289	$11,190	55
8,300	825	3,600	.....	100	.....	.....	269,010	12,940	81,150	47,255	56
$1,250	$35	$230	.....	$9	.....	.....	$28,111	$2,158	$7,226	$5,159	57
5,788	2,190	16,606	3,028	600	2,590	2,566	373,158	23,230	153,376	101,770	58
$960	$354	$1,205	$336	$83	$430	$827	$54,422	$4,243	$24,131	$16,663	59
$372	$431	$4,576	$1,617	$30	$65	$63	$34,962	$2,166	$9,247	$4,215	60
$4,635	$363	$3,118	$22,437	$276	$520	$1,790	$21,567	$15,410	$23,231	$11,682	61
$1,490	$197	$4,230	$4,937	$293	$3,068	$2,802	$24,324	$9,341	$12,022	$11,750	62
$695	$18	$6,802	$49	.....	$45	$800	$44,882	$15,035	$11,468	$2,659	63
$212	$183	$250	$24	.....	$10	$205	$16,120	$1,182	$5,709	$1,351	64
.....	$4,500	$4,800	$35,460	$3,750	$2,000	$400	$102,364	$1,500	$41,327	$109,729	65
$95	$1,450	$1,700	$345	$110	.....	$69	$13,909	$490	$16,838	$11,778	66
$415	.....	$1,981	$1,271	$604	$699	$2,670	$4,295	$4,066	$10,252	$4,559	67
.....	.....	$261	.....	.....	.....	.....	$2,723	.....	$3,252	$200	68
$277	$248	$179	$423	$231	$141	$582	$1,923	$1,679	$2,635	$1,682	69
$9,557	$440	$6,892	$11,652	$425	$1,837	$6,377	$51,067	$15,016	$65,407	$46,170	70
$417	$250	$1,433	$4,128	$760	$325	$646	$26,811	$8,004	$7,881	$9,786	71

TABLE 22.—SHIP AND BOAT BUILDING,

		Minnesota.	Mississippi.	Missouri.	New Hampshire.	New Jersey.	New York.	North Carolina.
1	Number of establishments	25	13	10	6	64	218	14
	Character of organization:							
2	Individual	19	11	6	6	42	160	12
3	Firm and limited partnership	4	1	2	.....	8	44	2
4	Incorporated company	2	1	2	.....	14	14	.....
5	Established during the decade	10	7	8	1	23	76	8
6	Established during the census year	1	.....	2	.....	5	11	.....
	Capital:							
7	Total	$161,967	$54,885	$25,930	$10,585	$1,670,969	$6,138,915	$73,760
8	Land	$24,050	$4,850	$1,901	$1,500	$178,054	$1,674,472	$21,600
9	Buildings	$29,975	$11,850	$2,625	$2,000	$210,227	$646,208	$2,700
10	Machinery, tools, and implements	$44,732	$16,705	$7,627	$1,725	$616,894	$1,373,036	$22,185
11	Cash and sundries	$63,210	$21,480	$13,777	$5,360	$665,794	$2,444,604	$27,275
12	Proprietors and firm members	28	13	12	6	60	268	17
	Salaried officials, clerks, etc.:							
13	Total number	7	5	3	.....	69	123	2
14	Total salaries	$7,580	$4,500	$3,070	.....	$75,859	$154,676	$1,200
	Officers of corporations:							
15	Number	.....	3	.....	.....	16	12	.....
16	Salaries	.....	$2,000	.....	.....	$30,350	$37,508	.....
	General superintendents, managers, clerks, and salesmen:							
17	Total number	7	2	3	.....	53	111	2
18	Total salaries	$7,580	$2,500	$3,070	.....	$45,509	$117,168	$1,200
	Men:							
19	Number	7	2	2	.....	49	104	2
20	Salaries	$7,580	$2,500	$2,680	.....	$44,095	$113,109	$1,200
	Women:							
21	Number	.....	.....	1	.....	4	7	.....
22	Salaries	.....	.....	$390	.....	$1,414	$4,059	.....
	Wage earners, including pieceworkers, and total wages:							
23	Greatest number employed at any one time during the year	358	162	129	9	2,043	6,589	178
24	Least number employed at any one time during the year	87	40	43	5	887	2,242	44
25	Average number	137	73	66	5	1,416	3,464	73
26	Wages	$74,817	$46,452	$45,909	$3,600	$778,103	$2,014,788	$34,782
	Men, 16 years and over:							
27	Average number	137	73	66	5	1,416	3,426	73
28	Wages	$74,817	$46,452	$45,909	$3,600	$778,103	$2,006,374	$34,782
	Women, 16 years and over:							
29	Average number	.....	.....	.....	.....	.....	9	.....
30	Wages	.....	.....	.....	.....	.....	$4,136	.....
	Children, under 16 years:							
31	Average number	.....	.....	.....	.....	.....	29	.....
32	Wages	.....	.....	.....	.....	.....	$4,278	.....
	Average number of wage-earners, including pieceworkers, employed during each month:							
	Men, 16 years and over:							
33	January	102	56	52	4	1,130	3,114	65
34	February	107	50	41	5	1,137	3,298	74
35	March	188	65	91	6	1,316	3,727	87
36	April	268	82	82	7	1,401	4,250	89
37	May	200	84	77	8	1,575	4,274	81
38	June	163	75	61	6	1,474	3,948	79
39	July	125	65	92	5	1,503	3,520	85
40	August	102	79	79	5	1,482	3,264	82
41	September	92	68	68	5	1,518	3,113	82
42	October	106	91	71	4	1,594	2,983	56
43	November	96	88	49	4	1,548	2,776	53
44	December	93	74	32	4	1,314	2,842	48
	Miscellaneous expenses:							
45	Total	$11,401	$1,829	$6,342	$368	$116,985	$210,445	$2,504
46	Rent of works	$2,485	$319	$2,880	$110	$39,040	$70,095	$1,520
47	Taxes, not including internal revenue	$1,529	$260	$82	$41	$6,144	$23,043	$454
48	Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$2,572	$840	$3,230	$217	$60,564	$101,752	$530
49	Contract work	$4,815	$410	$150	.....	$11,187	$15,555	.....
	Materials used:							
50	Total cost	$84,962	$46,376	$31,914	$2,625	$716,592	$1,882,659	$21,253
51	Lumber, all kinds, including logs, timber, and knees, thousand feet, B. M.	1,195	950	441	44	12,238	73,356	399
52	Cost	$31,006	$25,252	$16,576	$1,420	$352,717	$976,362	$12,737
53	Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds	219,847	118,950	106,350	3,650	3,504,712	7,621,589	59,495
54	Cost	$13,996	$4,988	$4,293	$300	$107,286	$331,441	$3,927
55	Anchors and chains purchased	$430	$464	$26	$15	$4,319	$5,106	$328
	Cordage:							
56	Wire, feet	7,075	2,475	280	.....	20,115	191,985	420
57	Cost	$1,046	$185	$26	.....	$1,823	$14,111	$26
58	Manila and hemp, pounds	6,106	4,080	950	540	32,006	140,496	1,875
59	Cost	$1,006	$718	$180	$90	$4,747	$21,591	$224
60	Duck	$526	$1,188	$118	.....	$3,342	$18,378	$253
61	Paints, oils, etc	$2,688	$1,111	$656	$250	$49,954	$80,147	$1,397
62	Oakum and pitch	$1,794	$1,688	$1,237	$18	$25,574	$54,244	$1,000
63	Masts and spars purchased	$153	$944	$12	$40	$7,386	$40,155	$515
64	Blocks purchased	$203	$168	.....	$20	$2,657	$5,577	$124
65	Machinery and boilers purchased	$16,990	$1,400	$3,375	.....	$30,160	$66,634	.....
66	Fittings and furniture purchased	$2,453	$90	$195	$20	$6,590	$17,478	.....
67	Fuel	$2,076	$1,294	$830	$150	$10,641	$28,514	$350
68	Rent of power and heat	$590	.....	.....	.....	$1,023	$6,299	.....
69	Mill supplies	$332	$264	$65	$10	$2,286	$6,288	$35
70	All other materials	$7,498	$5,839	$4,205	$237	$96,795	$194,952	$295
71	Freight	$2,175	$883	$120	$55	$9,292	$20,387	$42

WOODEN, BY STATES: 1900—Continued.

Ohio.	Oregon.	Pennsylvania.	Rhode Island.	Tennessee.	Texas.	Virginia.	Washington.	West Virginia.	Wisconsin.	All other states.[1]	
31	16	35	20	3	7	27	36	4	29	6	1
18	10	23	15	3	4	18	23	1	20	4	2
9	3	8	2	.....	3	8	7	1	6	2	3
4	3	4	3	.....	.....	1	6	2	3	.....	4
11	11	7	6	2	3	12	23	2	11	2	5
1	2	1	1	.....	.....	.....	7	.....	1	.....	6
$283,940	$126,845	$283,401	$540,847	$1,020	$10,930	$320,982	$548,084	$46,455	$892,225	$40,210	7
$90,050	$23,750	$58,550	$50,850	.....	$270	$131,270	$106,660	$2,000	$258,700	$7,500	8
$35,880	$6,200	$59,450	$98,917	.....	$2,850	$27,240	$80,200	$4,000	$111,000	$8,800	9
$52,785	$39,770	$44,790	$164,567	$320	$2,385	$121,150	$110,875	$19,200	$250,670	$16,010	10
$105,225	$57,125	$120,611	$226,513	$700	$5,475	$41,322	$250,849	$21,255	$216,855	$7,900	11
37	15	41	19	3	10	35	39	4	31	8	12
14	8	13	8	.....	.....	10	22	4	20	.....	13
$9,445	$10,460	$8,680	$20,440	.....	.....	$10,100	$27,572	$1,575	$19,968	.....	14
2	3	.....	6	.....	.....	.....	3	4	4	.....	15
$1,800	$3,600	.....	$18,840	.....	.....	.....	$6,000	$1,575	$8,800	.....	16
12	5	13	2	.....	.....	10	19	.....	16	.....	17
$7,645	$6,860	$8,680	$1,600	.....	.....	$10,100	$21,572	.....	$11,168	.....	18
11	5	12	2	.....	.....	10	19	.....	12	.....	19
$7,420	$6,860	$8,560	$1,600	.....	.....	$10,100	$21,572	.....	$9,968	.....	20
1	.....	1	.....	.....	.....	.....	.....	.....	4	.....	21
$225	.....	$120	.....	.....	.....	.....	.....	.....	$1,200	.....	22
743	662	527	430	65	68	362	1,926	102	927	95	23
148	212	231	204	65	16	88	336	27	351	11	24
368	338	257	299	11	33	187	741	53	562	64	25
$161,123	$187,357	$119,719	$210,009	$2,560	$19,815	$97,681	$510,301	$20,204	$282,567	$27,710	26
368	338	252	299	11	33	187	732	53	559	64	27
$161,123	$187,357	$118,619	$210,009	$2,560	$19,815	$97,681	$508,051	$20,204	$281,667	$27,710	28
.....	.....	1	.....	.....	.....	.....	.....	.....	3	.....	29
.....	.....	$250	.....	.....	.....	.....	.....	.....	$900	.....	30
.....	.....	4	.....	.....	.....	.....	9	.....	.....	.....	31
.....	.....	$850	.....	.....	.....	.....	$2,250	.....	.....	.....	32
211	306	186	209	65	61	124	399	32	584	42	33
251	310	166	235	65	42	125	519	25	601	42	34
360	356	224	299	.....	43	158	1,014	28	642	60	35
396	279	240	368	.....	44	179	900	40	655	69	36
388	346	255	358	.....	47	232	1,011	49	760	76	37
342	330	347	350	.....	25	266	743	62	591	76	38
425	326	332	334	.....	24	224	780	70	519	76	39
458	355	332	327	.....	17	230	902	86	486	87	40
455	423	340	298	.....	11	241	643	89	414	75	41
415	316	219	265	.....	22	166	592	81	464	66	42
366	313	191	273	.....	20	105	627	46	449	46	43
352	394	186	278	.....	40	143	651	33	557	50	44
$23,908	$8,351	$38,628	$7,821	$339	$1,150	$10,582	$32,415	$1,780	$42,119	$698	45
$3,360	$1,865	$3,223	$2,226	$14	$841	$942	$4,379	$593	$1,653	$65	46
$1,704	$1,652	$2,261	$1,421	.....	$9	$1,219	$2,317	$288	$5,787	$413	47
$6,994	$3,503	$3,537	$3,874	$25	.....	$8,421	$20,265	$899	$24,674	$120	48
$11,850	$1,331	$29,617	$300	.....	$300	.....	$5,454	.....	$10,005	$100	49
$202,516	$306,579	$176,498	$229,496	$3,710	$90,845	$72,418	$735,050	$19,354	$212,680	$11,441	50
3,994	6,142	4,608	3,066	83	345	912	12,636	539	3,529	299	51
$147,879	$127,113	$116,138	$90,085	$1,270	$42,959	$21,758	$266,285	$13,423	$94,024	$7,460	52
629,367	882,462	802,525	464,700	2,700	63,150	750,385	2,591,075	39,500	1,381,915	10,070	53
$21,376	$43,868	$27,265	$40,554	$150	$1,473	$20,546	$158,153	$2,722	$46,108	$625	54
$179	$5,872	$197	$2,468	$300	$55	$2,300	$17,448	.....	$328	$150	55
4,850	18,892	15,050	68,600	110	.....	1,570	85,455	575	800	.....	56
$599	$2,666	$1,505	$8,359	$13	.....	$175	$10,027	$60	$100	.....	57
18,850	42,216	53,070	23,825	400	7,200	4,560	100,319	300	7,560	.....	58
$2,308	$7,021	$8,965	$3,584	$45	$1,240	$733	$16,787	$50	$1,260	.....	59
$1,874	$3,824	$400	$16,598	$67	$35	$450	$9,582	$5	$4,810	.....	60
$3,980	$11,151	$3,297	$9,725	$250	$703	$5,999	$11,517	$109	$6,609	$733	61
$6,471	$8,516	$6,808	$451	$60	$565	$3,649	$16,121	$2,025	$9,855	$650	62
$30	$2,810	$220	$7,079	.....	$70	$8,245	$7,622	.....	$754	.....	63
$63	$1,606	$179	$4,231	.....	$165	$213	$4,677	.....	$374	$30	64
$3,694	$51,400	$300	$1,000	$1,400	$40,000	$2,500	$71,728	.....	$12,735	$350	65
$1,656	$11,318	$1,300	$645	$25	$1,000	$775	$7,878	.....	$2,720	$150	66
$2,834	$1,430	$2,204	$4,760	.....	$50	$4,702	$6,286	$170	$10,799	$110	67
$203	$35	$168	.....	.....	.....	.....	$90	.....	$20	.....	68
$718	$382	$431	$750	.....	.....	$543	$656	$78	$1,291	$33	69
$5,086	$26,447	$5,786	$37,609	$100	$2,530	$3,620	$126,016	$531	$15,403	$1,050	70
$3,571	$1,120	$1,275	$1,598	$30	.....	$1,210	$4,227	$181	$5,495	$100	71

TABLE 22.—SHIP AND BOAT BUILDING,

		United States.	Alabama.	California.	Connecticut.	Delaware.	District of Columbia.
	Products:						
72	Total value	$24,210,419	$240,242	$1,654,108	$1,227,120	$360,117	$24,980
	Wooden vessels:						
73	Steam, number	396	3	28	25	3	.....
74	Gross tonnage	48,932	326	3,922	1,102	443	.....
75	Net tonnage	32,845	220	2,632	980	233	.....
76	Value	$2,994,358	$28,600	$280,486	$41,425	$23,008	.....
77	Sailing, number	646	1	22	14	3	.....
78	Gross tonnage	59,291	6	8,256	188	1,600	.....
79	Net tonnage	51,847	6	7,530	180	1,143	.....
80	Value	$3,251,069	$700	$560,860	$18,500	$47,000	.....
81	Barges, number	839	4	35	31	22	3
82	Gross tonnage	295,508	3,669	6,726	18,746	10,125	360
83	Net tonnage	251,089	1,859	5,890	17,089	9,457	800
84	Value	$3,828,170	$66,250	$141,750	$534,600	$190,456	$7,980
85	Canal boats, number	72	.....	.....	4	.....	.....
86	Gross tonnage	21,434	.....	.....	3,240	.....	.....
87	Net tonnage	19,949	.....	.....	3,240	.....	.....
88	Value	$227,374	.....	.....	$64,000	.....	.....
89	Small boats, launches and ships; fishing, pleasure, life, and row boats, etc., number.	15,448	.....	597	318	295	7
90	Value	$1,972,825	.....	$100,015	$72,107	$29,142	$500
91	All other products	$1,070,297	.....	$87,980	$185,872	$4,961	.....
92	Amount received for repair work	$10,866,326	$144,692	$483,017	$310,616	$65,550	$16,500
	Comparison of products:						
93	Number of establishments reporting for both years	898	4	35	32	8	2
94	Value for census year	$21,643,485	$161,066	$1,627,728	$1,196,070	$358,467	$26,980
95	Value for preceding business year	$17,886,228	$129,275	$1,375,347	$859,997	$235,922	$23,000
	Power:						
96	Number of establishments reporting	382	3	16	15	6	.....
97	Total horsepower	23,903	156	918	814	176	.....
	Owned:						
	Engines:						
98	Steam, number	496	3	11	25	8	.....
99	Horsepower	19,997	146	458	720	170	.....
100	Gas or gasoline, number	45	.....	9	3	.....	.....
101	Horsepower	617	.....	312	12	.....	.....
102	Water wheels, number	10	.....	.....	2	.....	.....
103	Horsepower	1,700	.....	.....	16	.....	.....
104	Electric motors, number	33	.....	.....	2	.....	.....
105	Horsepower	968	.....	.....	26	.....	.....
106	Other power, horsepower	55	.....	3	.....	.....	.....
	Rented:						
107	Electric, horsepower	149	.....	20	40	.....	.....
108	Other kind, horsepower	417	10	125	.....	6	.....
109	Horsepower furnished to other establishments	127	.....	10	.....	.....	.....
	Establishments classified by number of persons employed, not including proprietors and firm members:						
110	Total number of establishments	1,072	6	39	35	9	3
111	Number of employees	198	.....	4	4	.....	.....
112	Under 5	211	1	6	11	3	1
113	5 to 20	361	1	15	10	2	2
114	21 to 50	152	1	6	7	2	.....
115	51 to 100	81	2	3	1	1	.....
116	101 to 250	51	.....	4	1	1	.....
117	251 to 500	14	1	1	.....	.....	.....
118	501 to 1,000	4	.....	.....	1	.....	.....

WOODEN, BY STATES: 1900—Continued.

Florida.	Georgia.	Illinois.	Indiana.	Iowa.	Kentucky.	Louisiana.	Maine.	Maryland.	Massachusetts.	Michigan.	
$254,991	$23,500	$322,446	$465,207	$42,665	$97,492	$250,307	$2,491,765	$862,034	$1,760,574	$1,402,898	72
3	3	11	20	6	4	7	14	9	16	17	73
68	525	198	10,159	454	242	1,040	1,212	1,701	1,474	4,710	74
39	405	124	5,723	277	242	747	946	582	864	4,039	75
$10,900	$22,300	$12,800	$277,123	$16,650	$10,223	$17,582	$85,340	$69,775	$158,275	$301,400	76
6	1	8	.....	.....	5	1	73	24	128	13	77
522	15	40	.....	.....	220	15	26,683	456	3,889	2,884	78
394	12	36	.....	.....	194	10	23,753	295	2,910	2,793	79
$42,685	$600	$8,600	.....	.....	$3,450	$275	$1,087,701	$23,891	$384,000	$117,250	80
26	1	2	41	3	2	20	34	29	9	2	81
1,888	100	60	21,500	193	560	3,210	25,286	12,027	2,030	1,225	82
1,708	100	52	10,388	171	500	2,686	22,751	10,911	798	1,015	83
$41,751	$600	$250	$97,056	$900	$2,800	$56,425	$764,875	$159,820	$36,800	$60,550	84
.....	.....	1	.....	.....	.....	.....	.....	6	.....	.....	85
.....	.....	100	.....	.....	.....	.....	.....	920	.....	.....	86
.....	.....	75	.....	.....	.....	.....	.....	920	.....	.....	87
.....	.....	$1,600	.....	.....	.....	.....	.....	$6,800	.....	.....	88
97	.....	361	524	40	45	38	1,900	274	3,801	996	89
$20,671	.....	$20,898	$47,140	$4,249	$800	$1,935	$93,571	$35,354	$208,964	$241,010	90
$5,000	.....	$6,700	.....	.....	$987	$10,921	$37,974	$17,780	$162,699	$99,265	91
$133,984	.....	$271,598	$43,888	$20,866	$79,232	$163,169	$422,301	$538,614	$809,836	$583,423	92
14	1	15	6	9	5	13	102	35	116	40	93
$253,815	$600	$305,996	$415,707	$41,740	$69,727	$225,557	$2,311,313	$784,493	$1,657,349	$1,180,455	94
$133,205	$500	$285,488	$528,762	$37,874	$42,310	$186,863	$1,576,250	$635,520	$1,244,606	$949,683	95
2	.....	5	5	6	2	7	22	17	40	21	96
845	.....	221	338	116	206	427	612	600	736	1,855	97
12	.....	6	11	4	2	13	19	24	34	25	98
845	.....	215	242	96	200	427	466	562	619	1,741	99
.....	.....	1	1	2	1	.....	1	3	2	3	100
.....	.....	6	6	20	6	.....	16	38	36	34	101
.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	102
.....	.....	.....	80	.....	.....	.....	.....	.....	.....	65	103
.....	.....	.....	1	.....	.....	.....	1	.....	2	2	104
.....	.....	.....	10	.....	.....	.....	8	.....	6	15	105
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	106
.....	.....	.....	.....	.....	.....	.....	.....	.....	74	.....	107
.....	.....	.....	.....	.....	.....	.....	122	.....	1	.....	108
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35	109
15	4	17	14	10	10	15	115	43	122	51	110
4	1	3	3	1	1	.....	43	3	28	10	111
5	.....	4	5	5	3	1	17	5	20	13	112
4	2	3	2	2	4	7	30	22	54	10	113
1	1	4	2	1	1	4	11	6	11	8	114
.....	.....	.....	.....	1	.....	2	7	5	7	6	115
1	.....	3	1	.....	1	.....	5	2	1	2	116
.....	.....	.....	1	.....	.....	1	1	.....	1	1	117
.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1	118

TABLE 22.—SHIP AND BOAT BUILDING,

		Minnesota.	Mississippi.	Missouri.	New Hampshire.	New Jersey.	New York.	North Carolina.
	Products:							
72	Total value	$223,971	$115,744	$93,367	$9,793	$1,958,041	$5,423,717	$77,528
	Wooden vessels:							
73	Steam, number	11	25	2	1	10	87	2
74	Gross tonnage	627	534	84	10	581	4,817	214
75	Net tonnage	448	306	53	5	405	2,874	183
76	Value	$41,750	$31,700	$6,210	$900	$55,605	$535,252	$4,200
77	Sailing, number	15	14	2	.....	80	85	9
78	Gross tonnage	176	193	48	.....	357	1,400	142
79	Net tonnage	158	140	48	.....	240	1,150	109
80	Value	$11,085	$12,800	$600	.....	$25,695	$139,697	$6,225
81	Barges, number	5	8	8	.....	40	172	.....
82	Gross tonnage	664	1,150	956	.....	42,487	62,100	.....
83	Net tonnage	659	946	852	.....	37,328	47,848	.....
84	Value	$32,429	$22,310	$9,632	.....	$346,606	$873,664	.....
85	Canal boats, number	.....	.....	.....	.....	24	32	.....
86	Gross tonnage	.....	.....	.....	.....	9,815	6,909	.....
87	Net tonnage	.....	.....	.....	.....	9,805	5,499	.....
88	Value	.....	.....	.....	.....	$67,674	$82,850	.....
89	Small boats, launches and ships', fishing, pleasure, life, and row boats, etc., number.	525	4	140	63	301	2,645	9
90	Value	$33,975	$517	$12,065	$2,943	$69,777	$654,702	$1,028
91	All other products	$26,135	$6,000	$503	$150	$6,520	$155,305	$140
92	Amount received for repair work	$78,597	$42,417	$64,457	$6,800	$1,381,164	$2,982,247	$65,935
	Comparison of products:							
93	Number of establishments reporting for both years	21	11	6	5	53	190	11
94	Value for census year	$214,186	$83,944	$74,752	$8,750	$1,834,081	$4,821,975	$75,703
95	Value for preceding business year	$268,235	$49,875	$73,817	$8,175	$1,478,895	$4,068,740	$55,336
	Power:							
96	Number of establishments reporting	11	6	2	1	28	82	4
97	Total horsepower	180	197	142	15	2,152	7,444	156
	Owned:							
	Engines:							
98	Steam, number	10	6	3	1	63	98	5
99	Horsepower	138	182	142	15	2,094	5,714	156
100	Gas or gasoline, number	2	1	.....	.....	3	8	.....
101	Horsepower	18	15	.....	.....	24	45	.....
102	Water wheels, number	.....	.....	.....	.....	.....	6	.....
103	Horsepower	.....	.....	.....	.....	.....	1,589	.....
104	Electric motors, number	2	.....	.....	.....	.....	.....	.....
105	Horsepower	4	.....	.....	.....	.....	.....	.....
106	Other power, horsepower	.....	.....	.....	.....	.....	52	.....
	Rented:							
107	Electric, horsepower	.....	.....	.....	.....	.....	.....	.....
108	Other kind, horsepower	20	.....	.....	.....	34	94	.....
109	Horsepower furnished to other establishments	2	.....	.....	.....	20	60	.....
	Establishments classified by number of persons employed, not including proprietors and firm members:							
110	Total number of establishments	25	13	10	6	64	218	14
111	Number of employees	5	.....	2	2	11	45	.....
112	Under 5	7	2	2	4	14	86	4
113	5 to 20	8	9	4	.....	20	71	8
114	21 to 50	3	2	1	.....	3	33	2
115	51 to 100	1	.....	1	.....	10	18	.....
116	101 to 250	1	.....	.....	.....	5	12	.....
117	251 to 500	.....	.....	.....	.....	1	2	.....
118	501 to 1,000	.....	.....	.....	.....	.....	1	.....

WOODEN, BY STATES: 1900—Continued.

Ohio.	Oregon.	Pennsylvania.	Rhode Island.	Tennessee.	Texas.	Virginia.	Washington.	West Virginia.	Wisconsin.	All other states.[1]	
$485,581	$654,385	$407,763	$555,827	$8,097	$126,446	$263,802	$1,505,649	$51,170	$707,955	$66,137	72
15	16	5	10	2	4	2	21	1	12	1	73
1,262	4,899	875	93	114	325	104	6,298	78	382	59	74
893	3,293	522	56	76	268	63	4,953	58	298	38	75
$76,177	$266,328	$41,950	$40,700	$7,052	$105,200	$4,400	$363,187	$4,200	$51,410	$2,250	76
2	1	9	35	.....	2	61	30	.....	.....	2	77
50	1,443	76	414	.....	17	1,220	8,963	.....	.....	18	78
34	1,353	58	374	.....	16	920	7,975	.....	.....	16	79
$1,750	$50,000	$15,850	$191,650	.....	$1,100	$3,200	$495,425	.....	.....	$580	80
36	5	174	.....	.....	2	4	116	1	2	2	81
9,640	517	65,880	.....	.....	450	400	2,478	600	419	62	82
8,610	486	65,328	.....	.....	400	360	2,183	535	417	62	83
$120,000	$5,290	$125,060	.....	.....	$12,000	$4,000	$76,916	$1,300	$26,300	$800	84
2	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	85
150	.....	300	.....	.....	.....	.....	.....	.....	.....	.....	86
150	.....	260	.....	.....	.....	.....	.....	.....	.....	.....	87
$2,200	.....	$2,250	.....	.....	.....	.....	.....	.....	.....	.....	88
370	42	395	138	52	18	77	394	.....	880	112	89
$47,205	$9,025	$47,036	$21,904	$820	$1,086	$10,387	$61,289	.....	$117,801	$4,909	90
$11,200	$15,080	$14,992	$106,014	.....	$1,400	$15,000	$79,900	.....	$11,819	.....	91
$227,049	$308,662	$160,625	$195,559	$225	$5,660	$226,815	$429,932	$45,670	$500,625	$57,598	92
25	11	30	19	1	5	23	17	4	23	6	93
$417,681	$478,928	$367,349	$555,193	$1,000	$125,250	$255,502	$908,677	$51,170	$685,794	$66,537	94
$391,284	$364,623	$304,857	$435,077	$1,000	$76,950	$242,635	$625,227	$45,518	$594,182	$57,700	95
15	2	10	9	.....	.....	14	14	2	13	2	96
553	90	218	437	.....	.....	1,579	1,408	72	1,170	70	97
19	1	11	15	.....	.....	19	18	3	25	2	98
543	75	209	437	.....	.....	734	1,371	72	1,138	70	99
1	.....	2	.....	.....	.....	.....	1	.....	1	.....	100
10	.....	9	.....	.....	.....	.....	2	.....	8	.....	101
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	102
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	103
.....	.....	.....	.....	.....	.....	21	1	.....	1	.....	104
.....	.....	.....	.....	.....	.....	845	30	.....	24	.....	105
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	106
.....	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	107
.....	.....	.....	.....	.....	.....	.....	5	.....	.....	.....	108
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	109
31	16	35	20	3	7	27	36	4	29	6	110
5	.....	5	2	2	1	.....	7	.....	4	2	111
5	1	5	5	.....	3	8	4	.....	10	1	112
10	5	15	9	.....	2	14	6	1	7	2	113
6	5	8	2	.....	1	4	9	3	4	.....	114
4	3	2	1	1	.....	1	3	.....	.....	1	115
1	1	.....	1	.....	.....	.....	5	.....	3	.....	116
.....	1	.....	.....	.....	.....	.....	2	.....	1	.....	117
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	118

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

TABLE 23.—SHIPBUILDING, GOVERNMENTAL ESTABLISHMENTS, BY STATES: 1900.

	United States.	California.	Illinois.[1]	Maine.	Massachusetts.	New York.	Pennsylvania.	South Carolina.	Virginia.	Washington.
Number of establishments	9	1	1	1	1	1	1	1	1	1
Established during the decade	1									1
Capital:										
Total	$54,291,011	$5,347,090	$10,500	$6,082,965	$13,273,708	$18,299,276	$3,198,451	$899,603	$6,380,867	$798,551
Land	$30,412,074	$1,156,387	$2,500	$1,583,200	$8,143,882	$14,345,875	$1,760,440	$118,792	$2,900,998	$400,000
Buildings	$11,515,795	$1,804,213	$5,000	$1,016,135	$3,120,390	$3,089,489	$883,645	$138,505	$1,291,444	$166,974
Machinery, tools, and implements	$8,543,293	$2,216,535	$3,000	$483,630	$1,636,519	$746,062	$479,019	$639,301	$2,188,425	$150,302
Cash and sundries	$3,819,849	$169,955		$3,000,000	$372,917	$117,850	$75,347	$3,005		$80,775
Salaried officials, clerks, etc.:										
Total number	540	112	1	130	82	135	32	8	40	
Total salaries	$466,497	$92,857	$1,500	$31,320	$84,720	$138,489	$27,478	$9,977	$80,156	
Men:										
Number	537	112	1	130	82	132	32	8	40	
Salaries	$463,738	$92,857	$1,500	$31,320	$84,720	$135,730	$27,478	$9,977	$80,156	
Women:										
Number	3					3				
Salaries	$2,759					$2,759				
Wage-earners, including pieceworkers, and total wages:										
Greatest number employed at any one time during the year	9,520	1,441	6	694	1,634	2,450	590	149	2,358	198
Least number employed at any one time during the year	6,261	1,000	6	439	1,068	1,545	302	73	1,787	41
Average number	7,690	1,176	6	559	1,298	1,973	397	104	2,094	83
Wages	$6,222,263	$1,111,486	$4,308	$470,248	$902,579	$1,654,727	$307,913	$47,667	$1,659,214	$64,121
Men, 16 years and over:										
Average number	7,664	1,162	6	559	1,298	1,962	397	104	2,094	82
Wages	$6,202,882	$1,103,986	$4,308	$470,248	$902,579	$1,642,946	$307,913	$47,667	$1,659,214	$64,021
Women, 16 years and over:										
Average number	25	14				11				
Wages	$19,281	$7,500				$11,781				
Children, under 16 years:										
Average number	1									1
Wages	$100									100
Average number of wage-earners, including pieceworkers, employed during each month:[2]										
Men, 16 years and over:										
January	7,437	1,019	6	493	1,128	1,978	362	105	2,302	44
February	7,530	1,001	6	450	1,123	2,064	410	73	2,358	46
March	7,827	1,025	6	444	1,371	2,086	402	117	2,309	67
April	7,779	1,143	6	478	1,450	2,000	401	93	2,115	88
May	8,185	1,161	6	512	1,536	2,212	389	75	2,098	196
June	8,090	1,245	6	560	1,508	2,109	414	73	2,044	131
July	7,458	1,408	6	627	1,205	1,734	338	136	1,813	191
August	7,369	1,164	6	628	1,293	1,968	348	120	1,787	55
September	7,941	1,277	6	661	1,253	2,053	455	143	2,051	42
October	8,289	1,247	6	688	1,346	2,071	439	118	2,331	43
November	7,154	1,153	6	610	1,272	1,701	453	106	1,811	42
December	6,909	1,097	6	555	1,097	1,570	358	80	2,111	40
Miscellaneous expenses:										
Total	$29,064					$9,564	$14,875		$4,625	
Rent of offices, insurance, and all sundry expenses	$19,500						$14,875		$4,625	
Contract work	$9,564					$9,564				
Materials used:										
Total cost	$3,805,326	$536,886	$2,981	$205,012	$843,795	$1,115,650	$243,518	$24,567	$764,558	$68,359
Lumber, all kinds, including logs, timber, and knees, thousand feet, B. M	12,478	1,740	45	792	1,590	3,344	483	188	3,996	300
Cost	$320,049	$43,556	$1,125	$19,875	$39,759	$83,614	$19,957	$4,700	$99,963	$7,500
Pig and scrap iron, tons	1,435	20		196	342	52	175	26	624	
Cost	$20,636	$250		$3,147	$5,489	$600	$788	$862	$10,000	
Iron and steel plates, beams, angles, forgings, bolts, spikes, rivets, girders, castings, etc., pounds	7,294,846	1,200,000	12,000	200,000	2,000,000	2,100,000	367,346	65,500	1,100,000	250,000
Cost	$477,209	$70,321	$360	$16,180	$152,679	$132,384	$7,328	$4,133	$73,824	$20,000
Anchors and chains purchased	$9,964	$326	$200			$161	$8,082		$1,195	
Cordage:										
Wire, feet	147,787	11,500		15,000	11,000	6,000	10,500	243	88,544	5,000
Cost	$18,212	$1,568		$2,347	$1,288	$574	$855	$12	$11,068	$500
Manila and hemp, pounds	692,383	89,045	1,800	23,796	45,850	100,000	18,100	1,392	302,400	10,000
Cost	$88,611	$11,208	$180	$3,966	$7,557	$11,490	$2,578	$232	$50,400	$1,000
Duck	$52,242	$10,032	$24	$2,024	$5,932	$28,879	$5,246	$105		
Paints, oils, etc	$177,575	$24,478	$152	$6,668	$27,756	$68,436	$8,112	$1,973	$40,000	$5,000
Oakum and pitch	$45,316	$2,175	$72	$751	$6,237	$560	$151	$248	$33,122	$2,000
Masts and spars purchased	$2,145	$1,375				$14	$606		$150	
Blocks purchased	$28,086	$930		$288	$1,058	$11,498	$781	$122	$13,413	
Machinery and boilers purchased	$913,387	$109,083		$27,857	$166,408	$274,703	$65,285	$6,040	$248,011	$16,000
Fittings and furniture purchased	$52,103	$3,642		$7,391	$3,926	$12,353	$169	$1,146	$18,476	$5,000
Fuel	$158,103	$40,306	$600	$10,558	$31,007	$34,198	$8,805	$3,069	$27,060	$2,500
Mill supplies	$88,465	$320	$200	$1,756	$9,572	$8,296	$893	$717	$66,211	$500
All other materials	$1,353,156	$217,316		$102,209	$385,127	$452,890	$113,882	$1,708	$71,665	$8,359
Freight	$68		$68							
Products:										
Total value	$11,034,312	$1,741,229	$12,000	$764,022	$1,361,816	$3,895,689	$546,312	$82,211	$2,498,553	$132,480
Barges, number	2							2		
Gross tonnage	180							180		
Net tonnage	120							120		
Value	$1,200							$1,200		
Small boats, launches and ships', life and row boats, etc.:										
Number	677			632			12	3	30	
Value	$114,122			$63,272			$12,350	$2,000	$36,500	
All other products	$4,448,752	$852,222		$367,825	$655,752	$1,709,864	$248,482	$23,227	$591,380	
Repair work	$6,470,238	$889,007	$12,000	$332,925	$706,064	$2,185,825	$285,480	$55,784	$1,870,673	$132,480

[1] State institution.

[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 23.—SHIPBUILDING, GOVERNMENTAL ESTABLISHMENTS, BY STATES: 1900—Continued.

	United States.	California.	Illinois.[1]	Maine.	Massachusetts.	New York.	Pennsylvania.	South Carolina.	Virginia.	Washington.
Comparison of products:										
Number of establishments reporting for both years	8	1	1	1	1	1	1	1	1	.....
Value for census year	$10,901,832	$1,741,229	$12,000	$764,022	$1,361,816	$3,895,689	$546,312	$82,211	$2,498,553	.....
Value for preceding business year	$8,061,093	$575,727	$12,000	$373,620	$678,443	$4,286,935	$97,578	$12,817	$2,023,978	.....
Power:										
Number of establishments reporting	9	1	1	1	1	1	1	1	1	1
Total horsepower	10,998	1,954	25	980	2,467	2,754	685	883	950	350
Owned:										
Engines:										
Steam, number	95	13	1	16	21	19	9	6	7	3
Horsepower	7,465	1,555	25	780	1,582	1,200	540	833	600	350
Gas or gasoline, number	1	.....	.....	.....	.....	1	.....	.....	.....	.....
Horsepower	10	.....	.....	.....	.....	10	.....	.....	.....	.....
Electric motors, number	197	45	.....	11	15	122	4	.....	.....	.....
Horsepower	2,738	399	.....	200	445	1,544	145	.....	.....	.....
Other power, horsepower	790	.....	.....	.....	440	.....	.....	.....	350	.....

[1] State institution.

O

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 167. WASHINGTON, D. C. May 14, 1902.

AGRICULTURE.

NEW MEXICO.

Hon. WILLIAM R. MERRIAM,

Director of the Census.

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics of agriculture in the territory of New Mexico, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that—

> The schedules relating to agriculture shall comprehend the following topics: Name of occupant of each farm, color of occupant, tenure, acreage, value of farm and improvements, acreage of different products, quantity and value of products, and number and value of live stock. All questions as to quantity and value of crops shall relate to the year ending December thirty-first next preceding the enumeration.

A "farm," as defined by the Twelfth Census, includes all land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It includes also the house in which the farmer resides and all other buildings used by him in connection with his farming operations.

The farms of New Mexico, June 1, 1900, numbered 12,311 and had a value of $20,888,814, of which amount $3,565,105, or 17.1 per cent, represents the value of the buildings, and $17,323,709, or 82.9 per cent, the value of the land and improvements other than buildings. On the same date the value of farm implements and machinery was $1,151,610, and of live stock, $31,727,400. These values, added to that of farms, give $53,767,824, the "total value of farm property." The products derived from domestic animals, poultry, and bees, including animals sold and animals slaughtered on farms, are referred to in this bulletin as "animal products." The total value of all such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was $10,155,215, of which amount $7,090,648, or 69.8 per cent, represents the value of animal products, and $3,064,567, or 30.2 per cent, the value of crops, including forest products cut or produced on farms. The "total value of farm products" for 1899 is approximately six times as great as the value reported for 1889.

The "gross farm income" is obtained by deducting from the total value of farm products the value of the products fed to live stock on the farms of the producers. The reported value of products fed in 1899 was $1,037,450, leaving $9,117,765 as the gross farm income for that year. The ratio which this latter amount bears to the "total value of farm property" is referred to as the "percentage of gross income upon investment." For New Mexico in 1899 it was 17.0 per cent.

As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained by any census, no statement of net farm income can be given.

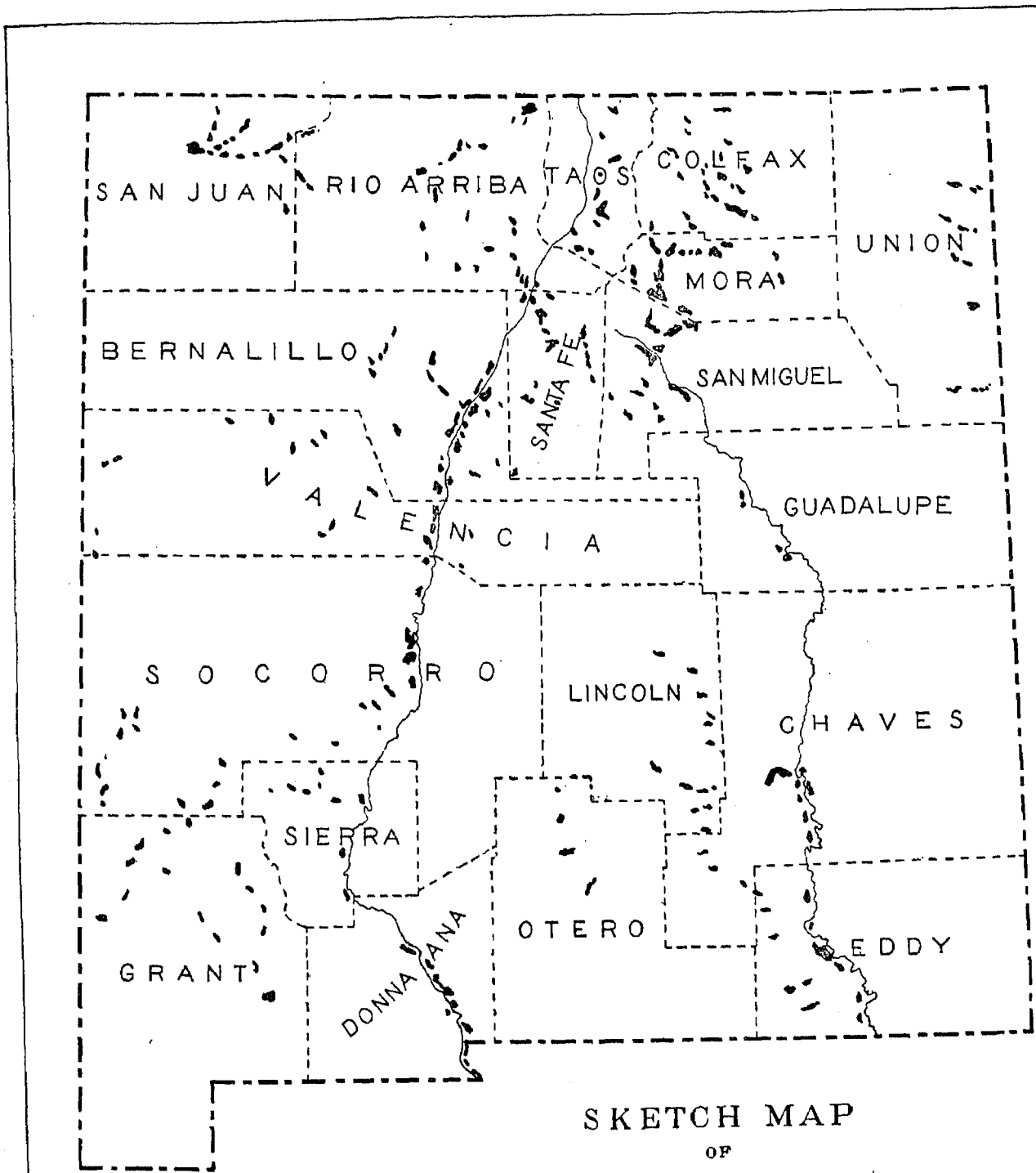
The statistics presented in this bulletin will be treated in greater detail in the final report on agriculture in the United States, which will be published about June 1, 1902. The present publication is designed to present a summarized advance statement for New Mexico.

Very respectfully,

L. G. Powers.

Chief Statistician for Agriculture.

CP 15M



SKETCH MAP
OF
NEW MEXICO
SHOWING THE
IRRIGATED AREAS
ACCORDING TO THE CENSUS OF
1900.

Total Irrigated Area

203,893 Acres

Scale

AGRICULTURE IN NEW MEXICO.

GENERAL STATISTICS.

The total land area of New Mexico is 122,460 square miles, or 78,374,400 acres, of which 5,130,878 acres, or 6.5 per cent, are included in farms.

New Mexico forms a part of the great table-land which is the foundation of the Rocky and Sierra Madre mountain ranges. The territory slopes gently southward, spreading into a broad, level, treeless plain, apparently barren, but very productive when irrigated. The principal river is the Rio Grande, which traverses the center of the territory and receives many tributaries. The western part is drained by the affluents of the Colorado River.

The land produces a variety of native grasses, the most common and valuable being the "mesquite." This grows during the rainy season in July and August, ripens in the fall, dries on its stalk, and furnishes a luxuriant and nutritious forage. This cheap food supply and the mildness of the winters render stock raising especially profitable.

NUMBER AND SIZE OF FARMS.

The following table gives, by decades since 1850, the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1850 TO 1900.

YEAR.	Number of farms.	NUMBER OF ACRES IN FARMS.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.	Average.	
1900	12,311	5,130,878	326,873	4,804,005	416.8	6.4
1890	4,458	787,882	263,106	524,776	176.7	33.4
1880	5,053	631,131	237,392	393,739	124.9	37.6
1870	4,480	833,549	143,007	690,542	186.1	17.2
1860	5,086	1,414,909	149,274	1,265,635	278.2	10.6
1850	3,750	290,671	166,201	124,470	77.5	57.2

The number of farms June 1, 1900, was more than three times as great as that reported in 1850. The figures in the table show a very irregular increase, and it is probable that the gain of 7,853, or 176.2 per cent, between 1890 and 1900, exaggerates the actual growth in that decade, owing to the fact that in 1890 many small farms and ranges operated by Mexicans were not enumerated. The statement that the Eleventh Census was defective in this respect is confirmed by reference to the Farms and Homes volume of that census, which shows that in 1890 there were 9,518 farm families in New Mexico, or 5,060 more than the number of farms given in the report on agriculture for the same year.

The total acreage of farm land has fluctuated greatly from decade to decade, and is now about eighteen times as great as in 1850, and more than six times as great as in 1890. The variations in the area of improved land have been less marked, the increase since 1890 being 63,767 acres, or 24.2 per cent. As this increase is much less than that in the total farm area, the per cent of farm land improved shows a decided decrease since 1890. This circumstance together with the increase in the average size of farms bears out the statement that the raising of live stock is rapidly increasing in importance, and that, as a consequence, large additions are being made to the area used for grazing purposes. At the same time the great reduction in the percentage of "improved land" may be, in some degree, due to a stricter interpretation of that term by the Twelfth Census.

FARM PROPERTY AND PRODUCTS.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year beginning with 1850.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND OF FARM PRODUCTS: 1850 TO 1900.

YEAR.	Total value of farm property.	Land, improvements, and buildings.	Implements and machinery.	Live stock.	Farm products.[1]
1900	$53,767,824	$20,888,814	$1,151,610	$31,727,400	$10,155,215
1890	15,679,120	8,140,800	291,140	[2]7,247,180	1,784,820
1880	10,780,361	5,514,899	255,162	[2]5,010,800	1,897,974
1870[3]	4,779,410	2,260,139	121,114	2,389,157	[4]1,965,060
1860	7,400,049	2,707,986	192,917	4,499,746	----------
1850	3,226,511	1,553,922	77,960	1,494,629	----------

[1] For the year preceding that designated.
[2] Exclusive of the value of animals on ranges.
[3] Values for 1870 were reported in depreciated currency. To reduce to specie basis of other figures they must be diminished one-fifth.
[4] Includes betterments and additions to live stock.

The value of farm property in 1900 was nearly seventeen times as great as in 1850, and over three times as great as in 1890. With the exception of the decade from 1860 to 1870, the increases in the values of the different forms of farm property have been continuous. The remarkable increases in the last decade are due, in part, to a more detailed enumeration in 1900 than in 1890.

In 1880 and in 1890 domestic animals on ranges were not enumerated, hence the values shown in the table are deficient for both these years. The value of animals on ranges in 1890 has been estimated at $16,798,666, which would make the value of all live stock on farms and ranges $24,045,846. Assuming this value to be comparable with that reported in 1900, there has been an increase in the last decade of over 30 per cent.

COUNTY STATISTICS.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUES OF FARM PROPERTY.				Value of products not fed to live stock.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
The Territory	12,311	10,144	5,130,878	326,878	$17,328,709	$3,565,105	$1,151,610	$31,727,400	$9,117,765	$1,951,110	$2,880
Bernalillo	840	755	103,554	18,787	931,630	257,470	84,280	1,375,816	567,004	164,490	----------
Chaves	345	284	135,696	19,068	1,700,357	220,810	66,310	3,584,514	931,456	131,290	----------
Colfax	410	383	1,203,949	37,893	2,191,821	229,349	62,370	1,680,171	492,921	97,480	----------
Donna Ana	571	477	44,720	21,870	774,105	211,507	54,530	522,639	293,422	80,260	----------
Eddy	168	128	289,339	8,676	710,260	77,990	25,880	2,370,277	421,385	70,780	350
Grant	472	425	95,645	14,903	1,207,175	207,610	88,680	3,547,701	1,019,637	184,480	----------
Guadalupe	277	248	64,184	3,711	208,980	94,400	43,450	1,896,218	372,824	133,610	----------
Lincoln	345	319	59,792	7,100	400,810	90,440	22,690	885,438	296,162	29,440	----------
Mora	933	847	262,219	35,163	1,168,125	253,585	90,390	1,068,767	520,563	97,520	----------
Otero	180	171	27,289	3,639	228,650	57,220	15,960	246,544	93,980	10,380	----------
Rio Arriba	860	811	74,223	18,152	584,240	154,850	70,760	1,756,481	500,034	159,880	----------
San Juan	492	472	48,486	16,157	668,810	167,470	63,540	382,341	331,460	35,030	----------
San Miguel	1,297	1,191	1,004,467	23,531	1,746,393	252,017	89,610	2,212,611	529,646	136,130	----------
Santa Fe	918	875	658,930	13,610	1,679,024	498,183	56,250	548,557	320,348	66,490	2,530
Sierra	160	150	462,151	8,036	612,430	59,220	24,040	1,132,892	153,417	47,320	----------
Socorro	991	905	166,795	17,728	701,805	226,330	76,710	2,597,826	534,774	163,700	----------
Taos	629	609	47,136	13,889	259,214	106,894	48,960	477,081	352,079	35,320	----------
Union	419	374	254,161	9,652	675,380	214,680	52,190	3,721,412	850,640	182,620	----------
Valencia	618	523	65,929	11,973	524,690	171,950	60,770	1,415,683	391,638	124,650	----------
Jicarilla Apache[1]	42	----------	6,008	1,695	60,080	----------	6,950	11,802	616	----------	----------
Pueblo[1]	1,077	197	51,838	17,373	246,250	13,130	47,290	194,597	91,084	----------	----------
Zuni[1]	267	----------	4,367	4,367	43,530	----------	----------	98,037	52,675	290	----------

[1] Indian reservation.

The average size of farms, outside of the Indian reservations, ranges from 74.9 acres in Taos county to 2,936.5 acres in Colfax county; the average value of farms, from $582.05 in Taos county to $5,905.29 in Colfax county; the average value of live stock per farm, from $597.56 in Santa Fe county to $14,108.79 in Eddy county; and the average value of the farm products of 1899 not fed to live stock, from $348.96 in Santa Fe county to $2,699.87 in Chaves county.

Increases in the number, acreage, and value of farms have taken place in all counties except Valencia and Taos and certain others which have undergone territorial reductions in the decade, but all counties, regardless of such changes, show great increases in the total value of live stock and farm products.

FARM TENURE.

Table 4 gives a comparative exhibit of farm tenure for 1880, 1890, and 1900. In Table 5 the tenure of farms for 1900 is given by race of farmer. The farms classified in Table 4 as "farms operated by owners" are subdivided in Table 5 into four groups, designated as farms operated by "owners," "part owners," "owners and tenants," and "managers." These terms denote, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it, and the other, or others, owning no part, but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

The farms operated by tenants are divided into two groups designated as farms operated by "cash tenants" and "share tenants." These groups comprise, respectively: (1) Farms operated by individuals who pay a rental in cash or a stated amount of labor or farm produce; (2) farms operated by individuals who pay as rental a stated share of the products.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES: 1880 TO 1900.

YEAR.	Total number of farms.	NUMBER OF FARMS OPERATED BY—			PER CENT OF FARMS OPERATED BY—		
		Owners.[1]	Cash tenants.	Share tenants.	Owners.[1]	Cash tenants.	Share tenants.
1900	12,311	11,157	271	883	90.6	2.2	7.2
1890	4,458	4,257	33	168	95.5	0.7	3.8
1880	5,053	4,645	22	386	91.9	0.4	7.7

[1] Including "part owners," "owners and tenants," and "managers."

TABLE 5.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.

PART 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE.	Total number of farms.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
The Territory	12,311	10,105	498	71	483	271	883
White	10,893	8,712	497	57	483	268	876
Colored	1,418	1,393	1	14	----	3	7
Chinese	3	1	----	----	----	1	1
Indian	1,401	1,382	1	14	----	1	3
Negro	14	10	----	----	----	1	3

PART 2.—PER CENT OF FARMS OF SPECIFIED TENURES.

The Territory	100.0	82.1	4.0	0.6	3.9	2.2	7.2
White	100.0	80.0	4.6	0.5	4.4	2.5	8.0
Colored	100.0	98.2	0.1	1.0	----	0.2	0.5

The number of farms operated by owners was 388 less in 1890 than in 1880. In the last decade, however, there was an increase of 6,900, making the number on June 1, 1900, more than double the number reported twenty years before. This apparently large increase, however, is due principally to a much more complete enumeration in 1900 than in 1890 of certain classes of small farms mentioned in the discussion of Table 1. Cash tenants increased in number in both decades. The number of share tenants decreased between 1880 and 1890, but increased rapidly in the last ten years.

Of the farms of the territory, 88.5 per cent are operated by white farmers and 11.5 per cent by colored farmers. Of the farms of white farmers, 85.1 per cent are operated by owners or part owners; for farms of colored farmers, practically all of whom are Indians, the corresponding per cent is 99.3.

No previous census has reported the number of farms operated by "part owners," "owners and tenants," or "managers," but it is believed that the number conducted by the last-named class is constantly increasing.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY TENURE, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	12,311	416.8	5,130,878	100.0	$53,767,824	100.0
White farmers	10,893	463.6	5,049,808	98.4	52,935,613	98.5
Colored farmers [1]	1,418	57.2	81,070	1.6	832,211	1.5
Owners	10,105	163.0	1,647,303	32.1	26,492,859	49.3
Part owners	498	1,531.7	762,766	14.9	5,184,857	9.6
Owners and tenants	71	159.6	11,334	0.2	148,988	0.3
Managers	488	4,725.9	2,282,612	44.5	19,496,343	36.3
Cash tenants	271	1,233.1	334,178	6.5	1,037,641	1.9
Share tenants	883	105.0	92,685	1.8	1,407,186	2.6

[1] Comprising 3 Chinese, 1,401 Indians, and 14 negroes.

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$1,407	$290	$93	$2,577	$741	17.0
White farmers	1,556	326	100	2,878	826	17.0
Colored farmers [1]	266	12	40	299	87	14.8
Owners	824	239	83	1,476	436	16.6
Part owners	3,355	651	188	5,707	1,660	15.9
Owners and tenants	920	375	103	709	428	20.4
Managers	11,651	1,114	332	27,268	7,327	18.2
Cash tenants	2,160	502	96	1,071	424	11.1
Share tenants	910	143	56	485	231	14.5

[1] Comprising 3 Chinese, 1,401 Indians, and 14 negroes.

The average values and the per cent of gross income are very much lower for colored than for white farmers. Of the groups by tenure, farms operated by managers, part owners, and cash tenants have by far the greatest average acreage and the highest average values of property and products. This is due to the fact that most of the live-stock farms using large areas of public range and leased land are included in these groups. When such farms are leased, a cash rental is generally preferred by both landlord and tenant. The average size and values of farms operated by owners are materially reduced by the many small farms found in this group.

The total value of the farm property of the 14 negro farmers was $30,340, and of their products, $3,450. They operated an area of 18,418 acres. The 3 Chinese used an area of 20 acres, the values of property and products being $5,810 and $6,330, respectively.

FARMS CLASSIFIED BY AREA.

Tables 8 and 9 present the principal statistics for farms classified by area.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

AREA.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	12,311	416.8	5,130,878	100.0	$53,767,824	100.0
Under 3 acres	701	1.0	700	(1)	2,957,719	5.5
3 to 9 acres	2,190	5.7	12,520	0.2	1,351,313	2.5
10 to 19 acres	2,166	13.2	28,647	0.6	1,975,683	3.7
20 to 49 acres	2,197	30.0	65,950	1.3	3,174,600	5.9
50 to 99 acres	959	68.7	65,875	1.3	1,972,577	3.7
100 to 174 acres	2,696	153.4	413,440	8.1	9,315,214	17.3
175 to 259 acres	288	210.2	60,585	1.2	1,624,922	3.0
260 to 499 acres	481	352.1	169,374	3.3	4,401,228	8.2
500 to 999 acres	308	709.1	218,411	4.2	5,431,885	10.1
1,000 acres and over	325	12,601.3	4,095,426	79.8	21,562,783	40.1

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

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$1,407	$290	$93	$2,577	$741	17.0
Under 3 acres	74	118	29	3,993	911	21.6
3 to 9 acres	212	138	36	231	119	19.2
10 to 19 acres	300	149	49	414	201	22.0
20 to 49 acres	590	181	75	599	263	18.2
50 to 99 acres	937	259	93	768	378	18.1
100 to 174 acres	1,002	280	109	2,084	624	18.1
175 to 259 acres	1,987	544	192	2,919	1,018	18.0
260 to 499 acres	2,580	673	207	5,690	1,444	16.8
500 to 999 acres	4,656	912	260	11,778	2,851	16.2
1,000 acres and over	24,627	2,304	500	38,916	10,160	15.8

The group of farms of largest area contains less than 3 per cent of the total number of farms, but comprises nearly four-fifths of the total farm acreage, and over two-fifths of the total value of farm property.

For farms containing over 3 acres, the average values given in Table 9 rise in unbroken series as the farms increase in size. For farms under 3 acres, the average values for live stock and gross income are relatively high, as a large proportion of these are stock farms using ranges or the public domain. This group includes also a number of city dairies, the incomes from which are determined, not so much by the acreage of land used, as by the amount of capital invested and the expenditures for labor.

The average gross incomes per acre for the various groups classified by area are as follows: Farms under 3 acres, $912.40; 3 to 9 acres, $20.70; 10 to 19 acres, $15.17; 20 to 49 acres, $8.76; 50 to 99 acres, $5.43; 100 to 174 acres, $4.07; 175 to 259 acres, $4.84; 260 to 499 acres, $4.10; 500 to 999 acres, $4.03; and 1,000 acres and over, $0.81. The low average for the group of farms containing from 100 to 174 acres is doubtless due to the fact that this group contains a large number of recently entered homesteads of 160 acres each.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

In Tables 10 and 11 farms are classified by principal source of income. If the value of the hay and grain raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of products not fed to live stock, the farm is classified as a "hay and grain" farm. If vegetables are the leading crop, constituting 40 per cent of the value of the products, it is a "vegetable" farm. The farms of the other groups are classified in accordance with the same principle. "Miscellaneous" farms are those whose operators do not derive 40 per cent of their income from any one class of farm products. Farms with no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

PRINCIPAL SOURCE OF INCOME.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	12,311	416.8	5,130,878	100.0	$53,767,824	100.0
Hay and grain	4,871	81.9	399,136	7.8	6,637,522	12.4
Vegetables	430	67.5	29,029	0.6	694,860	1.3
Fruit	342	102.8	35,161	0.7	1,069,789	2.0
Live stock	4,084	1,067.3	4,358,724	84.9	41,188,574	76.6
Dairy produce	682	177.1	120,768	2.3	1,790,607	3.3
Miscellaneous[1]	1,902	98.9	188,065	3.7	2,386,472	4.4

[1] Including 4 sugar farms, 1 nursery farm, and 4 florists' establishments.

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$1,407	$290	$93	$2,577	$741	17.0
Hay and grain	889	179	68	227	254	18.6
Vegetables	742	198	73	603	269	16.7
Fruit	1,935	752	100	341	552	17.6
Live stock	2,398	418	137	7,132	1,756	17.4
Dairy produce	1,159	356	105	1,006	295	11.2
Miscellaneous[1]	750	212	65	227	107	8.5

[1] Including 4 sugar farms, 1 nursery farm, and 4 florists' establishments.

For the several classes of farms the average values per acre of products not fed to live stock are as follows: Farms whose operators derived their principal income from flowers and plants, $481.82; nursery products, $197.41; fruit, $5.36; vegetables, $3.99; hay and grain, $3.10; dairy produce, $1.66; live stock, $1.65; sugar, $1.54; and miscellaneous products, $1.03.

In computing these averages the total area of the farms of each group is used, and not the acreage devoted to the crop from which the principal income is derived.

The wide variations shown in the average gross income and in percentage of gross income upon investment, are due largely to the fact that in computing income no deduction is made for expenses. For florists' establishments, nurseries, and market gardens, the average expenditures for such items as labor and fertilizers represent a far larger percentage of the gross income than in the case of "hay and grain," "live-stock," or "miscellaneous" farms. Were it possible to present the average net income, the variations shown would be comparatively slight.

FARMS CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Tables 12 and 13 present data relating to farms classified by reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	12,311	416.8	5,130,878	100.0	$53,767,824	100.0
$0	734	145.9	107,110	2.1	1,333,910	2.5
$1 to $49	1,997	42.1	84,118	1.6	1,032,140	1.9
$50 to $99	1,612	67.0	108,074	2.1	1,337,030	2.5
$100 to $249	2,846	106.3	302,478	5.9	3,468,710	6.5
$250 to $499	1,909	133.8	255,446	5.0	4,058,910	7.5
$500 to $999	1,434	510.2	731,574	14.2	6,079,600	11.3
$1,000 to $2,499	1,109	456.9	506,696	9.9	8,820,320	16.4
$2,500 and over	670	4,530.4	3,035,382	59.2	27,631,204	51.4

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$1,407	$290	$93	$2,577	$741	17.0
$0	518	147	40	1,120		
$1 to $49	268	75	35	139	7	1.5
$50 to $99	408	119	45	257	41	4.9
$100 to $249	565	166	55	433	111	9.1
$250 to $499	808	256	90	972	254	12.0
$500 to $999	1,588	374	182	2,146	522	12.3
$1,000 to $2,499	2,471	594	185	4,703	1,219	15.3
$2,500 and over	11,319	1,481	383	28,108	9,157	22.2

For many farms in the first group, the absence of any reported income is due to the inability of the enumerators to secure complete reports, owing to changes in ownership or tenancy which occurred shortly prior to the date of enumeration. Frequently the person in charge June 1, 1900, could not give definite information concerning the products of the preceding year. The same statement is true of some of the farms with reported incomes of less than $100, and to this extent the reports fall short of giving a complete exhibit of farm income in 1899.

Some of the farms reporting no income were doubtless homesteads taken up in the spring of 1900, and the high average value of live stock indicates that some were cattle ranches which reported no sales in 1899. Many of the farms of the first group report products fed to live stock.

LIVE STOCK.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the census of 1900. The age grouping for neat cattle was determined by their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep, by age and sex. The new classification permits a close comparison with the figures of previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS.

LIVE STOCK.	Age in years.	ON FARMS.			NOT ON FARMS.
		Number.	Value.	Average value.	Number.
Calves	Under 1	188,702	$1,989,648	$10.54	919
Steers	1 and under 2	89,367	1,492,875	16.70	816
Steers	2 and under 3	32,867	720,012	21.91	128
Steers	3 and over	19,646	547,876	27.89	331
Bulls	1 and over	27,532	1,097,114	39.85	116
Heifers	1 and under 2	114,045	1,766,334	15.49	361
Cows kept for milk	2 and over	16,776	510,048	30.41	1,345
Cows and heifers not kept for milk.	2 and over	502,865	9,854,024	19.60	1,415
Colts	Under 1	16,636	99,127	5.95	519
Horses	1 and under 2	16,550	177,458	10.72	514
Horses	2 and over	97,937	1,943,884	19.85	8,692
Mule colts	Under 1	561	8,040	14.33	17
Mules	1 and under 2	632	15,307	24.22	13
Mules	2 and over	4,118	159,785	38.80	607
Asses and burros	All ages	15,902	64,528	4.06	1,507
Lambs	Under 1	1,566,744	2,370,563	1.51	1,000
Sheep (ewes)	1 and over	2,856,876	6,828,816	2.40	1,781
Sheep (rams and wethers).	1 and over	482,867	1,444,135	2.99	273
Swine	All ages	20,426	81,644	4.00	1,440
Goats	All ages	224,186	472,961	2.11	12,216
Fowls:[1]					
Chickens[2]		156,858			
Turkeys		8,805			
Geese		830	62,419		
Ducks		1,527			
Bees (swarms of)		6,164	20,802	3.37	
Value of all live stock			31,727,400		

[1] The number reported is of fowls over 3 months old. The value is of all, old and young.
[2] Including Guinea fowls.

The total value of live stock on farms and ranges, June 1, 1900, was $31,727,400, of which 55.1 per cent represents the value of neat cattle aside from dairy cows; 38.5 per cent, that of sheep; 7.0 per cent, that of horses; 1.6 per cent, that of dairy cows; 1.5 per cent, that of goats; and 1.3 per cent, that of all other live stock.

The low average value of horses is due to the fact that a large per cent of all horses in the territory are Mexican or Indian ponies. The reports show three times as many asses and burros as mules, and nearly one-sixth as many asses and burros as horses two years old and over. The greatest number of these animals is found in the mountainous northern and north central counties.

Thirteen goats are reported to one milch cow, and the total value of goats is nearly equal to that of milch cows. In this territory the goat is a very useful animal, living on scant food picked from among the rocks, and furnishing meat, milk, and mohair.

No reports were secured of the value of live stock not on farms and ranges, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, however, the total value of domestic animals not on farms would be $355,601. The value of goats kept in towns and cities for dairy and other purposes constitutes 7.7 per cent of the value of all live stock not

on farms. Exclusive of poultry and bees not on farms, the total value of all live stock in the territory is approximately $32,083,000.

CHANGES IN LIVE STOCK KEPT ON FARMS AND RANGES.

The following table shows the changes since 1850 in the numbers of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS AND RANGES: 1850 TO 1900.

YEAR.	Dairy cows.	Other neat cattle.	Horses.	Mules and asses.	Sheep.[1]	Swine.
1900	15,775	975,084	131,158	21,213	3,333,743	20,426
1890[2]	13,507	559,004	38,130	8,367	1,248,970	10,471
1880[2]	12,955	153,746	14,547	9,063	2,088,831	7,357
1870	16,417	41,117	5,033	6,141	619,438	11,267
1860	34,369	54,360	10,066	11,291	830,116	10,313
1850	19,635	22,342	5,079	8,654	377,271	7,314

[1] Lambs not included.
[2] Excluding animals on ranges.

The live-stock enumeration in 1880 and 1890 did not include domestic animals on ranges, hence the figures presented in the table for those years are not strictly comparable with the figures for 1900. The numbers of animals on ranges in 1890 were estimated by special agents to be as follows: All neat cattle, 1,054,022; horses, 54,192; mules and asses, 14,265; sheep, 1,225,524; swine, 785. In the following comparisons between the number of animals reported in 1900 and the number reported in 1890, these estimates are disregarded.

The last half century, taken by decades, shows many fluctuations in the numbers of all domestic animals. The last decade shows increases in every class except dairy cows, and the decrease in their number is probably more apparent than real, the term "dairy cows" having been restricted in 1900 to cows kept for dairying purposes at the time of enumeration. As a result of this limitation many cows which were milked at some time in the year were probably classified as "cows and heifers not kept for milk" and included under the head "other neat cattle." The probability that this occurred is confirmed by the large increase shown in dairy products.

The census of 1900 shows 57.7 per cent more dairy cows than were reported in 1850; forty-three times as many "other neat cattle;" twenty-five times as many horses; twice as many mules; nearly nine times as many sheep; and almost three times as many swine.

Although in 1900 the enumerators were instructed to report no fowls less than 3 months old, while the reports of 1890 include those of all ages, four times as many turkeys and nearly four times as many geese were reported as in 1890. The number of chickens has increased 158.9 per cent during the decade and the number of ducks 38.3 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the products of the animal industry.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED, ON FARMS, IN 1899.

PRODUCTS.	Unit of measure.	Quantity.	Value.
Wool	Pounds	15,209,199	$1,954,171
Mohair and goat hair	Pounds	113,545	29,917
Milk	Gallons	[1]3,009,657	
Butter	Pounds	313,003	[2]439,423
Cheese	Pounds	68,571	
Eggs	Dozens	889,890	157,175
Poultry			90,152
Honey	Pounds	139,998	13,836
Wax	Pounds	2,450	
Animals sold			3,740,678
Animals slaughtered			606,206
Total value			7,090,648

[1] Comprises all milk produced, whether sold, consumed, or made into butter or cheese.
[2] Comprises the value of milk sold and consumed and of butter and cheese made.

The value of animal products in 1899 was $7,090,648, or 69.8 per cent of the value of all farm products, and 77.8 per cent of the gross farm income. Of the total value, 61.3 per cent represents the value of animals sold and slaughtered on farms and ranges; 28.0 per cent, the value of wool, mohair, and goat hair; 7.0 per cent, the value of dairy products; 3.5 per cent, the value of poultry and eggs; and 0.2 per cent, the value of honey and wax.

ANIMALS SOLD AND SLAUGHTERED.

The value of animals sold and slaughtered in 1899 constitutes 47.7 per cent of the gross farm income. Of the total number of farms in the territory reporting live stock, 3,962, or 34.0 per cent, report animals slaughtered, the average value per farm being $152.78. Sales of live animals were reported by 2,991 farmers, or 25.6 per cent of the total number, the average receipts per farm being $1,250.64. In obtaining these reports, the enumerators were instructed to secure from each farm operator a statement of the amount received from sales in 1899, less the amount paid for animals purchased during the same year.

DAIRY PRODUCE.

More than four times as much milk and nearly four times as much butter were reported in 1900 as in 1890, while the quantity of cheese made on farms increased nearly fourfold in the same time.

Of the $499,423 given in Table 16 as the value of dairy products, 63.0 per cent represents the value of such products consumed on farms, and 37.0 per cent, the amount received from sales. Of the latter amount, $147,730 was received from the sale of 633,638 gallons of milk; $29,030, from 116,816 pounds of butter; $5,106, from 38,164 pounds of cheese; and $3,037, from 3,246 gallons of cream.

POULTRY AND EGGS.

The total value of the products of the poultry industry in 1899 was $247,327, of which 63.5 per cent represents the value of eggs produced, and 36.5 per cent, the value of

fowls raised. Three times as many eggs were produced in 1899 as ten years before.

WOOL, MOHAIR, AND GOAT HAIR.

In no branch of agriculture has greater progress been made in the last decade than in wool growing. Nearly four times as much wool was reported in 1900 as in 1890 and the average weight of fleeces increased from 2.4 pounds to 4.2 pounds. Many of the sheep are shorn twice a year, which accounts for the comparatively light weight of the fleeces. The operators of 99 farms reported mohair or goat hair in 1899. Most of the clip of 113,545 pounds was reported from the southern part of the territory, Sierra and Socorro counties having more than half of the total amount. The average weight per fleece was 2.0 pounds.

HONEY AND WAX.

The quantity of honey produced in 1899 was 139,998 pounds, or over six times the quantity obtained in 1889. The quantity of wax produced in 1899 was 2,450 pounds, or twenty-five times the product of 1889.

HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS AND RANGES.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number of these animals, and the average number per farm. In computing the averages presented, only those farms which report the kind of stock under consideration are included.

TABLE 17.—HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS, JUNE 1, 1900.

CLASSES.	HORSES.			DAIRY COWS.		
	Farms reporting.	Number.	Average per farm.	Farms reporting.	Number.	Average per farm.
Total	10,792	131,153	12.2	4,044	16,775	4.1
White farmers	9,575	121,006	12.6	3,883	15,962	4.1
Colored farmers	1,217	10,147	8.3	161	813	5.0
Owners[1]	9,390	97,835	10.4	3,471	14,327	4.1
Managers	440	27,444	62.4	206	942	4.6
Cash tenants	232	2,140	9.2	132	708	5.4
Share tenants	730	3,734	5.1	235	798	3.4
Under 20 acres	4,115	24,579	6.0	987	3,354	3.4
20 to 99 acres	2,871	15,914	5.5	1,072	3,270	3.1
100 to 174 acres	2,449	32,312	13.2	1,102	4,487	4.1
175 to 259 acres	283	4,614	16.3	180	957	5.3
260 acres and over	1,074	53,734	50.0	703	4,707	6.7
Hay and grain	4,062	19,247	4.7	998	2,686	2.7
Vegetable	371	2,411	6.5	78	304	3.9
Fruit	247	1,021	4.1	116	288	2.5
Live stock	3,797	93,826	24.7	1,580	6,694	4.2
Dairy	643	6,819	10.6	682	5,447	8.0
Miscellaneous[2]	1,672	7,829	4.7	590	1,356	2.3

[1] Including "part owners" and "owners and tenants."
[2] Including nurseries, sugar farms, and florists' establishments.

CROPS.

The following table presents the statistics of the principal crops of 1899.

TABLE 18.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

CROPS.	Acres.	Unit of measure.	Quantity.	Value.
Corn	41,345	Bushels	677,305	$419,936
Wheat	87,907	Bushels	603,303	390,616
Oats	15,848	Bushels	342,777	154,347
Barley	1,110	Bushels	24,107	12,475
Rye	48	Bushels	1,064	701
Buckwheat	6	Bushels	73	50
Flaxseed	1	Bushels	3	3
Kafir corn	138	Bushels	4,473	1,778
Clover seed		Bushels	45	320
Hay and forage	87,352	Tons	196,545	1,427,317
Tobacco	6	Pounds	1,460	173
Broom corn	14	Pounds	5,800	290
Peanuts	1	Bushels	10	12
Dry beans	3,349	Bushels	36,022	73,001
Dry pease	2,220	Bushels	28,071	20,365
Potatoes	1,122	Bushels	72,613	49,552
Sweet potatoes	47	Bushels	6,180	4,588
Onions	160	Bushels	25,014	27,567
Miscellaneous vegetables	3,874			179,857
Sorghum cane	81	Tons	113	364
Sorghum sirup		Gallons	2,812	1,599
Sugar cane	5	Tons	191	705
Sugar cane kept for seed		Tons	20	70
Sugar beets	1,298	Tons	3,965	16,849
Small fruits	48			5,768
Grapes	[1]787	Centals	15,159	[2]33,717
Orchard fruits	[1]7,219	Bushels	267,335	[3]197,331
Nuts				162
Figs		Pounds	30	1
Forest products				34,198
Flowers and plants	4			4,442
Nursery products	32			5,753
Miscellaneous				660
Total	204,028			3,064,567

[1] Estimated from number of vines or trees.
[2] Including value of wine, raisins, etc.
[3] Including value of cider, vinegar, etc.

Of the total value of the crops in 1899, hay and forage contributed 46.6 per cent; cereals, 32.0 per cent; vegetables, including potatoes, sweet potatoes, and onions, 8.5 per cent; fruits and nuts, 7.7 per cent; dry beans and dry pease, 3.1 per cent; and other crops, 2.1 per cent.

The average value per acre of the various crops was as follows: Flowers and plants, $1,110.50; nursery products, $179.78; onions, $172.29; small fruits, $120.17; sweet potatoes, $97.62; miscellaneous vegetables, $46.43; potatoes, $44.16; tobacco, $28.83; orchard fruits, $27.33; hay and forage, $16.34; and cereals, $10.16. The crops yielding the highest average returns per acre were grown upon very highly improved land. Their production required a large amount of labor and the greatest relative expenditures for fertilizers.

HAY AND FORAGE.

In 1900, 5,454 farmers, or 44.3 per cent of the total number, reported hay and forage crops. Exclusive of corn stalks and corn strippings, the average yield per acre was 2.2 tons. The acreage in hay and forage in 1899 was 231.2 per cent greater than ten years before.

In 1899 the acreages and yields of the various kinds of hay and forage were as follows: Alfalfa or lucern, 55,467 acres and 154,973 tons; wild, salt, or prairie grasses, 19,233 acres and 19,155 tons; grains cut green for hay, 4,857 acres and 7,871 tons; forage crops, 4,713 acres and 9,143 tons; and other hay and forage crops, 4,495 acres and 5,377 tons.

In Table 18 the production of corn stalks and corn strippings is included but the acreage is not, as the forage secured was only an incidental product of the land on which it was raised.

CEREALS.

The following table is an exhibit of the changes in cereal production since 1849.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS: 1849 TO 1899.

PART 1.—ACREAGE.

YEAR.[1]	Barley.	Buckwheat.	Corn.	Oats.	Rye.	Wheat.
1899	1,110	6	41,345	15,848	48	37,907
1889	1,484	81	28,539	9,314	69	21,853
1879	2,543	----------	41,449	9,287	17	51,230

[1] No statistics of acreage were secured prior to 1879.

PART 2.—BUSHELS PRODUCED.

1899	24,107	73	677,305	342,777	1,064	603,303
1889	35,024	744	583,489	193,832	810	343,484
1879	50,053	----------	633,785	156,527	240	706,641
1869	3,876	10	640,823	67,660	42	352,822
1859	6,099	6	709,304	7,246	1,300	434,309
1849	5	100	365,411	5	----------	196,516

The total area devoted to cereals in 1899 was 96,264 acres; in 1889, 61,340 acres; and in 1879, 104,481 acres. Corn and wheat are the principal cereals and of the total acreage in cereals in 1899, 82.3 per cent was divided about equally between these crops. For each of them the acreage in 1899 was considerably larger than it was ten years before, though not so large as in 1879. The decreases for the twenty-year period were 0.3 per cent in the acreage of corn and 26.0 per cent in that of wheat. The acreage in oats, the cereal next in importance, showed an increase of 70.2 per cent and constituted, in 1899, 16.5 per cent of the total area in cereals. This cereal is grown principally in the northern counties, while corn and wheat are staple crops throughout the territory. Barley is a relatively unimportant crop and shows a decreasing acreage, while not a hundred acres of rye or of buckwheat have been reported by any of the last three censuses.

The second part of the table shows wide fluctuations from decade to decade in the production of each of the cereals except oats, for which a steady increase is noted. In this territory the nature of the season and the supply of water for irrigation purposes are the principal factors in determining the production of grain in any given year. In addition most of the cereals are grown chiefly or wholly for home consumption, and consequently production varies according to local conditions.

In the last decade, however, cereal production as a whole has doubtless been stimulated by increases in population and by the development of irrigation facilities.

ORCHARD FRUITS.

The changes in orchard fruits since 1890 are shown in the following table.

TABLE 20.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

FRUITS.	NUMBER OF TREES.		BUSHELS OF FRUIT.	
	1900.	1890.	1899.	1889.
Apples	483,157	40,416	142,332	37,192
Apricots	12,418	2,582	6,637	744
Cherries	18,296	3,383	5,228	672
Peaches	117,003	23,081	76,204	17,822
Pears	39,877	2,896	14,777	1,526
Plums and prunes	48,296	9,924	18,492	2,230

The value of the orchard fruits grown in 1899 was $197,331, approximately one-half of which was contributed by Santa Fe, Donna Ana, and Rio Arriba counties.

In 1900, 67.2 per cent of all fruit trees in the territory were apple trees, and in 1890, 49.1 per cent. The number of these trees increased twelvefold in ten years, Chaves county reporting, in 1900, 26.9 per cent of the entire number. Between 1890 and 1900 the total number of peach trees increased fivefold. They are found in most parts of the territory, but in 1900, 48.7 per cent were in San Juan, Donna Ana, and Grant counties. During the last decade plum and prune, pear, cherry, and apricot trees have increased in number very rapidly.

In addition to the trees shown in Table 20, unclassified orchard trees to the number of 8,566 are reported, with a yield of 4,165 bushels of fruit. The value of orchard products, given in Table 18, includes the value of 655 barrels of cider, 556 barrels of vinegar, and 10,550 pounds of dried and evaporated fruits.

As the quantity of fruit produced in any year is determined largely by the nature of the season, comparisons between the crops of 1889 and 1899 have little significance.

SMALL FRUITS.

The total area used in the cultivation of small fruits in 1899 was 48 acres, distributed among 282 farms. The acreage and production of the various fruits are as follows: Currants, 10 acres and 14,340 quarts; gooseberries, 12 acres and 11,680 quarts; strawberries, 9 acres and 15,400 quarts; raspberries and Logan berries, 9 acres and 8,930 quarts; blackberries and dewberries, 3 acres and 2,940 quarts; and other berries, 5 acres and 6,400 quarts.

The value of fruits grown was $5,768, an average of $20.45 per farm. Outside of Chaves, Santa Fe, and San Juan counties, which are credited with 72.6 per cent of the total value of the crop of 1899, small fruits received little attention.

VEGETABLES.

The total area devoted to vegetables, including potatoes, sweet potatoes, and onions, was 5,203 acres. Of the 3,874 acres devoted to miscellaneous vegetables, the products of 2,012 acres were not reported in detail, as the greater part of this acreage was included in small family gardens. Of the remaining 1,862 acres, 638 acres were devoted to muskmelons; 493 acres, to watermelons; 262 acres, to sweet corn; 178 acres, to squashes; 168 acres, to cabbage; and 128 acres, to other vegetables.

SORGHUM.

The first report of sorghum grown for sirup making was obtained in 1860. From that date until 1890 the production fluctuated widely, the quantity of sirup made in the latter year being 3,150 gallons. In 1900 but 1,599 gallons were reported, a decrease of over 50.0 per cent for the decade.

FLORICULTURE AND NURSERIES.

Flowers and plants were grown in 1899 by 9 farmers. Of this number 4 derived their principal income from the sale of floral products, having a capital of $14,000 invested in land and buildings, and securing in 1899 products valued at $5,300. They used 22,990 square feet of glass surface.

While 11 farmers reported nursery stock, but 1 derived over 40.0 per cent of his income from the sale of nursery products, his receipts in 1899 from 22 acres having been $4,343.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899, including the value of board furnished, was $1,951,110, an average of $158 per farm. The average was highest on the most intensively cultivated farms and on the large cattle ranges, having been $1,500 for nurseries, $384 for live-stock farms, $200 for florists' establishments, $120 for fruit farms, $98 for vegetable farms, $85 for sugar farms, $52 for dairy farms, and $43 for hay and grain farms. "Managers" expended on an average $1,489; "part owners," $406; "owners," $96; "cash tenants," $90; "owners and tenants," $87; and "share tenants," $32. White farmers expended $179 per farm and colored farmers $3.

Fertilizers purchased in 1899 cost $2,880, an average of less than 25 cents per farm. The average expenditure was greatest for nurseries, amounting to $250. For florists' establishments the average was $15, and for fruit farms, $3.

INDIAN RESERVATIONS.

The New Mexico reserves reporting agriculture are the Jicarilla Apache reservation and the 19 pueblos of the Pueblo Indians. The reports of the latter, with the exception of Zuni, have been consolidated into one. Zuni, the largest and most remote of the pueblos, is more properly entitled to be called a reservation, as the tract conveyed by the original Spanish grant has been many times enlarged within recent years by grants from the United States Government.

The Jicarilla Apache and the Pueblo represent two distinct types of Indian agriculturists; the first, formerly a wild, nomadic tribe, has been forced through the encroachment of the white race to adopt the ways of civilization and to look to the soil for support; the second, possessing a distinct civilization of its own, was a peaceable, agricultural people long before the approach of the Spaniards.

JICARILLA APACHE RESERVATION.

Jicarilla Apache reservation, containing an area of 650 square miles, is situated in Rio Arriba county in the extreme northern part of New Mexico. It is chiefly a timber and grazing region consisting of low pine hills, mesas, and small valleys between narrow canyons.

The Jicarilla Apache, of Athapascan stock, numbered 829 on June 1, 1900. Their principal occupation is raising sheep and goats, although a few cultivate small areas of corn, wheat, or oats, with potatoes, or other vegetables, and cut large quantities of wild hay.

Most of the 42 Indian farmers reporting, cultivated from 4 to 10 acres of grain and vegetables, but their crops in the census year were practically destroyed by drought. These Indians are very proficient in making bows and arrows, baskets, and articles of bead work, for which they find a ready market, their sales of these articles in 1899 having amounted to $7,000.

PUEBLO RESERVATION.

The Pueblo reserves, nineteen in number, are widely scattered throughout the north central part of New Mexico, in Bernalillo, Rio Arriba, Santa Fe, Valencia, and Taos counties, most of them lying along the Rio Grande or its tributaries. Strictly speaking they are not reservations, being grants of the Spanish government, confirmed by United States patents. Exclusive of Zuni, which is reported separately, their total area is 1,081 square miles, and their total population, 6,602. The people live in adobe and stone houses, from two to five stories in height, which are collected in close, compact villages, or pueblos, usually located in the midst of their farm lands. They are peaceable and industrious, devoting all their time to their flocks and their fields of growing crops. The Pueblo are also noted pottery makers, and find a market for their product among visitors and in neighboring cities. Though generally self-supporting, they are very poor and in times of extreme drought require aid from the Government.

Their principal crops are Indian corn and wheat, although some pueblos raise a small amount of alfalfa. Beans, chili, onions, melons, and squashes constitute their supply of vegetables. Many Indians have small orchards of peach and apricot trees, and some also have apple, cherry, and plum trees, and grape vines.

No crops can be raised without irrigation, which the Pueblo have practiced in a primitive manner from earliest times. Their irrigation systems are very crude, but furnish a water supply sufficient to mature their crops in ordinary seasons. San Felipe has a canal 10 miles long, and in some places 15 feet wide, and 20 feet deep. All of their ditches are kept in good condition. The only pueblos that suffered from a shortage of irrigation water in the census year were San Ildefonso and Sia.

The majority of Pueblo farmers have from 10 to 80 acres each under cultivation, although a few have as high as 60 or 80 acres. Their land is not held by individuals under title of absolute ownership, but is parceled out to each head of a family, the community holding the title.

Their methods of harvesting, threshing, and grinding grain are most antiquated. Wheat is reaped with the sickle, which has been in use for so many centuries; threshing is accomplished by driving the animals over the threshing floor until the grain is trampled from the straw; foreign substances are picked out by hand and the grain washed, much of it being damaged in the process; and the inhabitants of those pueblos which are not situated near flouring mills still grind their grain by crushing it in stone mortars or between stone slabs.

A Pueblo farmer usually has a few horses, cattle, sheep, and occasionally burros, goats, swine, and chickens. Some farmers possess large flocks of sheep. There are very few dairy cows in their herds, cattle being kept almost exclusively for food supply.

ZUNI RESERVATION.

Zuni, the largest pueblo reserve, is situated in the extreme western part of New Mexico, in Valencia county, and lies in a great plain watered by the Zuni River. The original Spanish grant contained 27 square miles, but the reserve has since been greatly enlarged, the present area comprising 336 square miles.

The total population of the Zuni is 1,525; like other Pueblo Indians, they are kind, peaceable, and industrious, and have been a self-supporting, agricultural people ever since they were first met by the white man. Their farms are situated from 15 to 25 miles from the pueblo in small valleys and canyons adjoining the basin in which their village is located. Throughout the growing season they spend most of their time on their farms, returning to the pueblo after the harvest. The majority of the 267 Zuni farms range in size from 10 to 20 acres, although a few contain from 30 to 40 acres each. The larger part of the land is planted in corn, but wheat, beans, sweet corn, onions, melons, and squashes are common crops. The Zuni farmers also possess peach orchards, and usually dry large quantities of fruit, which they store away for use during the winter months. Late frosts destroyed their fruit crop in the census year and no report of their orchards was made. They irrigate their land in a primitive manner but keep their ditches in good repair.

The chief wealth of the Zuni, however, lies in their flocks of sheep, which nearly all possess. They are famous blanket makers, some specimens of their weaving being waterproof and rivalling in quality the blankets of the Navaho Indians. Small numbers of ponies, mules, range cattle, swine, and chickens were reported.

IRRIGATION STATISTICS.

New Mexico lies in the southern part of the Rocky Mountain area, well within the arid region, and embraces 122,460 square miles, or 78,374,400 acres. The territory may properly be divided into three distinct regions—the eastern plains, the Rio Grande Valley, and the western plateaus. The eastern portion is an extension of the high plains of Texas, broken by the head waters of the Canadian and Pecos rivers. This broad stretch of open grazing land continues to the uplands which form the southern extension of the Rocky Mountains of Colorado. Until recently this portion of the territory was the paradise of cattlemen and of outlaws, who alternated the legitimate business of "rounding up" cattle with the less legitimate occupation of keeping out settlers and evading officers of the law. Much of this lawlessness, however, has been broken up by the introduction of irrigation along the Pecos River, the consequent immigration of many farmers, and the building of railroads from the east and south. Beyond this broken country is the Rio Grande Valley, and still farther west the elevated arid table-lands, which have little value even for grazing purposes. These extend to the mountains, which lie about the head waters of the Gila and Salt rivers. In the extreme northwestern part of the territory, where lie the fertile valleys of the San Juan River and its tributaries, there has recently been a considerable development of irrigation.

The Rio Grande, rising in southern Colorado, enters the territory from the north through deep canyons. These widen in places, allowing room for bottom lands, and again the walls die down to low mesas. In the south, where the principal towns and agricultural communities are found, the proportion of low land increases. Here the river tends to spread out over the bottom lands, losing the greater part of its water by evaporation, or by diversion into ditches, and in the lower part of its course, above El Paso, the channel is frequently dry. In the Rio Grande section there are very few large irrigation canals, but many small community ditches supply lands held by the Indians and Mexicans. The origin of these ditches is lost, even in local tradition, and it is probable that many of them were in use before the advent of the white race. The farmers in this valley, among whom those of mixed Spanish and Indian descent predominate, have followed traditional customs, and show little energy or skill. Their lands are tilled in the most laborious fashion, largely by hand, and the returns are small.

Under the community system, each ditch is held and controlled by the owners of the land it irrigates, these living usually together in a village or pueblo. In the fall of each year a mayordomo is elected who has full control of the ditch for the following season. He assesses the land for the labor necessary to clean the ditch and keep it in repair during the irrigation season; apportions the water to each consumer according to the local conditions, and in general supervises all matters pertaining to irrigation. While the apportionment of labor varies, it is generally such that a farmer holding a tract of 6 acres is required to furnish the labor of one man in cleaning and repairing the entire ditch in the spring, while he who holds 12 acres furnishes a man's labor whenever necessary during the whole season. The ditches have no regulating gates or sluices, and flooding is the only means

of irrigation. Consequently, the use of water is extremely wasteful.

The development of the agricultural resources of New Mexico depends largely upon the control of the Rio Grande. On the head waters of this stream in Colorado are a number of canals of sufficient combined capacity to take all of the water. The seepage and inflow from small streams maintain the river to a moderate volume in northern New Mexico, but practically no water penetrates to the southern end of the territory during the irrigation season. Sites suitable for reservoirs along the Rio Grande and its principal tributaries are numerous, and many of them excellent. Large dams constructed at these points would render it possible to hold great quantities of water for the irrigation of a number of open valleys along the course of the river. Some of these reservoir sites have been surveyed.

Irrigation on the eastern plain is of comparatively recent introduction, but this region is destined soon to lead the rest of the territory in the number of acres irrigated. The water supply is drawn from the Canadian and Pecos rivers. The Canadian River, rising on the eastern slope of the Rocky Mountains, flows through a valley 200 miles in length within the territory. Irrigation ditches in this drainage basin are confined almost wholly to the tributaries, the course of the main stream being for the most part through a canyon, from which it does not emerge until it passes the boundary. Important irrigation systems are supplied by the Cimarron, Vermejo, Mora, and Conchas rivers, those on the two first mentioned streams being the most extensive in the territory. Two large canals, constructed by a corporation, are located on the Maxwell Grant, a tract containing 1,491,765 acres of grazing and agricultural lands, and including within its boundaries the head waters of the Canadian, Vermejo, and Cimarron rivers. Along the line of these canals is a series of natural basins or ancient lake beds, favorably situated, in which large quantities of water are stored. Many smaller natural reservoir sites, located at elevations where evaporation is comparatively slight, are found near the head waters of nearly all the streams which originate in this basin. Eleven reservoirs, with a combined capacity of 6,000 acre feet,[1] have been constructed on the Vermejo. On the Cimarron there are 13 individual ditches and 1 corporation ditch. Connected with these are 4 storage reservoirs, with an aggregate capacity of 6,000 acre feet. The area irrigated by the ditches of this stream is 7,629 acres. Mora River and its tributaries supply water for practically all the irrigation systems in Mora county. None of the normal flow of this stream reaches the Canadian River during the irrigating season, and there is a general scarcity of water throughout its entire drainage basin. The insufficient water supply has greatly retarded agricultural development, and has caused the abandonment of many acres of valuable land. As a partial relief from these conditions, two ditches have been built by which, during the periods of greatest scarcity, water is taken from the Rio Del Pueblo in Taos county, and diverted through passes in the mountains. All the ditches along the Mora and its tributaries are either private or community ditches, and the methods of management and distribution are those commonly found in all Mexican settlements.

The Pecos River rises northeast of Santa Fe, in the northern part of the territory, and first becomes a considerable stream at its confluence with the Gallinas near La Junta. As the river has mountain sources, the flow in the upper portion of its basin is perennial; but shortly after it emerges from the highlands, much of its water is lost by seepage, and for several months in the year this part of the river bed is dry. In the lower part of its course in New Mexico, the Pecos receives large quantities of water from numerous springs, which are a notable feature, many of them emerging from the earth with such volume and force as to prove beyond question that they come from the drainage waters of the high, precipitous mountain ranges on the west.

The following are the principal tributaries of the Pecos, many of them furnishing a constant supply: Agua Negra, Agua Negra Chiquita, Rio Hondo, Berenda rivers (North, Middle, and South), the Spring rivers (North and South), Penasco, Seven Rivers, Rocky Arroyo, and Black rivers.

The drainage area or catchment basin of the Pecos River, lying within the territory and available for irrigation purposes, is estimated at 20,000 square miles. It extends across 4 degrees of latitude, with varying altitudes of from 3,000 to 11,000 feet. In the valley between Roswell and the territorial line, many of the lands subject to irrigation are of excellent quality, others are somewhat alkaline. A plentiful supply of water was reported in 1899 by all the irrigators on the upper portion of this river. In Guadalupe county the only ditch reported as not receiving sufficient water is Las Colonias. This ditch, which covers 2,000 acres and in an average year waters 1,500 acres, irrigated only 98 acres in 1899. In Chaves and Eddy counties, the water supply was sufficient for the land under ditch.

In the western plateau region the total number of acres irrigated is small compared with the other two main divisions of the territory. The waters affording supply for this region are the San Juan and its tributaries, the Gila, the Zuni, and the Mimbres rivers. The lands irrigated by the San Juan River are in the northern part of San Juan county. The sources of this river are in the San Juan and La Plata mountains in Colorado, and the affluents which it receives from the south are unimportant. Near the Colorado line, the San Juan has a mean flow of about 960 cubic feet per second. This is augmented by the waters of the Rio de Los Pinos, which has an estimated flow of 80 cubic feet per second. The most important tributary is the Las Animas, which has a normal flow, at a point below Bloomington, of 855 cubic feet per second. The Rio La Plata, another tributary, has an estimated flow of 50 cubic feet per second.

While the flow of all these streams is perennial, it fluctuates with the seasons, being increased by the melting

[1] The acre foot is an amount of water sufficient to cover 1 acre to a depth of 1 foot.

snows in the spring and later by the rains, which usually occur in the latter part of August and in September.

In the drainage basin of the San Juan there are 52 ditches, located as follows: On the Las Animas, 20 ditches, irrigating 7,132 acres; on the San Juan, 19, irrigating 3,999 acres; and on the La Plata, 13, irrigating 3,063 acres. The total area irrigated by the San Juan and its tributaries is 14,734 acres.

The Gila River rises in the Black and Mimbres ranges, and in Grant county flows for the most part through narrow mountain valleys. The total acreage irrigated by it is 5,933 acres. The flow is perennial, and only a small portion is used.

In the northeastern part of Grant county a small acreage is irrigated by the Rio Mimbres. This stream flows southward as far as Deming, then turns abruptly to the east, and discharges its waters upon the Florida plains, where they are lost in the sands.

Between the basins of the San Juan and the Gila rivers, there is a small area drained by the Zuni River. Portions of this area are irrigated by the Zuni Indians.

Of the 78,374,400 acres of land surface in New Mexico, only 5,130,878, or 6.5 per cent, were included in farms in 1899, and only 326,873, or 0.42 per cent, were improved. Of the improved land, 303,438 acres are located outside of the Indian reservations. The importance of irrigation is demonstrated by the fact that in 1899 the irrigated area outside of the Indian reservations was 203,893 acres, or 67.2 per cent of the improved land. In 1889 the corresponding irrigated area was but 91,745 acres. By the building of new ditches and the extension of old ones, the irrigated area of the territory has been augmented 112,148 acres—a net increase of 122.2 per cent.

The relation of irrigation to the various agricultural operations is shown in the following table:

TABLE A.—ACREAGE AND YIELD OF ALL CROPS, AND OF IRRIGATED CROPS, 1899.

CROPS.	ACREAGE.			PRODUCTION.			
	Total.	Irrigated.	Per cent irrigated.	Unit of measure.	Total.	Irrigated.	Per cent irrigated.
All crops	204,028	182,804	89.6				
Corn	41,345	35,928	86.9	Bushels	677,305	619,094	91.4
Oats	15,848	13,322	84.1	Bushels	342,777	300,851	87.8
Wheat	37,907	36,638	96.7	Bushels	603,303	589,185	97.7
Barley	1,110	942	84.9	Bushels	24,107	21,412	88.8
Kafir corn	138	138	100.0	Bushels	4,473	4,473	100.0
Wild, salt, and prairie grasses	19,233	12,828	66.7	Tons	19,155	14,787	77.2
Alfalfa, or lucern	55,467	54,485	98.2	Tons	154,973	153,850	99.3
Grain cut green for hay	4,857	3,867	79.6	Tons	7,871	7,011	89.1
Other hay and forage crops	7,801	6,191	79.5	Tons	14,546	11,900	81.8
Dry beans	3,349	2,902	86.7	Bushels	36,022	32,340	89.8
Dry pease	2,220	1,965	88.5	Bushels	28,071	26,279	93.6
Potatoes	1,122	885	78.9	Bushels	72,613	60,528	83.4
Onions	160	158	98.8	Bushels	25,014	24,807	99.2
Miscellaneous vegetables	3,874	3,697	95.4				
Sugar beets	1,298	1,298	100.0	Tons	[1]3,965	[1]3,965	100.0
Grapes	[2]787	[2]740	94.0	Centals	15,159	14,091	93.0
Orchard fruits	[2]7,219	[2]6,596	91.4	Bushels	267,335	251,294	93.8
Other crops	293	224	76.7				

[1] Quantity sold. [2] Estimated from number of vines or trees.

The total area of land irrigated in 1899 was 203,893 acres, while the total area of irrigated crops, as given above, was 182,804 acres. The difference, 21,089 acres, represents approximately the area of pasture land irrigated. It is probable that a portion of the area upon which crops were reported as grown without irrigation, was in reality irrigated at some time during the year.

Table B presents an exhibit by counties of the number of irrigators and the acreages irrigated, 1889 and 1899.

TABLE B.—NUMBER OF IRRIGATORS AND ACRES IRRIGATED.

COUNTIES.	NUMBER OF IRRIGATORS.			ACRES IRRIGATED.		
	1899.	1889.	Per cent increase.	1899.	1889.	Per cent increase.
The Territory[1]	7,884	3,085	155.6	203,893	91,745	122.2
Bernalillo[2]	624	220	(3)	11,003	4,643	(3)
Chaves[4]	185		(3)	15,790		(3)
Colfax	191	46	(3)	15,002	5,904	(3)
Donna Ana	504	275	(3)	17,242	11,051	(3)
Eddy[4]	84		(3)	6,187		(3)
Grant	273	158	72.8	10,976	5,718	92.0
Guadalupe[5]	99		(3)	1,855		(3)
Lincoln	195	194	(3)	4,038	7,789	(3)
Mora	783	348	(3)	26,530	11,403	(3)
Otero[6]	119		(3)	2,130		(3)
Rio Arriba	815	281	190.0	15,812	6,368	148.3
San Juan	459	256	79.3	14,734	9,510	54.9
San Miguel	907	335	(3)	15,857	9,163	(3)
Santa Fe	694	123	(3)	8,249	1,358	(3)
Sierra	84	65	29.2	2,648	1,417	86.9
Socorro	797	218	(3)	10,567	4,798	(3)
Taos	564	262	115.3	11,858	6,420	84.6
Union[7]	95		(3)	6,479		(3)
Valencia	412	304	35.5	6,941	6,113	13.5

[1] Exclusive of Indian reservations.
[2] Part of Santa Fe county annexed since 1889.
[3] Comparison with figures of 1889 impracticable as important changes in county lines have been made.
[4] Organized from part of Lincoln county in 1891.
[5] Organized from parts of Lincoln and San Miguel counties in 1891.
[6] Organized from parts of Donna Ana, Lincoln, and Socorro counties in 1899.
[7] Organized from parts of Colfax, Mora, and San Miguel counties in 1893.

A glance at the percentages of Table 1 and Table B discloses the intimate relation between the growth of irrigation and the general development of agriculture. The number of farms outside the Indian reservations increased in ten years 145 per cent, the number of irrigators, 155.6 per cent, and the irrigated area, 122.2 per cent.

In Table C the number of irrigated farms is compared with the total number of farms, and the irrigated acreage with the total improved acreage.

TABLE C.—COMPARISON OF IRRIGATED FARMS WITH TOTAL NUMBER OF FARMS, AND OF IRRIGATED ACREAGE WITH IMPROVED ACREAGE, JUNE 1, 1900.

COUNTIES.	NUMBER OF FARMS.			NUMBER OF IMPROVED ACRES IN FARMS.		Per cent improved land irrigated.
	Total.	Irrigated.	Per cent irrigated.	Total.	Irrigated.	
The Territory[1]	10,925	7,884	72.2	303,488	203,893	67.2
Bernalillo	840	624	74.3	18,787	11,003	58.7
Chaves	345	185	53.6	19,068	15,790	82.8
Colfax	410	191	46.6	37,898	15,002	39.6
Donna Ana	571	504	88.3	21,870	17,242	78.8
Eddy	168	84	50.0	8,676	6,187	71.3
Grant	472	273	57.8	14,903	10,976	73.6
Guadalupe	277	99	35.7	3,711	1,855	50.0
Lincoln	345	195	56.5	7,100	4,038	56.9
Mora	933	783	83.9	35,163	26,530	75.4
Otero	180	119	66.1	3,689	2,130	58.5
Rio Arriba	860	815	94.8	18,152	15,812	87.1
San Juan	492	459	93.3	16,157	14,734	91.2
San Miguel	1,297	907	69.9	23,581	15,857	67.4
Santa Fe	918	694	75.6	13,610	8,249	60.6
Sierra	160	84	52.5	8,036	2,648	32.9
Socorro	991	797	80.4	17,728	10,567	59.6
Taos	629	564	89.7	13,889	11,858	85.6
Union	419	95	22.7	9,652	6,479	67.1
Valencia	618	412	66.7	11,973	6,941	58.0

[1] Exclusive of Indian reservations.

Of the farms of the territory, 72.2 per cent were wholly or partially irrigated in 1899, while of the improved acreage 67.2 per cent was irrigated. The average area of improved land in each irrigated farm was 33 acres, of which 26 were irrigated. For Arizona the corresponding averages were 76 acres of improved land, and 60 acres of irrigated land.

Table D presents the principal statistics relating to irrigation ditches.

TABLE D.—NUMBER, LENGTH, AND COST OF IRRIGATION DITCHES REPORTED.

COUNTIES.	IRRIGATION DITCHES.			ACRES OF LAND.		
	Number.	Length in miles.	Cost of construction.	Under ditch.	Irrigated in 1899.	
					Total.	Per mile of ditch.
The Territory[1]	975	2,382	$4,140,819	646,784	203,893	86
Bernalillo	75	238	336,200	72,856	11,003	46
Chaves	27	98	250,334	45,705	15,790	161
Colfax	27	180	207,393	20,880	15,002	115
Donna Ana	14	123	67,600	62,948	17,242	140
Eddy	8	85	2,265,600	92,400	6,187	73
Grant	67	158	154,073	18,530	10,976	69
Guadalupe	15	56	22,251	10,485	1,855	33
Lincoln	41	82	14,946	5,885	4,038	49
Mora	58	181	85,605	52,543	26,530	147
Otero	43	40	13,617	3,087	2,130	53
Rio Arriba	170	198	49,460	49,472	15,812	80
San Juan	55	211	265,000	49,737	14,734	70
San Miguel	53	136	51,290	20,390	15,857	117
Santa Fe	93	107	46,453	17,240	8,249	77
Sierra	31	69	21,850	14,581	2,648	38
Socorro	53	160	48,492	25,292	10,567	66
Taos	69	108	21,000	26,415	11,853	110
Union	32	76	29,035	8,910	6,479	85
Valencia	44	126	100,120	32,868	6,941	55

[1] Exclusive of Indian reservations.

No reports were secured concerning the cost of irrigation ditches on Indian reservations. The statistics presented in Table D relate exclusively to the canals and ditches in the counties outside the reservations.

The average number of acres of irrigated land for each mile of ditch reported is 86. The area under ditch for each mile is 272 acres, or over three times the average irrigated area. In many states, where there is a larger percentage of new irrigation enterprises than in this territory, the area irrigated bears a much smaller ratio to the area under ditch. In the sections of New Mexico where irrigation has been practiced for centuries, the effect on the old canals of the diversion of water at points farther up the streams is shown by the difference between acreage under ditch and acreage actually irrigated. This is especially evident along the Rio Grande. On the other hand, in the valleys of the Pecos and San Juan rivers and their tributaries, the difference is due to the presence of new enterprises which have not been sufficiently developed to furnish water to all the land under them. In the newer districts this difference indicates that an increase in the irrigated area is possible. In the older districts further development without water storage is unlikely.

The average cost of constructing the ditches was $1,738 per mile, $6.40 per acre of land under ditch, and $20.30

per acre of land actually irrigated in 1899. The term water right, as used in Table E, means the first cost, per acre, to the irrigator, of putting water on the land irrigated in 1899, exclusive of the cost of maintenance of the ditch, or of annual water rental. By a glance at the table it will be noticed that the average cost of water right per acre irrigated in 1899 was $6.59, as stated by the owners.

Table E is a comparative exhibit of the average values per acre of irrigated and unirrigated farms and of irrigated land, together with the average cost per acre of water right, and of annual maintenance.

TABLE E.—AVERAGE VALUE PER ACRE OF IRRIGATED AND UNIRRIGATED FARMS, JUNE 1, 1900.

COUNTIES.	AVERAGE VALUE PER ACRE EXCLUSIVE OF BUILDINGS.				AVERAGE COST PER ACRE.	
	All farms.	Unirrigated farms.	Irrigated farms.	Irrigated land.	Water right.	Annual maintenance.
The Territory[1]	$3.36	$1.66	[2]$4.67	$29.26	$6.59	$0.82
Bernalillo	9.00	1.52	13.99	61.73	13.79	1.66
Chaves	12.53	3.37	15.51	37.52	7.87	0.30
Colfax	1.82	1.39	2.57	25.54	10.89	0.40
Donna Ana	17.31	2.50	20.48	21.55	3.60	0.62
Eddy	2.45	1.42	5.26	18.05	9.42	1.25
Grant	12.62	9.19	15.49	35.48	10.71	0.59
Guadalupe	3.26	2.67	4.28	23.58	6.02	0.77
Lincoln	6.70	3.14	10.92	24.07	3.53	0.42
Mora	4.45	2.02	5.45	24.91	1.93	0.71
Otero	8.38	1.90	11.11	23.00	6.45	0.80
Rio Arriba	7.87	1.17	12.17	34.12	2.23	0.36
San Juan	13.79	2.45	14.48	32.24	7.00	0.52
San Miguel	1.74	1.59	1.77	23.38	3.14	0.35
Santa Fe	2.55	1.36	[2]2.80	17.21	5.07	0.21
Sierra	1.33	0.65	7.95	12.10	3.23	1.44
Socorro	4.21	3.48	4.86	65.84	4.12	2.47
Taos	5.50	1.10	6.44	12.59	1.72	0.33
Union	2.66	2.08	3.45	22.43	3.53	0.36
Valencia	7.96	4.19	9.83	27.70	4.60	0.67

[1] Exclusive of Indian reservations.

[2] One irrigated farm in Santa Fe county having a total area of 500,000 acres, only 1,000 of which are irrigated, causes the low average valuation of irrigated farms. The other 693 farms, having a total area of 24,277 acres, have an average valuation of $21.40 per acre.

Of the 12,311 farms in the territory, including those in Indian reservations, 9,128 are irrigated, and 3,183 are unirrigated. The acres in the irrigated farms number 2,892,855; in the unirrigated, 2,238,023. The value of all land in the irrigated farms, not including buildings, is $13,551,592, and in the unirrigated, $3,772,117. The value of all buildings on irrigated farms is $2,775,532, and on the unirrigated, $789,573. Live stock on the irrigated farms has a value of $15,785,760, and on the unirrigated, $15,941,640. Irrigated farms are, in number, 74.1 per cent of the total for the territory; in acreage, 56.4; in value of land and improvements, exclusive of buildings, 78.2; in buildings, 77.8; in implements and machinery, 75.9; in live stock, 49.7; and in total farm wealth, 64.5.

The average size of all farms, exclusive of those held by Indians, is 464 acres, and that of irrigated farms, 360 acres. The average area of irrigated land in each irrigated farm is 26 acres. For farms making use of irrigation the average value of products not fed to live stock is $2.13 per acre. The unirrigated farms make greater use of the public domain for grazing purposes than do those which are irrigated, and an income is thus secured in addition to that obtained directly from the land owned and leased. In the unirrigated districts large areas of public land are fenced by cattlemen, although the title rests wholly with the Government. Nevertheless, for unirrigated farms, the average value per acre of products not fed to live stock is only $1.79.

The average value per acre for irrigated land is $29.26, while that for the best irrigated alfalfa land is from $50 to $100 per acre. The value of irrigated fruit land frequently runs as high as $400 per acre, and occasionally reaches $500.

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 168. WASHINGTON, D. C. May 15, 1902.

MANUFACTURES.

FLAX, HEMP, AND JUTE PRODUCTS.

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

SIR: I transmit herewith, for publication in bulletin form, a report on the manufacture of flax, hemp, and jute products for the census year 1900, prepared under my direction by Mr. Edward Stanwood, of Boston, acting in the capacity of an expert special agent of the division of manufactures. This is the first time this manufacture has been made the subject of a special report.

The statistics of the three branches of the industry—cordage and twine, jute and jute goods, and linen goods—are presented separately in the tables under the respective designations, the totals being combined in the first four tables.

Table 1 is a comparative summary of the statistics of the industry for 1890 and 1900; Table 2 is a summary of the industry by states for 1900; Table 3 shows the kind, quantity, and cost of the various materials used in 1900; Table 4 is a summary of the kind, quantity, and value of products in 1900; Table 5 is a comparative summary of the statistics for cordage and twine from 1880 to 1900; Table 6 shows the kind, quantity, and cost of materials used for cordage and twine in 1900; Table 7 shows the kind, quantity, and value of the products for cordage and twine in 1900; Table 8 is a summary of the statistics for jute and jute goods for 1900; Table 9 shows the materials used for jute and jute goods for 1900; Table 10 shows the kind, quantity, and value of the products for jute and jute goods for 1900; Table 11 is a comparative summary of the statistics for linen goods for 1890 and 1900; Table 12 shows the kind, quantity, and cost of principal materials used for linen goods in 1900; Table 13 shows the kind, quantity, and value of the principal products for linen goods for 1900; and Table 14 is a detailed summary for flax, hemp, and jute products by states for 1900.

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

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

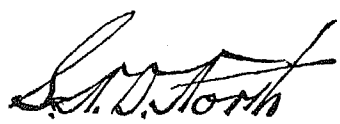
entire year may have resulted in a variation in the number, and should be considered in making comparisons.

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

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

The reports show a capital of $41,991,762 invested in the manufacture of flax, hemp, and jute products in the 141 establishments reporting for the United States. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations engaged in this industry. The value of the products is returned at $47,601,607, to produce which involved an outlay of $957,190 for salaries of officials, clerks, etc.; $6,331,741 for wages; $2,678,286 for miscellaneous expenses, including rent, taxes, etc.; and $32,197,885 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of flax, hemp, and jute products during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

Very respectfully,



Chief Statistician for Manufactures.

FLAX, HEMP, AND JUTE PRODUCTS.

By EDWARD STANWOOD, *Expert Special Agent.*

The industries which make use of the three classes of vegetable fibers, flax, hemp, and jute, are closely allied, in that most of them employ more than one of these materials. For example, there is a large consumption of hemp both by jute manufacturers and by those classed as makers of linen goods; and there is a consumption of all three fibers by cordage and twine establishments. If it were possible, it would be more scientific to classify the several industries by the character of the goods produced, but the variety and diversity of products are so great that it is impossible to do so. The plan here adopted is to group all the industries reported at the Eleventh Census under the separate heads of cordage and twine, jute and jute goods, linen goods, and linen thread, in one general survey, and to bring the facts relating to each branch into view by separate treatment.

Table 1 is a comparative summary of the statistics of the industry as a whole in 1890 and 1900.

TABLE 1.—FLAX, HEMP, AND JUTE PRODUCTS; COMPARATIVE SUMMARY, 1890 AND 1900.

	1900	1890
Number of establishments	141	162
Capital	$41,991,762	$27,731,649
Salaried officials, clerks, etc., number	641	[1]458
Salaries	$957,190	[1]$609,170
Wage-earners, average number	20,903	15,519
Total wages	$6,331,741	$4,872,389
Men, 16 years and over	9,996	7,367
Wages	$3,824,556	$2,952,270
Women, 16 years and over	8,648	6,923
Wages	$2,174,152	$1,788,289
Children, under 16 years	2,259	1,229
Wages	$333,034	$186,830
Miscellaneous expenses	$2,678,286	$1,481,932
Cost of materials used	$32,197,885	$26,148,344
Value of products	$47,601,607	$37,313,021

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900. (See Table 14.)

The only inference that may fairly be drawn from Table 1 is that, upon the whole, there has been an increase in these industries. It would be a statistical absurdity to place reliance upon the percentages of increase of masses, which include things widely different in their nature, and sums made up of great numbers and small.

Table 2 is a summary of the industry by states for 1900.

TABLE 2.—FLAX, HEMP, AND JUTE PRODUCTS; SUMMARY BY STATES: 1900.

	United States.	Alabama.	Connecticut.	Kentucky.	Massachusetts.	New Jersey.
Number of establishments	141	4	8	6	28	6
Capital	$41,991,762	$298,448	$297,962	$459,295	$10,223,490	$3,413,163
Salaried officials, clerks, etc., number	641	10	5	23	136	57
Salaries	$957,190	$10,980	$3,500	$26,024	$203,943	$80,551
Wage-earners, average number	20,903	282	265	492	4,693	2,127
Total wages	$6,331,741	$47,643	$69,544	$149,937	$1,562,862	$624,988
Miscellaneous expenses	$2,678,286	$14,654	$6,443	$39,847	$601,542	$223,118
Cost of materials used	$32,197,885	$166,145	$196,332	$341,515	$7,539,433	$1,760,426
Value of products	$47,601,607	$253,560	$312,446	$602,701	$11,338,933	$2,955,844

	New York.	Ohio.	Pennsylvania.	Rhode Island.	Wisconsin.	All other states.[1]
Number of establishments	22	9	21	5	5	27
Capital	$10,311,768	$2,147,677	$6,162,509	$95,947	$213,565	$3,367,938
Salaried officials, clerks, etc., number	148	47	90	4	11	110
Salaries	$306,331	$54,205	$103,788	$2,670	$8,840	$156,358
Wage-earners, average number	5,450	1,052	2,683	84	128	3,647
Total wages	$1,713,614	$317,909	$761,582	$22,175	$35,085	$1,026,402
Miscellaneous expenses	$782,719	$96,471	$147,126	$8,052	$7,574	$750,740
Cost of materials used	$7,516,240	$2,325,907	$5,448,323	$63,954	$109,016	$6,730,594
Value of products	$11,674,669	$2,957,674	$7,256,548	$108,715	$185,168	$9,905,351

[1] Includes states having less than 3 establishments, in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; California, 2; Delaware, 1; Georgia, 1; Illinois, 2; Indiana, 1; Iowa, 1; Kansas, 1; Maine, 2; Maryland, 1; Michigan, 1; Minnesota, 1; Mississippi, 1; Missouri, 2; New Hampshire, 1; North Carolina, 2; Oregon, 1; South Carolina, 1; Tennessee, 2; Texas, 2.

Tables 3 and 4 present, in accordance with trade classifications, the several fiber materials entering into the manufacture of flax, hemp, and jute goods, both the quantity and the cost, respectively; also the quantity and value of the goods produced therefrom.

TABLE 3.—FLAX, HEMP, AND JUTE PRODUCTS; KIND, QUANTITY, AND COST OF MATERIALS USED: 1900.

	Pounds.	Cost.
Total	545,449,566	$32,197,885
Fibers:		
Hard:		
Hemp:		
Manila	123,241,820	8,916,493
Sisal	146,352,853	8,827,131
New Zealand	6,344,371	352,528
Soft:		
Hemp:		
Russian:		
Rough	1,175,605	73,165
Tow	118,090	5,869
Line	349,558	25,063
Italian:		
Rough	7,329,346	533,922
Tow	305,917	20,969
Line	335,858	31,780
American:		
Rough	11,497,068	536,076
Tow	3,201,011	112,134
Line	1,276,262	65,675
Flax:		
European:		
Rough	5,580,911	668,446
Tow	3,727,163	252,759
Line	3,388,641	806,698
Canadian:		
Rough	1,972,820	155,751
Tow	247,350	18,908
Line	181,736	20,643
Domestic:		
Rough	700,000	25,750
Tow	744,045	66,665
Line	487,980	65,247
Jute	87,443,201	2,431,429
Jute butts	118,806,625	1,795,653
Yarns:		
Flax or hemp:		
Domestic tow:		
Wholly or partly bleached	120,320	14,060
Gray	48,500	6,860
Domestic line:		
Wholly or partly bleached	107,490	45,550
Gray	157,778	32,396
Imported tow:		
Wholly or partly bleached	37,514	9,681
Gray	196,941	35,178
Imported line:		
Wholly or partly bleached	1,000	180
Gray	108,976	48,747
Linen, unspecified	102,622	42,005
Cotton	4,973,080	709,889
Jute	1,009,651	69,504
Silk	4,774	24,414
Spun silk	1,100	3,450
Worsted	682	308
Cotton:		
Raw (26,540 bales)	13,022,755	849,426
Waste	793,182	37,692
All other materials		4,459,796

TABLE 4.—FLAX, HEMP, AND JUTE PRODUCTS; KIND, QUANTITY, AND VALUE OF PRODUCTS: 1900.

	Quantity.	Value.
Total		$47,601,607
Flax or hemp yarns:		
Tow:		
Dry spun, gray, pounds	1,889,528	248,351
Dry spun, bleached, pounds	18,371	3,478
Wet spun, gray, pounds	6,060,092	804,908
Wet spun, bleached, pounds	49,236	11,361
Line:		
Dry spun, gray, pounds	218,088	46,500
Dry spun, bleached, pounds	23,138	11,078
Wet spun, gray, pounds	1,200	300
Jute yarns, pounds	54,271,850	3,230,835
Twines for sale:		
All flax, pounds	3,845,978	969,469
All hemp, pounds	9,065,024	1,019,590
All jute, pounds	1,679,127	117,589
Flax or hemp, mixed with jute, pounds	12,924,067	1,101,208
Linen thread, pounds	4,021,044	2,332,287
Binder twine:		
All manila, pounds	15,261,174	$1,546,428
Chiefly manila, pounds	24,975,568	2,316,257
All or chiefly sisal, pounds	125,372,687	10,322,896
Rope:		
Manila, pounds	83,347,459	8,330,113
Sisal, pounds	46,865,604	3,682,670
Jute, pounds	10,012,165	463,413
Cotton, pounds	1,615,824	247,250
Towels and toweling:		
All linen, square yards	4,598,615	471,633
Partly linen, square yards	2,051,247	281,258
Other woven fabrics:		
All linen, square yards	88,000	9,110
Partly linen, square yards	135,000	34,000
Jute burlaps, square yards		336,129
Jute carpets and rugs, square yards	2,953,658	357,563
Gunny bagging, square yards	74,090,760	3,462,479
Other spun or woven goods		1,051,689
Cotton:		
Bagging, square yards	248,204	21,864
Yarn, pounds	946,567	98,928
Twine, pounds	8,691,707	1,133,640
Batting, pounds	198,000	7,125
Waste, pounds	1,254,619	20,146
Other products of cotton		715,613
All other products		2,744,504

CORDAGE AND TWINE.

Three general classes of establishments are included in the following statistics under the head of cordage and twine. The first and smallest, having regard to the items of capital, number of wage-earners, wages, and value of products, consists of those whose chief business is the manufacture of yarn—cotton, for the most part, but also linen and silk—into the finer varieties of twine and into cotton rope; the second, of those which produce binder twine on a large scale; the third, of those which manufacture hempen rope. Since no useful purpose would be served by separating the returns of these several classes they are reported together; but the important facts regarding the several industries, so far as they are distinct, are easily ascertained from the statistics of the quantity and value of the fibers consumed, and of the quantity and value of the several products. At previous censuses no special inquiry was made concerning any of the characteristic features of the industries grouped under this head, and no facts were reported other than those which appear in the following comparative summary:

TABLE 5.—CORDAGE AND TWINE; COMPARATIVE SUMMARY, 1880 TO 1900.

	1900	1890	1880
Number of establishments	105	150	105
Capital	$29,275,470	$23,351,883	$7,140,475
Salaried officials, clerks, etc., number	436	[1] 414	[2]
Salaries	$666,936	[1] $560,639	[2]
Wage-earners, average number	13,114	12,385	5,485
Total wages	$4,113,112	$3,976,232	$1,558,676
Men, 16 years and over	7,341	6,412	2,926
Wages	$2,751,787	$2,547,985	[2]
Women, 16 years and over	4,797	5,010	1,480
Wages	$1,212,823	$1,280,065	[2]
Children, under 16 years	976	963	1,029
Wages	$148,502	$148,182	[2]
Miscellaneous expenses	$1,716,205	$1,020,697	[3]
Cost of materials used	$26,632,006	$24,051,666	$9,330,261
Value of products	$37,849,651	$33,312,559	$12,492,171

[1] Includes proprietors and firm members, with their salaries; number only reported in 1900.
[2] Not reported separately.
[3] Not reported.

The tendency toward a consolidation of small establishments and the transaction of business on a larger scale was observable ten years ago, when a decreased number of establishments reported a capital more than threefold greater than in 1880, and a value of products nearly threefold greater. At the census of 1900 the number of separate establishments declined, as compared with 1890, almost one-third, yet the value of products was larger. The statistics of capital are not strictly comparable, since the method of ascertaining the amount has been different at each census. The fact of an increase may be inferred, but the rate of increase can not properly be deduced from the figures given. This is also true respecting the returns of the average number of persons employed, the method of ascertaining such average having been changed. In general, it appears that the number of wage-earners has not increased greatly, if at all, within the last decade.

The kind, quantity, and cost of the materials used in the production of cordage and twine, and the quantity and value of the several products are presented in Tables 6 and 7.

TABLE 6.—CORDAGE AND TWINE; KIND, QUANTITY, AND COST OF MATERIALS USED: 1900.

	Pounds.	Cost.
Total	418,416,811	$26,632,006
Cotton:		
Raw (26,540 bales)	13,022,755	849,426
Yarn	3,860,285	505,041
Waste	798,182	37,692
Flax fiber:		
European:		
Rough	757,672	76,615
Tow	345,959	23,191
Line	54,592	7,243
Canadian:		
Rough	768,021	56,688
Tow	49,457	3,188
Domestic:		
Rough	200,000	24,000
Tow	703,943	61,186
Line	487,980	65,247
Linen yarn	299,135	88,625
Hemp:		
Manila	123,241,820	8,916,493
Sisal	146,352,858	8,827,131
New Zealand	6,344,371	352,528
Russian:		
Rough	1,175,605	73,165
Tow	44,090	1,969
Line	349,558	25,063
Italian:		
Rough	3,422,104	256,582
Tow	305,917	20,969
Line	296,920	27,752
American:		
Rough	10,871,865	506,767
Tow	3,011,004	104,660
Line	1,258,266	63,965
Jute	25,767,800	786,967
Butts	74,281,100	1,107,899
Yarns:		
Jute	339,051	21,070
Silk	4,774	24,414
Spun	1,100	3,450
Worsted	682	308
All other materials	.....	3,714,812

TABLE 7.—CORDAGE AND TWINE; KIND, QUANTITY, AND VALUE OF PRODUCTS: 1900.

	Quantity.	Value.
Total	.....	$37,849,651
Twine:		
Cotton, pounds	8,691,707	1,133,640
Flax, pounds	2,187,540	602,471
Hemp, pounds	8,299,902	895,074
Jute, pounds	1,589,127	111,239
Flax or hemp, mixed with jute, pounds	12,924,067	1,101,203
Binder twine:		
Manila, pounds	15,261,174	1,546,428
Chiefly manila, pounds	24,975,568	2,316,257
All or chiefly sisal, pounds	125,372,687	10,322,896
Rope:		
Cotton, pounds	1,615,824	247,250
Manila, pounds	83,347,459	8,330,113
Sisal, pounds	46,865,604	3,682,670
Jute, pounds	5,717,317	250,760
Gunny bagging, square yards	41,310,695	2,035,636
Jute burlap	.....	150,000
Yarn:		
Cotton, pounds	946,567	98,928
Flax and hemp, tow, pounds	2,552,955	345,913
Flax and hemp, line, pounds	10,000	4,800
Jute, pounds	9,554,188	621,687
Linen thread, pounds	100,000	17,000
Waste, pounds	1,254,619	20,146
Batting and wadding, pounds	198,000	7,125
Other spun or woven goods	6,241,449	534,265
All other products, cotton	.....	715,613
All other products	.....	2,758,537

JUTE AND JUTE GOODS.

The jute manufacture was represented at the Tenth Census by 4 establishments only, having a total capital of $415,000, and products valued at $696,982. Seven establishments were reported at the Eleventh Census under the head of jute and jute goods. It is probable, however, that some which were classed as "bagging, flax, hemp, and jute" are, in the reports for 1900, included in the class of jute and jute goods, since it appears that only 2 of the 18 establishments now making returns have come into existence during the decade. Under these circumstances a comparison of the statistics for 1900 with those of former census years would be misleading. The principal facts relating to the industry for 1900 are presented in the following summary:

TABLE 8.—JUTE AND JUTE GOODS: 1900.

Number of establishments	18
Capital	$7,027,293
Salaried officials, clerks, etc., number	88
Salaries	$147,313
Wage-earners, average number	4,506
Total wages	$1,181,790
Men, 16 years and over	1,611
Wages	$579,877
Women, 16 years and over	2,064
Wages	$480,782
Children, under 16 years	831
Wages	$121,181
Miscellaneous expenses	$574,986
Cost of materials used	$3,015,362
Value of products	$5,383,797

Table 9 shows the kind, quantity, and cost of the materials employed in the manufacture.

TABLE 9.—JUTE AND JUTE GOODS; KIND, QUANTITY, AND COST OF MATERIALS USED: 1900.

	Pounds.	Cost.
Total	109,049,701	$3,015,362
Jute	61,603,929	1,642,318
Butts	44,525,525	637,754
Yarns	670,600	48,434
Hemp:		
Italian	1,363,431	33,303
American	584,328	27,354
Cotton yarn	301,888	33,334
All other materials		492,305

Table 10 presents a classification of the principal products of the establishments reporting.

TABLE 10.—JUTE AND JUTE GOODS; KIND, QUANTITY, AND VALUE OF PRODUCTS: 1900.

	Quantity.	Value.
Total		$5,383,797
Jute yarn ....pounds..	44,717,672	2,609,148
Twine ....do....	90,000	6,300
Rope ....do....	4,294,848	212,658
Burlaps ....square yards..	4,361,685	236,129
Gunny bagging ....do....	32,780,065	1,426,843
Carpets and rugs ....do....	2,953,658	357,568
Flax or hemp yarns ....pounds..	1,286,155	165,788
Other spun or woven goods		364,821
All other products		4,547

LINEN MANUFACTURE.

The report upon the linen industry at the census of 1890 was most meager. Three establishments only producing linen goods were included in the general summary of manufactures; 2 others which made linen thread came under the rule which forbids the separate tabulation of less than 3 establishments, and were placed under "all other industries." Inasmuch as both classes of establishments are reported together in the following tables, the facts relating to the 5 establishments reporting in 1890 are now published for the first time for purposes of comparison.

TABLE 11.—LINEN GOODS; COMPARATIVE SUMMARY: 1890 AND 1900.

	1900.	1890.
Number of establishments	18	5
Capital	$5,688,999	$2,734,130
Salaried officials, clerks, etc., number	117	[1]26
Salaries	$142,941	[1]$25,530
Wage-earners, average number	3,283	1,940
Total wages	$1,036,839	$527,572
Men, 16 years and over	1,044	648
Wages	$492,891	$255,409
Women, 16 years and over	1,787	1,193
Wages	$480,597	$256,187
Children, under 16 years	452	99
Wages	$63,351	$15,976
Miscellaneous expenses	$337,095	$242,977
Cost of materials used	$2,550,517	$1,594,769
Value of products	$4,368,159	$2,880,341

[1]Includes proprietors and firm members, with their salaries; number only reported in 1900.

Inasmuch as the tables deal with so small a number of establishments, many of them still in the period of experiment, no deduction is justified or would be safe, further than that the industry has expanded greatly.

The materials used, consisting of hemp, flax, jute, and cotton, in great variety and in various stages of manufacture, are summarized in Table 12.

TABLE 12.—LINEN GOODS; KIND, QUANTITY, AND COST OF MATERIALS USED: 1900.

	Pounds.	Cost.
Total	17,983,084	$2,550,517
Hemp:		
Russian:		
Tow	74,000	3,900
Italian:		
Rough	2,543,811	194,037
Line	38,938	4,028
American:		
Rough	40,875	1,955
Tow	190,007	7,474
Line	17,996	1,710
Flax:		
European:		
Rough	4,823,239	591,831
Tow	3,381,204	229,568
Line	3,334,049	799,450
Canadian:		
Rough	1,204,799	99,063
Tow	197,893	15,720
Line	131,736	20,643
Domestic:		
Rough	500,000	1,750
Tow	40,102	2,479
Flax or hemp yarn	582,006	151,132
Cotton yarn	810,957	171,014
Jute	71,472	2,144
All other materials		252,619

Table 13 shows the kind, quantity, and value of the principal products during the census year of the establishments reporting.

TABLE 13.—LINEN GOODS; KIND, QUANTITY, AND VALUE OF PRODUCTS: 1900.

	Quantity.	Value.
Total		$4,368,159
Flax or hemp yarn, tow ....pounds..	4,178,117	556,392
Flax or hemp yarn, line ....do....	232,426	53,078
Twine, all flax ....do....	1,658,438	366,998
Twine, all hemp ....do....	765,122	124,516
Linen thread ....do....	3,921,044	2,315,287
Towels and toweling, all linen ....square yards..	4,598,615	471,633
Towels and toweling, partly linen ....do....	2,051,247	281,258
Other woven fabrics, all linen ....do....	83,000	9,110
Other woven fabrics, partly linen ....do....	135,000	34,000
Other spun or woven goods		152,603
All other products		3,284

The linen industry has never obtained a firm foothold in the United States. In colonial times efforts were made to promote the growth of flax, and to introduce the spinning and weaving of the fiber. It was the policy of the mother country to repress manufactures in the colonies, but the production of linen goods was a domestic industry, which England could not and did not try to prevent. The cultivation of flax was undertaken on a small scale, and the spinning wheel and the hand-loom were the only available machinery for working it into cloth. It is probable that there was in America

scarcely any manufacture of linen for sale. That which was made was a home product intended solely for consumption in the families of the weavers. The factory system had not been generally established even on the other side of the Atlantic. Nevertheless flax was already cultivated on a generous scale in many districts of Ireland, France, Germany, and other countries, and large numbers of persons were employed in preparation of the fiber and manufacture of linen for the market.

It is extremely probable that the desire of the American people to introduce manufactures, thus supplementing their political with industrial and commercial independence, would have led them to engage largely in the production of linen fabrics had not the invention of the cotton gin by Eli Whitney (patented in 1793) placed in their hands a fiber cheaper than flax, more tractable, requiring less care in preparation, more easily spun and woven, superior for many purposes and decidedly inferior for very few. At all events, the effort to introduce the linen manufacture was practically abandoned for the time being, and, until recently, the attempts to establish it in the United States have been spasmodic and unsuccessful. The difficulties in the path of manufacturers are many. There is, to speak broadly, no American production of fiber suitable for spinning. Flax is grown in great quantities, but it is cultivated chiefly for the seed and not for the fiber.

The process of retting involves the expenditure of too much time and labor to be profitable to American farmers. Consequently it is necessary to rely almost wholly upon foreign importations for the raw material. Moreover, the intermediate processes of manufacture, as well as the spinning and weaving of a fiber greatly lacking in elasticity, require so much skill and care that the margin of profit is precarious. And finally, the demand for the finished product is far from being so broad and imperative as is that for articles of cotton, wool, and silk. Linen is indispensable for fine fabrics for the dining table, for thread and twine where great strength is required, and for the best quality of toweling; but for the thousand and one uses to which ordinary cloth is put, cotton would be generally preferred by consumers, even if the cost were the same.

It will be inferred from these statements that the linen industry in the United States at the present time is not extensive, nor does the prospect seem bright. Nevertheless, measured by percentages, the increase during the last ten years has been great. There are certain fields which American manufacturers can occupy to advantage. There is a large demand for linen carpet-yarns; our immense shoe manufacturing industry requires a great quantity of linen thread; and the market for towels and toweling is practically unlimited. The first two of these fields our manufacturers have occupied for many years. The third they have entered more generally during the past ten years than ever before. This was rendered possible by a readjustment of tariff rates in the act of 1897. The duty on the yarns required for such branches of the manufacture as Americans now think it expedient to engage in, was reduced to a revenue basis, and the duty on manufactured goods was raised.

The manufacture of linen toweling, which shows the largest extension of any branch of linen manufacture during the decade, is not fully reported in the general tables. Several large cotton manufacturing establishments have engaged in this industry; and although their use of nearly one and a half million pounds of linen yarn is reported among the materials consumed, the schedules issued to them made no provision for a separate report of the character, quantity, or value of their linen products.

Table 14 is a detailed statement of the statistics for flax, hemp, and jute products, by states, for 1900.

TABLE 14.—FLAX, HEMP, AND JUTE PRODUCTS, BY STATES: 1900.

	United States.	Alabama.	Connecticut.	Kentucky.	Massachusetts.	New Jersey.
Number of establishments	141	4	8	6	28	6
Established during the decade	40	4	1	2	9	2
Established during the census year	5				1	
Capital:						
Total	$41,991,762	$298,448	$297,962	$459,295	$10,228,490	$3,413,163
Land	$2,457,349	$27,026	$8,000	$1,500	$191,974	$252,421
Buildings	$5,146,574	$45,951	$25,300	$40,200	$1,298,786	$794,320
Machinery, tools, and implements	$9,789,559	$169,976	$85,400	$202,789	$1,839,725	$851,805
Cash and sundries	$24,598,280	$55,495	$179,262	$214,806	$6,598,005	$1,514,617
Proprietors and firm members	100		7	7	16	1
Salaried officials, clerks, etc.:						
Total number	641	10	5	23	136	57
Total salaries	$957,190	$10,980	$8,500	$26,024	$208,948	$80,551
Officers of corporations:						
Number	145	7	2	5	25	5
Salaries	$422,046	$8,040	$1,950	$10,000	$92,741	$15,700
General superintendents, managers, clerks, and salesmen:						
Total number	496	3	3	18	111	52
Total salaries	$585,144	$2,940	$1,550	$16,024	$111,202	$64,851
Men:						
Number	442	3	2	16	95	51
Salaries	$509,158	$2,940	$1,050	$15,244	$102,630	$64,212
Women:						
Number	54		1	2	16	1
Salaries	$25,986		$500	$780	$8,572	$639

TABLE 14.—FLAX, HEMP, AND JUTE PRODUCTS, BY STATES: 1900—Continued.

	United States.	Alabama.	Connecticut.	Kentucky.	Massachusetts.	New Jersey.
Wage-earners, including pieceworkers, and total wages:						
Greatest number employed at any one time during the year	24,947	306	274	588	5,195	2,332
Least number employed at any one time during the year	17,588	258	251	389	4,075	1,963
Average number	20,903	282	265	492	4,693	2,127
Wages	$6,331,741	$47,643	$69,544	$149,937	$1,562,862	$624,988
Men, 16 years and over:						
Average number	9,996	89	142	285	2,649	656
Wages	$3,824,555	$25,771	$48,016	$109,746	$1,020,085	$295,008
Women, 16 years and over:						
Average number	8,648	105	120	162	1,770	1,009
Wages	$2,174,152	$13,525	$25,988	$34,176	$490,991	$271,744
Children, under 16 years:						
Average number	2,259	88	3	45	274	462
Wages	$333,034	$8,347	$540	$6,015	$51,786	$58,236
Miscellaneous expenses:						
Total	$2,678,286	$14,654	$6,443	$39,847	$601,542	$223,118
Rent of works	$158,753	$775	$887	$3,530	$7,170	$600
Taxes, not including internal revenue	$222,670	$1,749	$1,782	$1,633	$85,334	$34,569
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$2,270,745	$12,130	$4,274	$34,684	$506,884	$187,949
Contract work	$26,118	----	----	----	$2,154	----
Materials used:						
Total cost	$32,197,885	$166,145	$196,332	$341,515	$7,539,433	$1,760,426
Principal materials	$27,746,312	$151,668	$179,168	$309,278	$6,782,696	$1,616,754
Fuel	$390,746	$5,557	$2,212	$6,145	$106,986	$28,645
Rent of power and heat	$19,343	----	$306	----	$4,965	$4,563
Mill supplies	$736,820	$3,877	$6,208	$7,169	$278,951	$54,756
All other materials	$3,001,923	$2,300	$209	$10,190	$343,642	$45,219
Freight	$302,741	$2,743	$8,229	$8,733	$22,193	$10,489
Products:						
Total value	$47,601,607	$253,560	$312,446	$602,701	$11,388,933	$2,955,844

	New York.	Ohio.	Pennsylvania.	Rhode Island.	Wisconsin.	All other States.[1]
Number of establishments	22	9	21	5	5	27
Established during the decade	4	3	5	----	1	9
Established during the census year	----	----	1	----	----	3
Capital:						
Total	$10,311,768	$2,147,677	$6,162,509	$95,947	$213,565	$8,367,988
Land	$422,704	$65,415	$441,671	$3,000	$25,000	$718,638
Buildings	$925,858	$272,751	$686,950	$15,000	$26,870	$1,064,588
Machinery, tools, and implements	$2,734,491	$624,270	$1,233,540	$39,226	$102,310	$1,906,027
Cash and sundries	$6,228,715	$1,185,241	$3,850,348	$38,721	$59,385	$4,678,685
Proprietors and firm members	15	2	25	7	6	14
Salaried officials, clerks, etc.:						
Total number	148	47	90	4	11	110
Total salaries	$306,331	$54,205	$103,788	$2,670	$8,840	$156,358
Officers of corporations:						
Number	30	11	8	----	4	48
Salaries	$156,755	$17,250	$31,700	----	$2,760	$85,150
General superintendents, managers, clerks, and salesmen:						
Total number	118	36	82	4	7	62
Total salaries	$149,576	$36,955	$72,088	$2,670	$6,080	$71,208
Men:						
Number	104	32	72	4	7	56
Salaries	$142,627	$34,999	$67,960	$2,670	$6,080	$68,746
Women:						
Number	14	4	10	----	----	6
Salaries	$6,949	$1,956	$4,128	----	----	$2,462
Wage-earners, including pieceworkers, and total wages:						
Greatest number employed at any one time during the year	6,439	1,574	2,919	112	142	5,066
Least number employed at any one time during the year	4,428	764	2,331	57	115	2,957
Average number	5,450	1,052	2,683	84	128	3,647
Wages	$1,713,614	$317,909	$761,582	$22,175	$35,085	$1,026,402
Men, 16 years and over:						
Average number	2,657	725	1,089	38	46	1,620
Wages	$1,039,333	$255,095	$449,927	$11,694	$17,291	$557,589
Women, 16 years and over:						
Average number	2,312	315	1,083	46	61	1,665
Wages	$592,893	$60,766	$238,628	$10,481	$15,779	$419,181
Children, under 16 years:						
Average number	481	12	511	----	21	362
Wages	$81,388	$2,048	$73,027	----	$2,015	$49,632
Miscellaneous expenses:						
Total	$782,719	$96,471	$147,126	$8,052	$7,574	$750,740
Rent of works	$125,234	$1,151	$2,600	$2,150	$44	$15,112
Taxes, not including internal revenue	$40,915	$10,174	$7,526	$246	$1,103	$37,639
Rent of offices, insurance, interest, and all sundry expenses not hitherto included	$616,570	$85,146	$114,603	$4,089	$6,427	$697,989
Contract work	----	----	$22,397	$1,567	----	----
Materials used:						
Total cost	$7,516,240	$2,325,907	$5,448,323	$63,954	$109,016	$6,730,594
Principal materials	$6,781,255	$2,170,059	$3,298,823	$57,423	$103,050	$6,296,138
Fuel	$116,905	$20,915	$29,091	$707	$2,136	$71,447
Rent of power and heat	$8,012	----	$60	$750	----	$687
Mill supplies	$164,676	$28,709	$95,079	$656	$1,757	$94,982
All other materials	$412,079	$46,923	$1,950,491	$4,131	$700	$186,039
Freight	$33,313	$59,301	$74,779	$287	$1,373	$81,301
Products:						
Total value	$11,674,669	$2,957,674	$7,256,548	$108,715	$185,166	$9,905,351

[1] Includes states having less than 3 establishments in order that the operations of individual establishments may not be disclosed. These establishments are distributed as follows: Arkansas, 1; California, 2; Delaware, 1; Georgia, 1; Illinois, 2; Indiana, 1; Iowa, 1; Kansas, 1; Maine, 2; Maryland, 1; Michigan, 1; Minnesota, 1; Mississippi, 1; Missouri, 2; New Hampshire, 1; North Carolina, 2; Oregon, 1; South Carolina, 1; Tennessee, 2; Texas 2.

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 169. WASHINGTON, D. C. May 19, 1902.

AGRICULTURE.

HAWAII.

Hon. WILLIAM R. MERRIAM,

Director of the Census.

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics of agriculture for the territory of Hawaii, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that—

> The schedules relating to agriculture shall comprehend the following topics: Name of occupant of each farm, color of occupant, tenure, acreage, value of farm and improvements, acreage of different products, and number and value of live stock. All questions as to quantity and value of crops shall relate to the year ending December thirty-first next preceding the enumeration.

A "farm," as defined by the Twelfth Census, includes all the land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It also includes the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The census of agriculture in Hawaii was taken in the summer of 1900 by a corps of special agents, under the direction of Hon. Alatau T. Atkinson, of Honolulu, special agent in charge of the enumeration of the population. The figures presented in this bulletin comprise the first statistics of agriculture in Hawaii secured by a United States Census.

The farms of Hawaii, June 1, 1900, numbered 2,273, and were valued at $60,029,956. Of this amount, $3,545,895, or 5.9 per cent, represents the value of buildings, and $56,484,061, or 94.1 per cent, the value of land and improvements other than buildings. On the same date the value of farm implements and machinery was $11,484,890, and of live stock, $2,570,142. These values, added to that of farms, give the "total value of farm property," $74,084,988, an average agricultural investment per inhabitant of $481.07.

The products derived from domestic animals, poultry, and bees, including animals sold and animals slaughtered on farms, are referred to in this bulletin as "animal products." The total value of such products, together with the value of all crops, is termed "total value of farm products." This value for the census year was $22,040,731, an average of $143.12 for each inhabitant of the islands. Of the above amount, $623,215, or 2.8 per cent, represents the value of animal products, and $21,417,516, or 97.2 per cent, the value of crops, including forest products cut or produced on farms.

The value of "all farm products," as here given, represents substantially the value of "net farm products," defined by the census as the amount obtained by deducting from the "total value of farm products" the value of the products fed to live stock on the farms of the producers. In Hawaii products are so seldom fed to stock on the farms of the actual producers, that no reports of such feeding were submitted.

As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained, no statement of net farm income can be given.

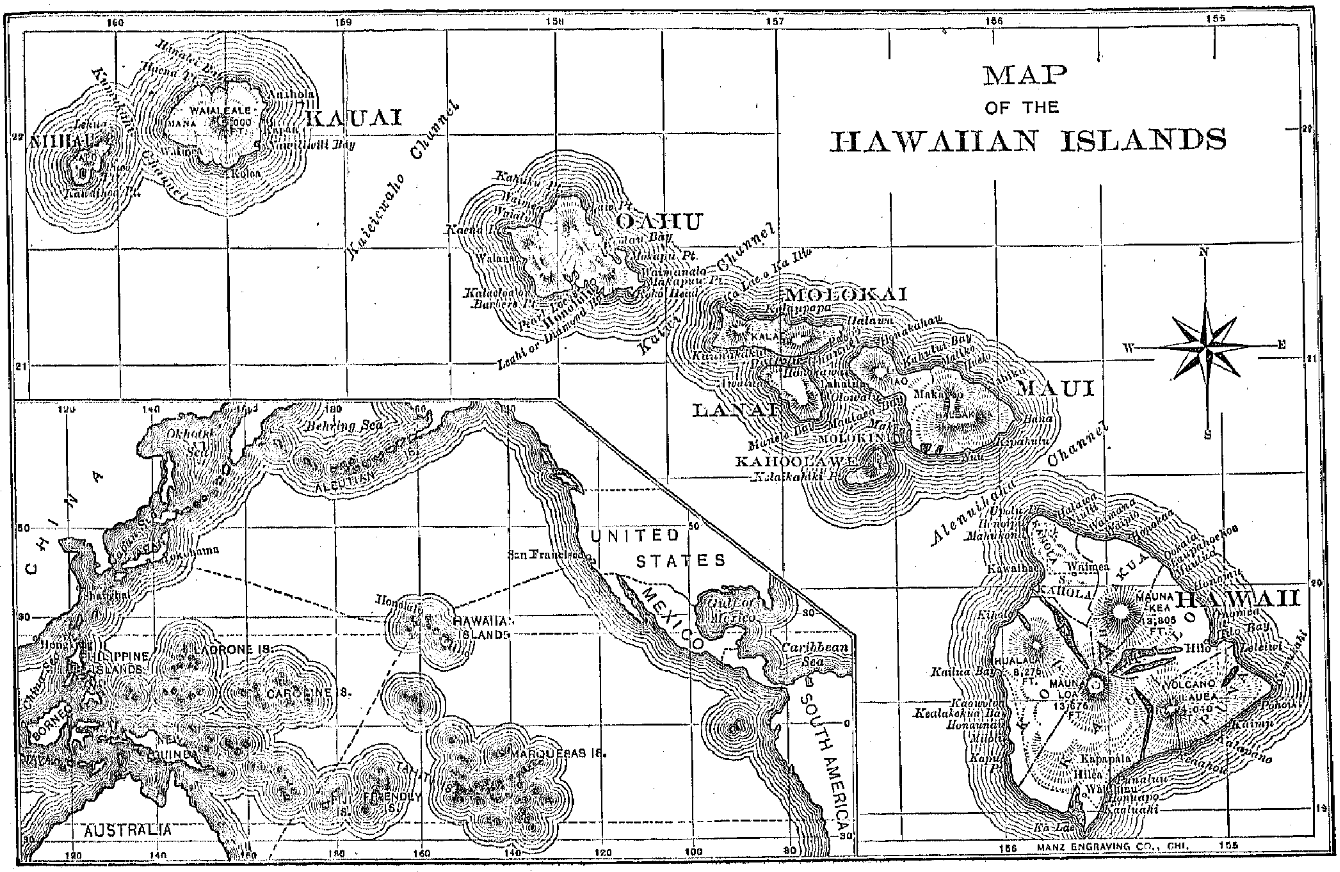
The length of time required in the transmission of mails to and from the islands, made impracticable any extensive correspondence on the subject of irrigation upon which a detailed treatment might have been based. The importance of irrigation as a factor in the agricultural development of the islands, however, has been plainly set forth in the discussion and tables which conclude the bulletin.

There is included in this bulletin, a map of the Hawaiian Islands, for the use of which we are indebted to the United States Department of Agriculture. The map, it is believed, will be helpful in locating the island districts and other territorial divisions herein mentioned.

Very respectfully,

L. G. Powers.

Chief Statistician for Agriculture.


MAP
OF THE
HAWAIIAN ISLANDS
NIIHAU
KAUAI
Kaieiewaho Channel
OAHU
MOLOKAI
LANAI
MAUI
KAHOOLAWE
Alenuihaha Channel
HAWAII
MAUNA KEA 13,805 FT.
VOLCANO KILAUEA
Hilo
N
S
E
W
Behring Sea
ALEUTIAN IS.
UNITED STATES
San Francisco
MEXICO
Gulf of Mexico
Caribbean Sea
SOUTH AMERICA
CHINA
HAWAIIAN ISLANDS
LADRONE IS.
CAROLINE IS.
PHILIPPINE ISLANDS
BORNEO
MARQUESAS IS.
AUSTRALIA
MANZ ENGRAVING CO., CHI.

AGRICULTURE IN HAWAII

GENERAL STATISTICS.

In accordance with the provisions of an act of Congress approved April 30, 1900, the Hawaiian Islands, originally acquired by the United States under the act of Congress approved July 7, 1898, became a terrritory of the United States, June 14, 1900, with the name "Territory of Hawaii."

The territory of Hawaii consists of a group of 20 islands which lie in the North Pacific Ocean, 2,100 miles from San Francisco to the south and west and more than 2,000 miles from the nearest mainland. The main islands of the group form a chain, running from northwest to southeast, and extending over a distance of 390 miles from the westernmost point of Niihau to the eastern extremity of the island of Hawaii. It lies within longitude 154° 40′ and 160° 30′ west, and latitude 22° 16′ and 18° 55′ north.

The islands comprised in the territory are as follows: Hawaii, Maui, Oahu, Kauai, Molokai, Lanai, Niihau, Kahoolawe, Kaula, Molokini, Lehua, Bird, Necker, Johnson, Laysan, Lysianski, Ocean, Midway, Pearl Reef, and French Frigate Shoal. Of these, only the 7 first named are inhabited. A few shepherds formerly resided upon the island of Kahoolawe, and kept large flocks of sheep upon the 30,000 acres of grazing land which the island afforded. With the exhaustion of the pasturage the shepherds left, and at the date of the census enumeration in 1900 the island was uninhabited. Since that time plans have been formulated for introducing hardy grasses, with a view of reëstablishing sheep ranches. The other 12 islands are mere rocks and coral reefs, which workmen occasionally visit for the purpose of collecting eggs and the guano deposits which are found there in great abundance.

According to recent measurements made by the United States Coast Survey, the land surface of the territory, exclusive of the 12 uninhabitable islands, comprises 6,538.1 square miles. Hawaii, the largest of the group and the second in point of population, has an area of 4,004 square miles. Occupying a vast area in the central portion of the island, are the three great volcanoes, Mauna Kea, Mauna Loa, and Hualalai, ranging in height from 13,805 feet to 8,275 feet. Although the presence of these three volcanoes and their vast fields of lava-flow render barren the major portion of its land surface, Hawaii leads all other islands of the group in richness and diversity of soil and in wealth of resources. More than forty per cent of the sugar production of the territory in 1899 came from this island's fertile cane fields, while some of the finest coffees to be found are grown in the districts of Kona and Kamakua.

Second in size is the island of Maui, with an area of 721.9 square miles. Its land surface, like that of the island of Hawaii, is to a large extent untillable, owing to the presence of 2 mountain ranges. The larger range contains one of the world's greatest extinct volcanoes, Haleakala, which rises to an elevation of 10,032 feet above the level of the sea. The fertile valleys between these mountains, and the arable levels at their outside bases, afford some of the most productive areas in the group, sugar culture and stock raising being the most extensive industries.

Third in size, but first in productiveness per acre, is the island of Oahu, which has an area of 597.8 square miles. Honolulu, the capital of the territory, and the principal seaport of the group, is located upon the southern coast of this island.

The areas in square miles of the remaining islands are as follows: Kauai 595.4, Molokai 257.8, Lanai 173.6, Niihau 104.5, and Kahoolawe 83.1. Lanai and Niihau are given over almost entirely to grazing, thousands of horses, sheep, goats, and cattle feeding upon their grassy levels. Upon the island of Molokai is located the government hospital for lepers, established in 1870. This institution is situated upon a tract of about 8,300 acres, occupying a projection on the north shore. Owing to its precipitous heights and the general rocky nature of the surface, there is but little farming done on the island. The raising of live stock and the cultivation of taro receive the greatest attention. An attempt made by the American Sugar Company to establish an extensive plantation in the lowlands along the southern shore, has proven a costly, and as yet an unsuccessful, experiment. Many thousands of dollars were expended during 1899, and subsequently, in the prosecution of the enterprise, but the failure to secure an adequate supply of fresh water for irrigation purposes caused the abandonment of the project.

Geologically the island group is of volcanic origin and of comparatively recent formation. The soil is composed almost wholly of basaltic lavas in various stages of decomposition. The most important islands contain large areas of very fertile land, the most productive being the lowlands where the soil, sedimentary in its nature, has been deposited to great depths by the action of the rainfall. This fertility of the soil is associated with the most favorable climatic conditions, and as a result the agricultural possibilities of the islands are nowhere surpassed in so limited an area.

NUMBER AND SIZE OF FARMS.

The following table gives the number of farms, the total, improved, and unimproved acreages, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1900.

YEAR.	Number of farms.	NUMBER OF ACRES IN FARMS.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.		
				Forest land.	Pasture land.[1]	
1900[2]	2,273	2,609,613	294,545	717,764	1,597,304	11.3

[1] The pasture land reported consists for the most part of grazing areas which never have been put under the plow, and is, therefore, classed with the unimproved land.
[2] No complete statistics of farms or farm areas were secured prior to 1900.

The number of farms in 1900 was 2,273, of which 2,111, or 92.9 per cent, reported buildings. The total area in farms, 2,609,613 acres, comprises 62.4 per cent of the total land surface of the 8 principal islands, distributed as follows: 38.2 per cent in pasturage, 17.2 per cent in forest area, and 7.0 per cent in improved land. Considerably less than one-third of the improved land is devoted to crops, so that only about two per cent of the total land surface is under cultivation.

The average area of the farms was 1,148.1 acres. The large holdings of the sugar planters, together with extensive sheep ranches, account for this large average. There are many small agricultural holdings in the islands, however, especially among the farms operated by tenants.

It is probable that the number of farms and also the acreage of farm land have been steadily increasing, as in recent years thousands of acres of pasture land have been utilized for growing sugar cane, and many marshes have been reclaimed for the cultivation of rice.

Some of the larger farms contain great tracts of lava and other waste lands, which were, as a rule, included by the enumerators under the head of forest lands, as they could not properly be classed either as improved land or as pasture land. In making comparisons based upon the average land values and productiveness of the different islands, account must be taken of the fact that these waste lands constitute a large percentage of the farm acreage of some islands, while in others they are very inconsiderable in extent. Consideration must be given, also, to the relative areas of cheap grazing lands, which are very extensive in some islands, and comparatively limited in others.

ISLAND STATISTICS.

Table 2 gives an exhibit of general agricultural statistics by islands.

TABLE 2.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899, AND EXPENDITURES OF 1899 FOR LABOR AND FERTILIZERS, BY ISLANDS.

ISLANDS.	NUMBER OF FARMS.		ACRES IN FARMS.[1]			VALUE OF FARM PROPERTY.				Value of all products.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Pasture.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
The Territory	2,273	2,111	2,609,613	294,545	1,597,304	$56,481,061	$3,545,895	$11,484,890	$2,570,142	$22,040,731	$7,913,166	$1,352,847
Hawaii	954	909	1,747,213	142,618	1,122,085	16,495,470	1,148,950	2,379,340	1,305,360	8,562,888	2,788,140	591,600
Kauai	399	387	236,275	51,888	88,986	11,552,710	582,810	2,672,620	328,637	4,854,222	1,778,620	287,940
Lanai	2	2	94,960	2,960	86,500	692,500	42,500	107,500	57,575	29,290	62,650	260
Maui	383	312	240,016	58,095	124,494	14,468,700	994,920	3,035,510	477,927	4,085,516	1,419,170	225,360
Molokai	27	21	107,879	536	95,973	341,780	36,520	900	61,563	51,149	113,690	
Niihau	1	1	60,000	1,000	30,000	45,000	5,000	1,000	39,150	10,000	3,000	
Oahu	507	479	123,270	37,448	49,266	12,887,901	735,195	3,288,020	299,930	4,447,666	1,747,896	244,687

[1] Forest area may be obtained by subtracting from total the sum of improved and pasture acreage.

The island of Hawaii is the largest of the group, and also the most important from an agricultural point of view. It contains 42.0 per cent of the total number of farms in the territory, 67.0 per cent of the total area in farms, 48.4 per cent of all the improved land, and 70.2 per cent of the acreage in pasture. The value of its farm land and improvements, except buildings, constitutes 29.2 per cent of the total for the territory, and that of its live stock, 50.8 per cent of the aggregate live-stock value of the territory.

The value of the island's farm products in 1899, constituted 38.8 per cent of the total value of products for the territory, and its expenditures for labor and fertilizers constituted 35.2 per cent and 43.9 per cent, respectively, of the total expenditures for the group.

It surpasses every other island in number of farms, farm area, value of farm property, and value of products.

The island of Oahu has only about one-fifteenth the farm acreage reported for Hawaii, but has over one-half as many farms. This difference is due to the number of small rice, taro, and vegetable farms operated in the vicinity of Honolulu. With an area of but little more than one-fourth as much improved land, Oahu produced crops having a value more than half as great as was reported for Hawaii, indicating that its improved area is more intensively cultivated.

The portion of the land surface included in farms on each of the islands is as follows: Hawaii, 68.2 per cent; Kauai, 62.0 per cent; Lanai, 85.5 per cent; Maui, 51.9 per cent; Molokai, 65.4 per cent; Niihau, 89.7 per cent;

and Oahu, 32.2 per cent. The high percentages for Lanai and Niihau are accounted for by the fact that these islands are given over almost wholly to live-stock raising, there being a ranch of 90,000 acres on the former and one of 60,000 on the latter. This fact explains, also, the relatively low expenditures for labor and fertilizers on these islands.

FARM PROPERTY AND PRODUCTS.

Table 3 gives, by islands, the average size of farms, the average value per acre, the average value of farm property, the average value of crops produced, and the average expenditure per farm for labor and for fertilizers.

TABLE 3.—NUMBER OF FARMS, THEIR AVERAGE SIZE AND AVERAGE VALUE PER ACRE, TOGETHER WITH AVERAGE VALUE OF FARM PROPERTY, AVERAGE VALUE OF ALL PRODUCTS, AND AVERAGE EXPENDITURES PER FARM FOR LABOR AND FOR FERTILIZERS, BY ISLANDS.

ISLANDS.	Number of farms.	Average acreage of farms.	Average value of land per acre.	Average value per farm of farm property.	Average value per farm of all products.	AVERAGE EXPENDITURE PER FARM—	
						For labor.	For fertilizers.
The Territory	2,273	1,148.1	$21.64	$32,593	$9,697	$3,481	$595
Hawaii	954	1,831.5	9.44	22,358	8,976	2,923	623
Kauai	399	592.2	48.89	37,937	12,166	4,458	722
Lanai	2	47,480.0	7.29	450,038	14,645	31,325	130
Maui	383	626.7	60.28	49,548	10,667	3,705	588
Molokai	27	3,995.5	3.17	16,325	1,894	4,211	------
Niihau	1	60,000.0	0.75	90,150	10,000	3,000	------
Oahu	507	243.1	104.55	33,947	8,773	3,447	483

From the above table it will be seen that the average farm of the territory contains 1,148.1 acres, valued at $32,593, or $21.64 per acre, and that it produced in 1899, crops and animal products valued at $9,697, while the expenditures for labor and fertilizers amounted to $3,481 and $595, respectively. The average expenditure for labor is greater than the average value of products per farm in any of the states or other territories of the United States.

FARM TENURE.

Table 4 is an exhibit of farm tenure for 1900, showing the number and per cent of farms operated by owners and by tenants. Tenants are divided into two groups: "Cash tenants," who pay a rental in cash or a stated amount of labor or farm produce, and "share tenants," who pay as rental a stated share of the products. In Table 5 the tenure of farms in 1900 is given by race of farmer, and farms operated by owners are subdivided into three groups designated as farms operated by "owners," "part owners," and "managers." These groups comprise, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and lease the remainder from other parties or from the Government; and (3) farms operated by individuals who receive from the owners or lessees a fixed remuneration for their supervision and other services.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES, JUNE 1, 1900.

YEAR.	Total number of farms.	NUMBER OF FARMS OPERATED BY—			PER CENT OF FARMS OPERATED BY—		
		Owners.[1]	Cash tenants.	Share tenants.	Owners.[1]	Cash tenants.	Share tenants.
1900[2]	2,273	951	1,255	67	41.8	55.2	3.0

[1] Including "part owners" and "managers."
[2] No complete statistics of farms by tenure were secured prior to 1900.

TABLE 5.—FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER, WITH PERCENTAGES.

PART 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE.	Total number of farms.	Owners.	Part owners.	Managers.	Cash tenants.	Share tenants.
The Territory	2,273	684	139	128	1,255	67
White	509	271	41	92	98	7
Hawaiian[1]	488	287	73	7	104	17
Colored[2]	1,276	126	25	29	1,053	43
Hawaiian	431	259	61	5	94	12
Part Hawaiian	57	28	12	2	10	5
Chinese	742	83	20	28	589	22
Japanese	531	40	5	1	464	21
South Sea Islander	1	1	------	------	------	------
Negro	2	2	------	------	------	------

PART 2.—PER CENT OF FARMS OF SPECIFIED TENURES.

The Territory	100.0	30.1	6.1	5.6	55.2	3.0
White	100.0	53.2	8.0	18.1	19.3	1.4
Hawaiian[1]	100.0	58.8	15.0	1.4	21.3	3.5
Colored[2]	100.0	9.9	1.9	2.3	82.5	3.4
Hawaiian	100.0	60.1	14.1	1.2	21.8	2.8
Chinese	100.0	11.2	2.7	3.8	79.4	2.9
Japanese	100.0	7.5	0.9	0.2	87.4	4.0

[1] Including Hawaiian and "Part Hawaiian."
[2] Including Chinese, Japanese, South Sea Islanders, and negroes.

No complete census as to farm tenure having been taken prior to 1900, it is impossible to show the exact increases or decreases in the number of farms of each tenure.

All available data point to the conclusion, however, that there has been an increase in every class of tenure during the past decade, and that the greatest increase in any one class has been in that of cash tenants. There has been a substantial gain also in the number of farms operated by managers, although on June 1, 1900, their number was only 128, or but 5.6 per cent of the total number of farm operators.

The different classes of farm operators are distributed among the islands as follows: Owners, Hawaii 364, Kauai 57, Maui 150, Molokai 13, and Oahu 100; part owners, Hawaii 79, Kauai 10, Lanai 1, Maui 31, Molokai 5, and Oahu 13; managers, Hawaii 49, Kauai 26, Lanai 1, Maui 19, Molokai 1, Niihau 1, and Oahu 31; cash tenants, Hawaii 434, Kauai 300, Maui 171, Molokai 2, and Oahu 348; share tenants, Hawaii 28, Kauai 6, Maui 12, Molokai 6, and Oahu 15.

Table 5, giving tenure of farmers by race, shows that whites and Hawaiians operate an approximately equal number of farms, and that "colored" farmers (mainly Chinese and Japanese) operate about two and one-half times

as many as either of the above groups singly. White and Hawaiian owners, also, are approximately equal in number, together making up about 81.5 per cent of all owners. Farms operated by cash tenants are the most numerous of any single class shown in Table 5, and are almost double the number of farms operated by owners, the class second in importance. Cash tenants are mainly "colored," 1,053, or about 84 per cent of the total number being Chinese and Japanese, with a slight preponderance of the former.

OWNERSHIP OF FARM LANDS.

Table 6 presents an exhibit, by race of farmer and by tenure, of the acreages of lands owned, lands leased from the government, and lands leased from private individuals and corporations.

TABLE 6.—NUMBER AND ACREAGE OF FARMS BY RACE AND TENURE OF FARMER, SHOWING DIVISION OF OWNED AND LEASED LAND, AND SOURCE OF LEASEHOLD, JUNE 1, 1900, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Total number of farms.	NUMBER OF ACRES.			PER CENT OF ACREAGE.		
		Owned.	Leased from government.	Leased from private persons.	Owned.	Leased from government.	Leased from private persons.
The Territory	2,273	1,126,458	849,632	633,523	43.2	32.5	24.3
White	509	1,021,496	666,841	393,940	49.1	32.0	18.9
Hawaiian[1]	488	97,673	168,831	220,725	20.0	34.7	45.3
Colored[2]	1,276	7,289	13,957	18,858	18.2	34.8	47.0
White:							
Owners	271	222,009			100.0		
Part owners	41	20,529	49,356	48,402	17.4	41.7	40.9
Managers	92	778,958	617,087	337,319	44.9	35.6	19.5
Cash tenants	98		398	7,840		4.8	95.2
Share tenants	7			379			100.0
Hawaiian:							
Owners	259	17,009			100.0		
Part owners	61	4,762	5,670	5,087	30.7	36.5	32.8
Managers	5	68,265	101,200	171,065	20.1	29.7	50.2
Cash tenants	94		1,604	12,005		11.8	88.2
Share tenants	12			101			100.0
Part Hawaiian:							
Owners	28	1,054			100.0		
Part owners	12	6,459	8,360	25,624	16.0	20.7	63.3
Managers	2	124	52,000	6,000	0.2	89.5	10.3
Cash tenants	10			759			100.0
Share tenants	5			84			100.0
Chinese:							
Owners	88	5,194			100.0		
Part owners	20	1,260	4	1,628	43.6	0.1	56.3
Managers	28	250	113	3,254	6.9	3.1	90.0
Cash tenants	589		1,447	9,654		13.0	87.0
Share tenants	22			803			100.0
Japanese:							
Owners	40	508			100.0		
Part owners	5	56		66	45.9		54.1
Managers	1		12,000			100.0	
Cash tenants	464		393	3,196		11.0	89.0
Share tenants	21			257			100.0
South Sea Islander:							
Owners	1	8			100.0		
Part owners							
Managers							
Cash tenants							
Share tenants							
Negro:							
Owners	2	13			100.0		
Part owners							
Managers							
Cash tenants							
Share tenants							

[1] Including Hawaiian and "Part Hawaiian."
[2] Including Chinese, Japanese, South Sea Islanders, and negroes.

In 1894 the Republic of Hawaii, by an amendment to its constitution, declared the "crown lands" of the islands to be the property of the Hawaiian Government. By the Land act of 1895, these lands were consolidated with those which had previously been known as "government lands" under the general designation of "public lands." Of these original "crown lands" there remain 920,583 acres, and of the "government lands" 789,532 acres, making a total of 1,710,115 acres, valued at $3,480,400, now classed as "public land." According to the report of the governor of Hawaii for 1901, only 1,371,232 acres are now under lease, from which the government receives an annual rental of $76,802. As this area contains many great expanses of mountainous and forest lands, unsuitable for agriculture, only 62.0 per cent of it is reported as being included in the territory's 2,273 farms. Were statistics available showing the status of the land holdings at the time of the passage of the "Land act of 1895," a comparison of the same with the exhibit given in the above table would show that both the number and average size of farms operated by owners have been very materially increased during the intervening period. This movement has received much encouragement under the present land system, as the law provides five methods by which land may be acquired. They are: "Homestead lease," "right of purchase lease," "cash freehold," "special agreement," and "cash sales."

Of the 2,609,613 acres in farms, June 1, 1900, 1,759,981 acres, or 67.5 per cent, were owned by private individuals or by corporations, and 849,632 acres, or 32.5 per cent, by the government. Of the government land in farms, 782,400 acres, or 92.1 per cent, were included in the farms operated by the 128 managers—72.6 per cent in those of *Hawaiians*, and 7.6 per cent in those of all others, mainly "Part Hawaiians." This leased area included some of the most productive cultivated land, as well as some of the most valuable grazing lands in the territory. White farmers controlled 78.5 per cent of the farm lands leased from the government, and 62.2 per cent of the lands leased from private persons.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 7 and 8 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 7.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER, AND BY TENURE, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	2,273	1,148.1	2,609,613	100.0	$74,084,988	100.0
White farmers	509	4,090.9	2,082,277	79.8	68,238,547	92.1
Hawaiian farmers	431	897.4	386,768	14.8	1,897,005	2.6
Part Hawaiian farmers	57	1,762.5	100,464	3.9	527,269	0.7
Chinese farmers	742	31.8	23,607	0.9	2,946,905	4.0
Japanese farmers	531	31.0	16,476	0.6	473,248	0.6
South Sea Islander farmers	1	8.0	8	(1)	514	(1)
Negro farmers	2	6.5	13	(1)	2,500	(1)
Owners	684	359.3	245,795	9.4	2,129,029	2.9
Part owners	139	1,275.3	177,263	6.8	1,408,782	1.9
Managers	128	16,778.4	2,147,635	82.3	67,840,613	91.5
Cash tenants	1,255	29.7	37,296	1.4	2,427,272	3.3
Share tenants	67	24.2	1,624	0.1	279,292	0.4

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

TABLE 8.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE VALUE OF PRODUCTS, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (value of all products of 1899).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$24,850	$1,560	$5,053	$1,130	$9,697	29.8
White farmers	102,032	6,048	22,343	3,676	38,528	28.7
Hawaiian farmers	3,154	353	27	868	689	15.7
Part Hawaiian farmers	5,961	752	72	2,465	1,152	12.5
Chinese farmers	3,337	208	116	215	2,470	62.2
Japanese farmers	740	85	19	47	440	49.4
South Sea Islander farmers	200	300		14	530	103.1
Negro farmers	700	525		25	855	28.4
Owners	2,266	398	39	410	652	20.9
Part owners	7,928	616	92	1,469	1,391	13.7
Managers	403,276	22,925	88,859	14,905	155,541	29.3
Cash tenants	1,575	179	52	130	1,087	56.2
Share tenants	3,556	376	91	146	1,916	46.0

The total value of the farm property of white operators constitutes 92.1 per cent of the total farm property of the territory. The average area of their farms is 2,328.4 acres in excess of that of the farms of the part Hawaiians, who have the next highest average. The Chinese farmers, 82.3 per cent of whom are tenants, operate less than one-sixteenth as much land as the Hawaiians, who rank second in the matter of total farm area, but the total value of their holdings, $2,945,905, exceeds that of the Hawaiians by $1,048,900. This total, however, is considerably in excess of the actual wealth of the Chinese farmers of Hawaii, as the value of the farm property of the 83 Chinese owners is but $212,620.

The value of farm property belonging to the first of the six classes of farm operators, designated as "owners," is $2,129,029, and constitutes 2.9 per cent of the value of all farm property. This amount is distributed among the several races as follows: White, $1,404,949; Hawaiian, $394,369; part Hawaiian, $72,034; Chinese, $212,620; Japanese, $42,043; South Sea Islander, $514; and negro, $2,500. The value of the farms operated by individuals owning a part of the land and leasing the remainder, was $1,408,782, or 1.9 per cent of the total value of all farms. The farms operated by salaried managers had an aggregate value of $67,840,613, or 91.5 per cent of the grand total. The cash tenants operated farms with property worth $2,427,272, or 3.3 per cent of all. The share tenants are the least important of the several classes, the value of their farm holdings being only $279,292, or barely 0.4 per cent of the total.

The farms operated by managers contain 82.3 per cent of the total farm area; 60.5 per cent of this land is leased either from the government or from private individuals or corporations. The major portion consists of large tracts devoted to the cultivation of sugar and rice, and vast areas utilized for grazing. A limited portion consists of small holdings operated by Chinese. The value of the land in the 128 managed farms is 10.9 times that of the remaining 2,145 farms. The managers expend 13.1 times as much for labor as all other farm operators combined, and secure products with a value 9.3 times as great.

FARMS CLASSIFIED BY AREA.

Tables 9 and 10 present the principal statistics for farms classified by area.

TABLE 9.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

AREA.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	2,273	1,148.1	2,609,613	100.0	$74,084,988	100.0
Under 3 acres	492	1.6	788	(1)	281,631	0.4
3 to 9 acres	717	5.2	3,714	0.2	783,672	1.1
10 to 19 acres	371	13.5	4,998	0.2	679,024	0.9
20 to 49 acres	285	29.4	8,375	0.3	1,072,294	1.4
50 to 99 acres	129	66.6	8,586	0.3	832,200	1.1
100 to 174 acres	66	117.5	7,753	0.3	642,036	0.9
175 to 259 acres	35	214.6	7,511	0.3	599,443	0.8
260 to 499 acres	41	335.8	13,766	0.5	772,579	1.0
500 to 999 acres	21	677.8	14,233	0.6	566,937	0.8
1,000 acres and over	116	21,895.6	2,539,889	97.3	67,855,169	91.6

(1) Less than one-tenth of 1 per cent.

TABLE 10.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE VALUE OF PRODUCTS, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (value of all products of 1899).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$24,850	$1,560	$5,053	$1,130	$9,697	29.8
Under 3 acres	415	94	10	53	274	47.9
3 to 9 acres	893	157	21	82	554	50.7
10 to 19 acres	1,458	222	42	108	827	45.2
20 to 49 acres	3,018	388	118	238	2,073	55.1
50 to 99 acres	5,087	761	127	476	2,826	43.8
100 to 174 acres	8,127	788	320	493	3,009	30.9
175 to 259 acres	14,427	1,656	317	727	2,927	17.1
260 to 499 acres	14,084	1,468	2,311	981	6,950	36.9
500 to 999 acres	21,432	2,350	880	2,856	8,510	31.5
1,000 acres and over	444,449	24,799	97,106	18,604	167,948	28.7

The group of farms, each containing 1,000 acres or over, comprises by far the largest percentage of total farm area, and represents a correspondingly high percentage of the total value of farm property.

With slight variations the average values of the several forms of farm property, given in Table 9, advance as the farms increase in size.

It will be observed that the average value of buildings in no case exceeds that of land and improvements other than buildings. This relationship, particularly in the groups of smallest farms, is exceptional, and is accounted for by the

fact that most of the smaller farms consist of submerged rice and taro lands, on which there are few buildings other than structures for the storage of tools and implements.

The total value of farm property for farms containing from 20 to 49 acres is disproportionately high because of the large number of intensively cultivated rice, coffee, and taro farms included in this group.

The average gross incomes per acre for the various groups are as follows: Farms under 3 acres, $171.23; 3 to 9 acres, $106.89; 10 to 19 acres, $61.36; 20 to 49 acres, $70.56; 50 to 99 acres, $42.45; 100 to 174 acres, $25.62; 175 to 259 acres, $13.64; 260 to 499 acres, $20.70; 500 to 999 acres, $12.56; and 1,000 acres and over, $7.67.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

In Tables 11 and 12 farms are classified by principal source of income. If the value of the sugar cane raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of all products, the farm is classified as a sugar farm. If rice is the leading crop, constituting 40 per cent of the value of the products, it is a rice farm. The farms of the other groups are classified in accordance with the same general principle. The "miscellaneous" farms reported are, for the most part, those whose operators do not derive 40 per cent of their income from any one class of farm products. Farms with no income reported for 1899 are classified according to the agricultural operations upon other farms in the immediate vicinity.

TABLE 11.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

PRINCIPAL SOURCE OF INCOME.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	2,273	1,148.1	2,609,613	100.0	$74,084,988	100.0
Taro	441	42.9	18,922	0.7	562,499	0.8
Vegetables	101	21.2	2,139	0.1	117,938	0.2
Fruit	116	12.2	1,417	0.1	182,279	0.2
Live stock	198	7,280.4	1,441,529	55.2	4,529,174	6.1
Dairy produce	34	117.0	3,979	0.2	131,180	0.2
Tobacco	22	1.5	33	(1)	16,415	(1)
Coffee	512	137.1	70,218	2.7	1,932,915	2.6
Rice	500	33.0	16,513	0.6	2,588,114	3.5
Sugar	170	6,136.0	1,043,117	40.0	63,708,629	86.0
Miscellaneous	179	65.6	11,746	0.4	315,845	0.4

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

TABLE 12.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE VALUE OF PRODUCTS WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (value of all products of 1899).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$24,850	$1,560	$5,053	$1,130	$9,697	29.8
Taro	968	186	15	107	425	33.3
Vegetables	834	163	28	143	357	30.6
Fruit	1,181	223	27	140	491	31.2
Live stock	16,022	1,032	154	5,667	2,260	9.9
Dairy produce	1,889	478	43	1,448	1,108	28.7
Tobacco	683	58	1	4	225	30.2
Coffee	3,083	469	63	160	568	15.0
Rice	4,417	376	167	216	3,273	63.2
Sugar	285,549	16,104	66,583	6,521	113,306	30.2
Miscellaneous	1,416	190	31	127	452	25.6

For the several classes of farms the average values per acre of all products are as follows: For farms deriving their principal income from tobacco, $150.00; rice, $99.11; fruit, $40.16; sugar, $18.47; vegetables, $16.87; taro, $9.90; dairy produce, $9.47; coffee, $4.14; live stock, $0.31; and miscellaneous, $6.89. These averages are based upon the total acreage of the farms of each class and not upon the areas under cultivation, hence they must not be considered as indices of the comparative value of the various products.

The wide variations shown in the averages and in the percentages of gross income upon investment are due largely to the fact that in computing gross income no deduction is made for expenditures. For sugar plantations, rice farms, and taro farms, the average expenditure for such items as labor, fertilizers, irrigation, etc., represents a far greater percentage of the gross income than in the case of "live stock," "tobacco," or "miscellaneous" farms. Were it possible to present the average net income, the variations shown would be comparatively slight.

FARMS CLASSIFIED BY REPORTED VALUE OF TOTAL PRODUCTS.

Tables 13 and 14 present data relating to farms classified by reported value of all products in 1899.

TABLE 13.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF ALL PRODUCTS OF 1899, WITH PERCENTAGES.

VALUE OF ALL PRODUCTS OF 1899.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The Territory	2,273	1,148.1	2,609,613	100.0	$74,084,988	100.0
$0	52	939.1	48,833	1.9	5,249,470	7.1
$1 to $49	75	21.8	1,634	(1)	102,120	0.1
$50 to $99	144	13.9	1,998	0.1	131,190	0.2
$100 to $249	533	23.7	12,634	0.5	540,630	0.7
$250 to $499	477	21.4	10,193	0.4	593,610	0.8
$500 to $999	402	96.8	38,906	1.5	852,490	1.2
$1,000 to $2,499	299	253.0	75,648	2.9	1,723,180	2.3
$2,500 and over	291	8,315.4	2,419,767	92.7	64,892,298	87.6

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

TABLE 14.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE VALUE OF PRODUCTS, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF ALL PRODUCTS OF 1899.

GROSS VALUE OF ALL PRODUCTS OF 1899.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (value of all products of 1899).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The Territory	$24,850	$1,560	$5,053	$1,130	$9,097	29.8
$0	83,315	3,813	12,570	1,253		
$1 to $49	1,219	109	6	28	31	2.3
$50 to $99	639	190	12	70	71	7.8
$100 to $249	749	170	12	83	169	16.7
$250 to $499	955	109	15	105	343	27.6
$500 to $999	1,581	270	42	228	668	31.5
$1,000 to $2,499	4,333	471	120	839	1,476	25.6
$2,500 and over	169,012	9,936	36,986	7,064	72,386	32.5

There are 52 farms, ranging in area from 3 to 1,000 acres and over, which reported no income for 1899. There was expended for labor on these 52 farms in 1899, $422,270, an average per farm of $8,121. These figures indicate that the farms reporting no income in 1899 are, for the most part, of recent development. Among the number are two new sugar plantations, representing an area of many thousands of acres, on one of which $328,819 was expended for labor alone. These facts account for the very high average acreages and values of the farms classed in Tables 13 and 14 as nonproducers. A few of the farms in this group, however, had been partially abandoned in 1899, while others had changed owners or tenants, and the persons in charge, June 1, 1900, were unable to give definite information concerning the products of the preceding year. To this extent the reports fall short of giving a complete exhibit of farm income in 1899.

LIVE STOCK.

The classification of live stock used in connection with the enumeration in Hawaii was that adopted by the Twelfth Census at the request of the various live-stock associations of the country. The age grouping of neat cattle was determined by their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex.

Table 15 presents a summary of live-stock statistics.

TABLE 15.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES.

LIVE STOCK.	Age in years.	ON FARMS.[1]		
		Number.	Value.	Average value.
Calves	Under 1	17,517	$85,654	$4.89
Steers	1 and under 2	15,075	140,301	9.31
Steers	2 and under 3	10,319	122,083	11.83
Steers	3 and over	12,640	223,391	17.67
Bulls	1 and over	830	29,889	36.01
Heifers	1 and under 2	9,433	98,621	10.45
Cows kept for milk	2 and over	4,028	127,820	31.73
Cows and heifers not kept for milk	2 and over	32,948	457,767	13.89
Colts	Under 1	379	3,238	8.54
Horses	1 and under 2	1,522	36,489	23.97
Horses	2 and over	11,081	401,934	36.27
Mule colts	Under 1	69	1,387	20.10
Mules	1 and under 2	424	19,775	46.64
Mules	2 and over	6,013	569,345	94.69
Asses and burros	All ages	1,438	13,355	9.29
Lambs	Under 1	17,492	11,500	0.66
Sheep (ewes)	1 and over	61,646	87,412	1.42
Sheep (rams and wethers)	1 and over	22,960	34,971	1.52
Swine	All ages	8,057	49,576	6.15
Goats	All ages	653	731	1.12
Chinese buffaloes	All ages	80	7,000	87.50
Working bullocks	All ages	38	1,240	32.63
Fowls:[2]				
Chickens[3]		31,888	38,237	
Turkeys		4,672		
Geese		75		
Ducks		21,508		
Bees (swarms of)		1,387	8,426	6.07
Value of all live stock			2,570,142	

[1] No enumeration was taken of live stock not on farms or ranges in Hawaii.
[2] The number reported is of all fowls over 3 months old. The value is of all, old and young.
[3] Including Guinea fowls.

The neat cattle of the territory are generally of an inferior grade. The comparatively high average value of dairy cows, $31.73, is the result of the great demand for dairy produce, which has led the farmers to keep a better grade of cows than of other neat cattle.

Cattle raising is confined chiefly to the mountainous districts, where natural pasturage is abundant. Moreover, the horn fly has proven such a serious pest on the lands of lower altitude that the keeping of herds there is considered practically impossible.

The recent great development of the sugar industry has diminished the acreage used for grazing and has tended to check the increase in the number of neat cattle. This has not, however, proved injurious to the cattle-raising industry. Formerly the local consumption of beef was much less than the supply, many animals being slaughtered for their hides and tallow. Now, through the reduction of supply caused by the conversion of many acres of pasture land into cane fields, and the increased demand due to the rapid growth of population, not enough cattle are raised to supply the demand of local consumers, and all the animals raised find a ready market in the territory at high prices, despite the fact that they are of an inferior quality.

Only 25 farmers reported sheep on hand, June 1, 1900.

The number of these animals, however, was 84,606, showing an average of 3,384 for each farmer engaged in the sheep-raising industry. The island Niihau is almost wholly utilized in connection with sheep ranches, and some very good stock is kept, although the native sheep, as a rule, are inferior in quality.

The total number of horses exceeds that of mules, although on the larger plantations, especially those producing sugar, mules are being employed to an increasing extent as they are better adapted to the warm climate of the islands.

The prevailing conditions in Hawaii are not well suited to the raising of swine, although there is a good market for pork among the Chinese residents. Only 8,057 swine were reported.

The Chinese water buffalo is particularly well adapted to the work of cultivating the marshy rice fields, and nearly one hundred of these animals had been imported from China for that purpose prior to June 1, 1900. With the extension of the rice industry a much larger number will doubtless be employed.

ANIMAL PRODUCTS.

Table 16 presents a summarized exhibit of the animal products of agriculture.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS, IN 1899.

PRODUCTS.	Unit of measure.	Quantity.	Value.
Wool	Pounds	424,228	$53,686
Milk	Gallons	[1]584,120	
Butter	Pounds	118,871	91,876
Cheese	Pounds	12	
Eggs	Dozens	155,710	45,257
Poultry			61,546
Honey	Pounds	96,870	8,293
Wax	Pounds	1,720	
Animals sold			298,476
Animals slaughtered			64,081
Total			623,215

[1] Includes all milk produced.

The value of animal products in 1899 was $623,215, or but 2.8 per cent of the value of all farm products. Of the above amount, 58.2 per cent represents the value of animals sold and slaughtered on farms; 17.1 per cent, that of poultry and eggs; 14.8 per cent, that of dairy products; 8.6 per cent, that of wool; and 1.3 per cent, that of honey and wax.

POULTRY AND EGGS.

The total receipts from products of the poultry industry in 1899 were $106,803, of which amount 57.6 per cent represents the value of fowls raised during the year, and 42.4 per cent the value of the eggs produced.

DAIRY PRODUCE.

Although dairy produce finds a ready market at very high prices, dairying is carried on to a limited extent only. During the year 1899, the production of butter was but 0.8 of a pound per inhabitant, and that of milk was but 3.8 gallons.

Of the $91,876 given in Table 16 as the value of all dairy products in 1899, $31,522, or 34.3 per cent, represents the value of milk, butter, and cheese consumed on farms, and $60,354, or 65.7 per cent, the amount realized from sales of such products. Of the latter sum, $24,899 was derived from the sale of 84,451 gallons of milk, and $35,455 from the sale of 96,209 pounds of butter. Of the total production of milk, 584,120 gallons, approximately 416,100 gallons were employed in the making of butter, 84,451 gallons were sold as milk, and the remainder, about 83,569 gallons, was consumed upon the 320 farms on which it was produced.

WOOL.

The raising of sheep is confined almost wholly to the islands of Hawaii, Lanai, Niihau, and Molokai, which reported 97.4 per cent of the total number of sheep on the islands, June 1, 1900, and 98.1 per cent of the total production of wool for the year 1899. Hawaii leads the other islands with an output of 187,925 pounds of wool, or 44.3 per cent of the total clip. The average weight per fleece, 4.53 pounds, and the low average value per pound, 12.7 cents, seem to indicate that the product is of an inferior grade.

HONEY AND WAX.

The island of Oahu reported 80.3 per cent of the total production of honey, and 50.0 per cent of the production of wax. Despite the fact that there were but 1,387 stands of bees reported, with a product aggregating only $8,293 in value, the islanders exported most of their honey to the other islands of the Pacific and to the United States.

CROPS.

The acreages, quantities, and values of the crops of the territory in 1899, are given in the following table.

TABLE 17.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL CROPS IN 1899.

CROPS.	Acres.	Unit of measure.	Quantity.	Value.
Sugar cane	65,687	Tons	2,239,376	
a Cane sold		Tons	172,544	$729,481
b Sugar made		Tons	252,283	18,025,515
c Molasses made		Gallons	285,661	8,000
Rice	9,130	Pounds	33,442,400	1,502,051
Coffee	[1]6,451	Pounds	2,297,000	246,181
Corn	3,238	Bushels	115,909	65,938
Sorghum and grasses cut green	19	Tons	271	803
Taro	1,279	Bags[2]	[3]169,323	177,843
Tobacco	23	Pounds	50,410	5,101
Dry beans	26	Bushels	354	626
Dry pease	1	Bushels	56	100
Potatoes	166	Bushels	9,242	6,133
Sweet potatoes	135	Bushels	9,284	6,360
Onions	2	Bushels	140	202
Miscellaneous vegetables[4]	[1]124			45,727
Bananas	[1]356	Bunches	141,653	52,620
Pineapples	[1]79	Number	116,560	9,160
Oranges	[1]81	Boxes	8,368	6,714
Limes	[1]6	Boxes	1,536	3,030
Alligator pears	[1]8	Pounds	53,370	1,338
Other tropical fruits[5]	[1]39	Pounds	44,310	2,982
Grapes	[1]5	Pounds	29,310	703
Small fruits	[1]10	Quarts	10,420	1,120
Orchard fruits	[1]33	Bushels	1,046	879
Peanuts	4	Bushels	848	715
Cocoanuts	[1]2	Number	8,350	250
Forest products				125,094
Miscellaneous				332,870
Total	86,854			21,417,516

[1] Estimated from number of trees, plants, and vines.
[2] Average weight of bag of taro, 100 pounds.
[3] Including 70 bags lin gau (Chinese taro) and 26 bags imo (Japanese taro).
[4] Including cabbages, muskmelons, radishes, turnips, watermelons, etc.
[5] Including figs, guava strawberries, lemons, loquats, mangoes, tamarinds, etc.

Of the 86,854 acres of cultivated land, 65,687, or 75.6 per cent, were used for growing sugar cane; 9,130, or 10.5 per cent, for rice; 6,451, or 7.4 per cent, for coffee; 3,238, or 3.7 per cent, for corn; 1,279, or 1.5 per cent, for taro; and 1,069, or 1.3 per cent, for all other crops, including fruit and vegetables.

SUGAR.

The value of all cane sold and of all sugar and molasses *made on plantations* from cane grown thereon was $18,762,996, or 87.6 per cent of the total value of all crops reported. This percentage reflects the relative importance of the sugar industry in the agriculture of Hawaii, and represents approximately the relative number of persons employed in that industry as compared with the total number engaged in agriculture.

NUMBER AND CHARACTER OF THE FARMS RAISING SUGAR CANE.

Table 18 gives the number of farms and total acreage devoted to the growing of sugar cane, with total yield in tons.

TABLE 18.—NUMBER OF FARMS, TOTAL ACREAGE, AND AMOUNT OF SUGAR CANE PRODUCED IN 1899, BY ISLANDS.

ISLANDS.	Number of farms growing cane.	Total number of acres planted to cane.	Total production of cane in tons.
The Territory	184	65,687	2,239,376
Hawaii	152	35,096	983,053
Kauai	13	12,947	487,198
Maui	10	10,531	393,383
Oahu	8	6,910	365,742
Lanai	1	200	[1] 4,000

[1] Estimated. Crop not matured December 31, 1899.

Although the acreage devoted to sugar cane constitutes three-fourths of the total area of cultivated land and contributes over four-fifths of the value of all crops, the number of farms whose operators are engaged in growing cane is only 184, or but 8.1 per cent of the farms in the territory. Of these 184 farms or plantations, the operators of 170 made the growing of cane, either with or without the reduction of the same to sugar, the principal source of their farm income, while 14 cultivated small tracts incidental to their other farming operations and sold the product. Sugar and molasses were manufactured by the operators of 42 plantations, 30 of whom used only the cane grown on their own lands, while 12 purchased a part of the cane; 4 large plantations, on which extensive plants for making sugar had been erected or were in the process of erection, had been in operation so short a time that no cane had been sold nor sugar manufactured prior to June 1, 1900; on the remaining 124 plantations the crop was sold as cane. There were 2 sugar establishments which were unconnected with plantations and therefore purchased all the cane used.

The 138 planters, who grew cane and sold the same to other planters or to the independent sugar houses, reported the sale in 1899 of 172,544 tons of cane, an average of 1,250 tons per farm, while the operators of the 40 other plantations cut a total of 2,066,832 tons, or an average of 44,931 tons per farm.

VALUE AND INCOME OF SUGAR PLANTATIONS.

The 170 farms or plantations, whose operators made the sugar industry their principal source of income, constituted only 7.5 per cent of all the farms in the territory, but contained 1,043,117 acres of land, or 40.0 per cent of all farm land. Their lands and improvements, aside from buildings, had a value of $48,543,391, and their buildings were valued at $2,737,685. The aggregate value of their implements and machinery, including steam plows, locomotives, railroads and cars for hauling cane, engines and pumps for irrigation, machinery for grinding cane and making sugar, and other similar apparatus, was $11,319,020, and the total value of their live stock, $1,108,533, making the total fixed agricultural capital invested in these 170 plantations, $63,708,629, or 86.0 per cent of all agricultural capital in the territory. The gross value of the products of these plantations, including sugar made on *plantations from* cane grown thereon, but exclusive of sugar made from cane purchased by one planter from another, was $19,262,031, an amount equal to 30.2 per cent of their fixed capital. The expenditure for labor, including all salaries and wages, was $6,971,896, and that for fertilizers was $1,326,407. These two items of expense, which were the only ones obtained from *sugar farms*, equalled 43.1 per cent of the gross income of such farms.

VALUE AND INCOME OF 46 LARGE PLANTATIONS.

For the 46 plantations with facilities for manufacturing sugar, additional reports were secured which throw much light upon the industry. These plantations controlled 894,289 acres of land, worth, with buildings and improvements, $51,250,210; implements and machinery worth $11,019,872; and live stock valued at $953,376, making a total fixed capital of $63,223,458. In connection with the agricultural operations outside of sugarhouses, they expended in 1899, for labor, including salaries, $4,743,256; for fertilizers, $1,209,130; for fuel used in running the irrigation pumps, steam plows, and locomotives, and in carrying on kindred field operations, $681,186; for feed purchased, $486,808; and for the maintenance and repair of irrigation works, $827,932. The total, $7,948,312, includes all the reported expenditures outside of the sugarhouses. Unreported expenses are the rentals paid for the 457,492 acres of land leased from the government, and the 142,449 acres leased from private persons or corporations; the expenditures for maintaining and repairing machinery, appliances, and buildings in use, outside of the sugarhouses, and the taxes on land owned. These expenses, together with the $7,948,312 given above, are probably sufficient to nearly, if not quite, equal the amount, $9,580,495, which the sugarhouses returned on the manufactures' schedules as the cost of the 2,226,307 tons of cane which they converted into sugar. The average cost of raising a ton of cane and delivering it to the factory may, therefore, be said to have been $4.30.

The expenditures connected with the operation of the sugarhouses on these 46 plantations, as distinct from their other agricultural operations, are tabulated with those of the 2 establishments making sugar but not growing cane. These 2 establishments are so small, comparatively, that their inclusion does not materially affect the totals. In 1899 the expenditure of the 48 sugarhouses for labor, including salaries, was $1,111,776; for fuel, $57,524; for mill supplies, $181,620; for freight charges, $58,283; for taxes and insurance on sugarhouses and contents, $79,455; for interest, repairs, and miscellaneous expenses connected with the operation of the sugarhouses, $541,278; for cane purchased from outside plantations, $671,445; and for all other material, $551,854.

The total expense of operating sugarhouses, exclusive of the amount paid for cane purchased, was $2,581,790, or an average of $1.16 for each ton of cane converted into sugar. This makes the total cost of raising a ton of cane and converting it into sugar, $5.46, of which amount the cost of the sugarhouse operations represents a little less than one-fourth. On the other hand, the fixed capital connected with the sugarhouses is $8,654,476, which represents a little less than one-seventh of the total amount invested in the industry. The average value of the sugar produced from a ton of cane was $8.60, leaving a margin of $3.14 per ton of cane to cover interest on investment, and renewals of buildings, implements, machinery, etc. After making liberal allowances for these items the figures show a net profit that is realized in but few industries.

The value of the 46 sugarhouses, which are located on plantations, together with that of their products, is included in the statistics of the agricultural wealth of Hawaii as reported by this division of the Census Office. Their operations are incidental to the growing of cane on the plantation and their output is included with the total farm products. Since these houses are engaged in the manufacture of raw sugar, their capital and output are also included in the report of the division of manufactures. To this extent the statistics collected by the two divisions involves a duplication, which will be taken into account in the final reports of the Twelfth Census.

PLANT AND RATTOON CANE.

In 1899 the 46 plantations, equipped with machinery for making sugar, cultivated 60,168 acres of cane, or 91.6 per cent of the total acreage, of which 35,282 acres were plant-cane, 24,746 acres first-year rattoon, and 140 acres second-year rattoon. Only a very limited quantity of second-year rattoon cane is grown, the planters finding it more profitable, as a rule, to re-seed their land after two crops.

From these 60,168 acres 2,036,832 tons of cane were harvested, of which 1,389,152 tons were plant-cane; 675,595 tons, first-year rattoon; and 2,085 tons, second-year rattoon. No cane was reported as kept for seed, as the planters of Hawaii use the tops for this purpose, and thus avoid the large expense for seed necessary in the southern part of the United States.

The average quantity of cane cut for sugar making from each acre harvested was 34.4 tons, ranging from 28.0 tons in Hawaii to 53.0 tons in Oahu. In the former island cane is grown without irrigation, while in the latter the fields are irrigated, hence the great difference in average yield.

SUGAR AND MOLASSES PRODUCED.

The 46 plantations which grew cane and made sugar in 1899, together with the two independent sugarhouses, reported the purchase of 159,475 tons of cane, for which they paid $671,445. The 138 farmers from whom this cane was purchased reported the sale of 172,544 tons, for which they received $729,481. The variations in the two sets of reports, amounting to 13,069 tons of cane, with a value of $58,036, are due to the following facts: The business year of some of the planters who purchased cane does not coincide with the calendar year, which is commonly used by the small planters in making their reports; in addition, the reported quantity and value of cane sold includes estimates of the cane harvested on certain newly established plantations whose crops were not fully matured on December 31, 1899.

The total sugar output of the Hawaiian Islands in 1899 was 271,049 tons, or 542,098,500 pounds, consisting of 466,254,500 pounds of what is known to the trade as "firsts," 75,310,000 pounds of "seconds," and 534,000 pounds of "thirds." The total value of the product was $19,254,773. This was the greatest crop in the history of the islands. From data secured by the representatives of the Twelfth Census the product of 1898 is estimated to have been 225,548 tons, or 45,501 tons less than the crop of 1899.

The total quantity of molasses reported as having been produced in the sugar mills of the islands in 1899 was 4,987,661 gallons, of which but 285,661 gallons, valued at $8,000, was disposed of by sale. The remainder was either used as fertilizer or fed to stock.

As a result of the progress made in the sugar industry during the past quarter of a century, Hawaii now ranks third among the sugar-producing countries of the world. Java and Cuba each produce more sugar than does Hawaii, but on neither of these islands does the average yield per acre equal that in Hawaii, where yields of from 60 to 70 tons of plant cane per acre, and of 30 to 50 tons of rattoon cane, are common. The percentage of saccharine content in Hawaiian cane is also very high, an average of but 8.21 tons of cane having been required in 1899 for the production of 1 ton of sugar. The average production of sugar from an acre of cane was 4.13 tons, but in many localities yields of 8, 10, and even 14 tons per acre are reported.

The methods employed in cane cultivation are more advanced in Hawaii than in any other of the world's sugar-producing centers. Steam and gang plows are in general use, and on plantations where the rainfall is insufficient costly pumping plants have been erected. One of these pumping stations on the island of Oahu represents an outlay of $1,750,000. The most modern systems have like-

wise been introduced for the reduction of cane, and very recently some of the mills have installed crushing apparatus and other machinery of the most improved type, in order to secure a slightly increased degree of extraction over that possible with the equipment formerly used. Cane is generally taken from the fields to the mills by means of private railroads or a system of flumes. In Hawaii, the refuse cane, or bagasse, furnishes sufficient fuel to operate the sugar mills. The importance of this item as a factor in the success of the industry becomes evident, when it is known that in Louisiana, where considerably less sugar was produced, fuel to the value of $644,655 was burned in 1899 in addition to the bagasse used. This advantage, combined with the superior climatic and soil conditions, make the sugar-raising areas of Hawaii the most remunerative in the world.

CEREALS AND MISCELLANEOUS CROPS.

The cultivation of rice is carried on most extensively on the island of Oahu, where 20,998,600 pounds, or 62.8 per cent of the total crop of 1899, were grown. The island of Kauai produced 90.8 per cent of the remainder of the crop. The average yield per acre in 1899 was 3,662.9 pounds, and the average values, 4.7 cents per pound and $171.09 per acre. On the island of Oahu the average yield per acre was 4,087.7 pounds, while individual yields ran considerably above that figure. These high average yields result from the fact that the uniformly warm climate of the territory permits two crops to be grown on the same land in a twelvemonth. The industry is almost wholly in the hands of the Chinese, who, for the most part, use the crudest of implements and employ the most laborious methods. Although a considerable quantity is exported, the major portion is consumed on the islands, being in great demand in the populous Chinese districts.

The only other cereal raised to any extent is corn. The acreage devoted to this crop in 1899 was 15.3 per cent of the total cultivated area exclusive of that planted in sugar cane. The average yield per acre was 35.8 bushels, and the average values, 56.9 cents per bushel and $20.36 per acre. Attempts to introduce other grains have met with slight success.

Tobacco is the most important of the minor crops grown in the territory. The 23 acres devoted to this crop in 1899 produced 50,410 pounds, or an average yield per acre of 2,191.7 pounds. The total value of the crop, which brought an average price of 10.1 cents per pound, was $5,101, or an average return per acre of $221.78. Almost the entire crop is grown on the island of Hawaii, and consists of a coarse, dark, excessively strong variety, although attempts at growing improved grades indicate that the industry might be greatly developed.

Systematic methods for the cultivation of forage crops have not been generally adopted among stock raisers. In a few cases alfalfa, sorghum, etc., are grown for forage purposes, but only to a very limited extent, as is shown in the report of "sorghum and grasses" in Table 17. Many rich grasses grow readily on the islands, but owing to the frequent rains the crop is generally spoiled in the curing process.

COFFEE.

The production of coffee in 1899 was the largest in the history of the islands. From 6,451 acres of land, on which were 3,225,743 bearing trees, a product of 2,297,000 pounds was secured. The number of trees here given includes a great many young trees which had just come into bearing and yielded only a small crop. Consequently the average yield per tree for the census year, 0.7 of a pound, represents little more than half the producing capacity of fully matured trees. The average production per acre was 356.1 pounds, while the average values were 10.7 cents per pound and $38.16 per acre. Of the total production, 2,112,650 pounds were grown on the island of Hawaii; 69,800 pounds on Maui; 68,100 pounds on Oahu; 42,750 pounds on Kauai; and 3,700 pounds on Molokai.

VEGETABLES.

Although some districts of the islands are adapted to the cultivation of almost every known vegetable, very little is done in the way of diversified truck farming. The Chinese at present control the local production of vegetables, which is not sufficient for the local demands, the rest of the necessary supply being obtained by importations, mainly from California. The production of taro, the great native food, is extensively carried on. In the islands of Hawaii, Kauai, Maui, Molokai, and Oahu, there were in 1899, 559 farmers engaged in the cultivation of this tuber. In the production of the 169,323 bags which constituted the output for that year, they made use of 1,279 acres of land. Oahu leads in production, and it is there also that the consumption of the raw and manufactured product is greatest. The average yield per acre in 1899 was 132.5 bags, and the average price, $1.05 per bag. The value of the crop constituted 75.3 per cent of the value of all vegetables.

Second in importance, among the vegetables, are sweet potatoes and Irish potatoes. Of the former there were grown in 1899, 9,284 bushels, valued at 69 cents per bushel, and of the latter 9,242 bushels, valued at 66 cents per bushel. The average yield and average value per acre of all potatoes were 61.5 bushels and $41.50, respectively.

FRUIT.

Although the growing of many of the tropical and subtropical fruits, to which the soil and climate of Hawaii are adapted, has not as yet been carried beyond the experimental stage, considerable progress in the cultivation of some of these fruits has been made in recent years. The banana, pineapple, and orange have become of commercial importance, although the total value of the three products in 1899 was but $68,494. While 205 of the 351 banana growers of the territory are located on the island of Hawaii, Oahu practically monopolizes the industry, having produced in 1899, 81.2 per cent of the entire output. Hawaii ranks second; Kauai, third; Maui, fourth; and Molokai, fifth. The average value in 1899 was 37.1 cents

per bunch, but the best grades bring much higher prices in the retail market.

Oahu leads also in the production of pineapples, 84,310, or 72.3 per cent of the total number reported, having been grown in close proximity to Honolulu. The average yield per acre was 1,475.4, and the average value 7.9 cents each.

Although the raising of oranges has proven successful very little has been done toward advancing this particular branch of agriculture. The crop of 1899 was 3,368 boxes, of which 2,863 boxes, or 85.0 per cent, were grown on the island of Hawaii. The growing of oranges should, in time, develop into a highly remunerative industry, as the average return per acre from the crop of 1899 was $216.58.

The total area used in growing small fruits was but 10 acres, and the value of the fruit produced, $1,120. The crop of 1899 consisted entirely of strawberries, 97.1 per cent being produced on the island of Oahu.

Of the other fruits grown on the islands, limes, alligator pears, peaches, lemons, loquats, guavas, and mangoes yield the greatest returns. Table 19, which contains a classified list of nonbearing trees, gives an idea of the progress being made in the cultivation of each of these fruits.

NONBEARING TREES, VINES, AND PLANTS.

The following table gives a classified list of the nonbearing fruit trees and plants of Hawaii by islands.

TABLE 19.—NUMBER OF NONBEARING TREES, VINES, AND PLANTS IN 1899.

ISLANDS.	Total.	Coffee.	Banana.[1]	Orange.	Lime.	Lemon.	Pineapple.[1]	Alligator pear.	Fig.	Peach.	Mango.	Cocoanut.	Miscellaneous.[2]
The Territory	1,653,077	1,444,634	55,131	4,575	6,678	700	130,074	3,198	1,099	2,988	426	585	3,039
Hawaii	1,347,367	1,288,858	33,002	2,910	2,436	667	9,814	2,688	898	2,821	224	255	2,794
Kauai	53,684	47,981	3,771	944	112	11	640	130	19	50	2	18	6
Maui	101,161	58,200	4,790	13	71	7	38,000	15	11	40	----------	14	----------
Molokai	1,250	1,200	50	----------	----------	----------	----------	----------	----------	----------	----------	----------	----------
Oahu	149,615	48,395	13,518	708	4,059	15	81,620	365	171	77	200	248	239

[1] Bananas and pineapples generally come into fruiting within a year; those reported here are the plants on new plantations which had not matured during the year 1899.

[2] Including apples, breadfruit, citron, guava strawberries, litchi nut, loquat, papaie, pears, pomeloes, olives, rose apples, tamarinds, and grape vines.

The figures shown in the above tabulation represent, for the most part, the number of newly planted trees, rather than mature trees which were barren in 1899. They are, therefore, of importance as an index of the recent growth of the fruit-raising industry.

Of the 1,653,077 nonbearing trees on the islands in 1899, 1,444,634, or 87.4 per cent, were coffee trees which had not reached maturity at the close of the census year. Of this latter number 89.2 per cent were on the island of Hawaii, which reports also 87.7 per cent of the bearing coffee trees. A product of 2,297,000 pounds of coffee was secured in 1899 from 3,225,743 trees. If the trees which were not yet in bearing in 1899 prove equally productive, the coffee crop will be increased 44.8 per cent in the near future. Coffee is best grown at an altitude just above that at which sugar cane can be raised most remuneratively, and on a few plantations the cultivation of both these crops is carried on simultaneously with great success.

Second in importance among nonbearing trees and plants are pineapples. The total number, 130,074, exceeds by 10,555 the number of plants in bearing in 1899, indicating the rapid growth which this industry is experiencing.

For the other fruits the ratios between the numbers of nonbearing and bearing trees are as follows: The number of nonbearing banana plants is equal to 35.3 per cent of the number of bearing plants; oranges, 209.1 per cent; limes, 280.1 per cent; lemons, 489.5 per cent; alligator pears, 570.1 per cent; figs, 136.5 per cent; peaches, 105.6 per cent; cocoanuts, 209.8 per cent.

FOREST PRODUCTS.

The term "forest products" as employed here includes all of the cord wood, logs, railroad ties, fence posts, bark, resin, and similar materials cut or produced on farms. The value of such products in 1899 was $125,094, reported by 172 farmers, most of whom were on the islands of Hawaii, Kauai, Maui, and Oahu. The wooded sections of the islands contain many valuable hard woods and large timber, suitable for bridge construction and shipbuilding. Considerable wood is cut for fuel.

Attention is being directed to the reforesting of the islands, and in the vicinity of Honolulu much progress has already been made. The islanders are, furthermore, taking steps to protect the woodlands from the ravages of roaming cattle.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899 was $7,913,166, an average of $3,481 per farm. The average was highest on the sugar plantations, where $6,971,896, or 88.1 per cent of the total amount was expended. The average expenditures per farm for the several classes of farms were as follows: Sugar plantations, $41,011; live-stock farms, $1,042; rice farms, $951; coffee plantations, $360; dairy farms, $206; fruit farms, $148; vegetable farms, $96; taro farms, $51; tobacco farms, $46; and miscellaneous farms, $101. "Managers" expended on an average, $57,442; "part owners," $489; "share tenants," $384; "cash tenants," $282; and "owners," $166. White farmers expended $14,312 per farm; Chinese farmers, $682; part Hawaiian farmers, $327; Japanese farmers, $113; and Hawaiian farmers, $102.

Relative expenditure is made a little clearer by reducing the averages to the basis of the acre. If that is done tobacco farms are found to lead with an expenditure per acre for labor, of $30.66. Rice farms show an expenditure of

$28.81 per acre; fruit farms, $12.13; sugar farms, $6.70; vegetable farms, $4.53; coffee farms, $2.63; dairy farms, $1.76; miscellaneous, $1.54; taro, $1.19; while live-stock farms show by far the lowest expenditure per acre, $0.14.

Of the operators of farms classified by tenure, share tenants expended the largest amount per acre, $15.87, cash tenants following with $9.49. Managers expended $3.42; owners, $0.46; and part owners, $0.38.

Of operators classified by race, Chinese farmers expended $21.45 for labor per acre; white farmers, $3.49; Japanese, $3.65; part Hawaiian, $0.19; and Hawaiian, $0.11.

On June 1, 1900, the operators of the 46 leading sugar plantations had in their employ 34,294 persons, of whom 34,016 were adult males and 278 were women and children. The nationalities of the former were reported in detail as follows: Japanese, 24,112; Chinese, 5,704; white, 3,055; Hawaiian, 988; part Hawaiian, 109; negro, 6; and other races, 42. Of the whites, 1,753 were Portuguese; 785, natives of European countries other than Portugal; and 517, natives of America.

The labor problem is one of the most serious connected with the sugar industry in Hawaii. Until recently the great majority of the laborers employed upon the plantations have been Japanese or Chinese. Since the act of Congress of July 7, 1898, authorizing the annexation of Hawaii as a territorial part of the United States, became operative, thus bringing the Chinese Exclusion Act into force, there has been practically no immigration of unskilled labor. The cessation of labor importation, resulting from the enforcement of this statute, together with the fact that many of the alien laborers have returned to their native lands, has caused a reduction in the relative number of plantation workers, even though wages are continually being advanced.

Fertilizers purchased in 1899 cost $1,352,847, an average of $595 per farm. As with labor, the bulk of the expenditure for fertilizers was made on the sugar plantations, the average per farm being $7,802. For rice farms the average was $33; for coffee plantations, $11; for taro farms, $5; for fruit farms, $4; for vegetable farms, $3; for live-stock farms, $1; and for miscellaneous farms, $6.

IRRIGATION STATISTICS.

The topographical features of the territory, which are described elsewhere, have a marked influence upon the development of agriculture. The islands are all of volcanic origin, and their rocks consist almost exclusively of dark, basaltic lava, more or less porous in structure. The islands are built up of a great number of lava-flows, which, as they were not continuous or regular, over large areas are of varying thickness, and cause the marked irregularity of profiles presented everywhere. Where the slopes are less steep and the lava has disintegrated, the aspect is much softened by the growth of grass and timber. Elsewhere the mountain sides are deeply scored with canyons, crevasses, and fissures. The large cultivated areas are located on the lower levels, generally between the bases of the mountains and the sea.

The annual rainfall ranges from 42 inches on the island of Oahu, to 120 inches on Hawaii, but extreme variations are frequently recorded within comparatively narrow limits. On the island of Oahu, which contains only 600 square miles, the annual rainfall often varies from 19 inches at Honolulu to 108 inches in Nuuanu Valley, and on the leeward and windward sides of Hawaii the difference is even greater. This great range of precipitation within small areas is due to the fact that the prevailing winds are the moisture laden northeast trade winds. On striking the high altitudes of the islands these winds are deflected and occasion heavy rainfalls and lower temperatures on the windward or eastern sides. The precipitation is greatest on the higher slopes and decreases towards the sea level, instances being reported where the rainfall on one part of a plantation is ample, while on the same plantation, at a lower altitude, it was quite insufficient for the production of any crop.

Irrigation is an exceedingly important factor in the agriculture of all the islands except Hawaii, and although its practice on an extensive scale dates back only to the time when the white planter began to dominate agriculture, it has already transformed the islands. Where irrigation has been introduced on the windward sides the water supply has been taken from streams by means of gravity canals and ditches; and reservoirs, many of them of large capacity, have been constructed to conserve the waters during the rainy season. The most important irrigation systems, however, are located on the leeward sides, where the water supply is obtained from artesian wells.

Owing to the peculiar topography of the islands, the exceeding porosity of the soil, and the absence of large streams, irrigation, for the most part, is very expensive. It necessitates the boring of many artesian wells, the construction of large and powerful pumping plants, and of costly flumes and ditches. In addition, the salaries of the skilled engineers and other employees in charge of the water supply, contribute to swell the cost of irrigation far beyond that entailed upon the farmers of the arid West. Notwithstanding these obstacles, the extension of irrigation has been along the most improved and scientific lines, and the rewards which have followed have been most gratifying.

The Hawaiian sugar plantations are the most productive in the world, and their irrigation plants are among the most modern and expensive constructed by private capital. Some conception of the difficulties which the planters have surmounted may be obtained from a brief description of one of the great engineering feats recently accomplished on the island of Maui. A canal was dug along the slopes of the great crater Haleakala, and a large stream of water was brought a distance of 22 miles, and distributed through laterals over the plantation. Along

the route of the canal, scores of gulches and canyons are crossed and a dozen or more high ridges are penetrated by tunnels, some of them nearly half a mile in length. One of the gulches, situated on the side of a vast crater, is 350 feet deep and nearly a quarter of a mile wide, with perpendicular sides. The pipe lines used in crossing it were not placed on trestles, but the less expensive and more stable method was followed of dropping them into the gulch, thus forming an inverted siphon which proved a success from the start.

The following tables present the principal statistics of irrigation.

TABLE 20.—NUMBER OF IRRIGATED FARMS, COMPARED WITH TOTAL NUMBER OF FARMS, AND IRRIGATED ACREAGE COMPARED WITH TOTAL IMPROVED ACREAGE, JUNE 1, 1900.

ISLANDS.	NUMBER OF FARMS.			NUMBER OF CULTIVATED ACRES IN FARMS.		
	Total.	Irrigated.	Per cent irrigated.	Total.	Irrigated.	Per cent irrigated.
The Territory	2,273	957	42.1	86,878	38,994	44.9
Hawaii	354	36	3.8	42,363	1,205	2.8
Kauai	396	342	85.7	16,893	16,798	99.4
Lanai	2	1	50.0	200	200	100.0
Maui	389	142	37.1	14,190	8,976	63.3
Molokai	27	13	48.1	126	46	36.5
Niihau	1					
Oahu	507	423	83.4	13,106	11,759	89.8

TABLE 21.—ACREAGE AND LAND VALUES OF IRRIGATED FARMS COMPARED WITH ACREAGE AND LAND VALUES OF ALL FARMS, BY ISLANDS.

ISLANDS.	TOTAL AREA.			LAND VALUES.		
	All farms.	Irrigated farms.	Per cent irrigated.	All farms.	Irrigated farms.	Per cent irrigated.
The Territory	2,609,613	724,600	27.8	$56,484,064	$35,279,210	62.5
Hawaii	1,747,213	338,284	19.4	16,495,470	2,319,880	13.5
Kauai	286,275	176,215	74.6	11,552,710	11,399,210	98.7
Lanai	94,960	4,960	5.2	692,500	195,000	28.2
Maui	240,016	108,178	45.1	14,468,700	10,505,400	72.6
Molokai	107,873	5,521	5.1	341,730	39,350	11.5
Niihau	40,000			45,000		
Oahu	123,276	91,501	74.2	12,887,901	10,920,210	84.7

The average size of all farms is 1,148 acres and of irrigated farms, 757 acres. The average area of cultivated land actually irrigated, however, is but 41 acres, or 5.4 per cent of the average area of farms on which irrigation is used. Exclusive of buildings, the land of unirrigated farms has an average value of $11.25, while for irrigated farms the average is $48.69 per acre.

Table 22 is a comparative exhibit by islands of the total acreages and the acreages irrigated for each of the principal crops.

TABLE 22.—ACREAGE AND VALUE OF PRINCIPAL IRRIGATED CROPS: 1899.

CROPS.	ACREAGE.			VALUE OF CROPS.	
	Total.	Irrigated.	Per cent irrigated.	Total.	Irrigated.
Sugar cane	65,657	28,488	43.4	[1]$18,762,996	[1]$10,940,061
Rice	9,130	9,130	100.0	1,562,051	1,562,051
Coffee	6,451	64	1.0	246,181	4,905
Corn	8,238	1	(2)	55,938	9
Sorghum and grasses cut green	19			803	
Taro	1,279	910	71.2	177,813	146,681
Tobacco	23			6,101	
Dry beans	26			626	
Dry peas	1	1	100.0	100	100
Potatoes	186	5	3.0	6,133	842
Sweet potatoes	135	34	25.2	6,360	1,782
Onions	2	(3)	(2)	202	2
Miscellaneous vegetables	224	99	45.4	445,727	[4]31,228
Bananas	356	220	63.5	52,620	48,245
Pineapples	70	47	59.5	9,160	6,198
Oranges	31			6,714	
Limes	6	5	83.3	3,050	2,600
Alligator pears	8	2	25.0	1,398	800
Cocoanuts	2			250	
Other tropical fruits	39	5	12.8	2,982	700
Small fruits	10	10	100.0	1,120	1,099
Grapes	5			703	
Orchard fruits	33			870	
Peanuts	4			715	
Total	86,854	38,997	44.9	20,959,552	[5]12,751,099

[1] Includes cane sold and sugar and molasses made.
[2] Less than one-tenth of 1 per cent.
[3] Less than 1 acre.
[4] Includes $24,365 produced on duplicate acreage.
[5] Includes $18,755 produced on duplicate acreage.

In addition to the values given above, there were $125,094 worth of forest products, and $332,870 worth of miscellaneous crops for which no acreages were given. The irrigated area given is exclusive of 1,445 acres in two farms on the island of Oahu, for which no crops or values were reported.

Exclusive of forest products and miscellaneous products, for which no acreage was reported, the average value per acre of the products of unirrigated land in 1899 was $171.52, while the products of irrigated land had an average value per acre of $327. For each of the islands, the values per acre of the products of unirrigated and irrigated lands, respectively, are as follows: Hawaii, $183.91 and $271.37; Kauai, $81.57 and $284.42; Maui, $88.86 and $392.47; Molokai, $76.44 and $172.50; and Oahu, $121.16 and $348.35. No crops were grown in 1899 on the island of Niihau, and the only crop reported on Lanai was 200 acres of sugar cane, all of which was irrigated. This cane had not matured at the time of the enumeration, but an estimated value of $80 per acre is given.

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 170. WASHINGTON, D. C. May 19, 1902.

AGRICULTURE.

MINNESOTA.

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

SIR: I have the honor to transmit herewith, for publication in bulletin form, the statistics of agriculture in the state of Minnesota, taken in accordance with the provisions of section 7 of the act of March 3, 1899. This section requires that—

> The schedules relating to agriculture shall comprehend the following topics: Name of occupant of each farm, color of occupant, tenure, acreage, value of farm and improvements, acreage of different products, quantity and value of products, and number and value of live stock. All questions as to quantity and value of crops shall relate to the year ending December thirty-first next preceding the enumeration.

A "farm," as defined by the Twelfth Census, includes all the land, under one management, used for raising crops and pasturing live stock, with the wood lots, swamps, meadows, etc., connected therewith. It includes also the house in which the farmer resides, and all other buildings used by him in connection with his farming operations.

The farms of Minnesota, June 1, 1900, numbered 154,659, and had a value of $669,522,315. Of this amount $110,220,415, or 16.5 per cent, represents the value of buildings, and $559,301,900, or 83.5 per cent, the value of land and improvements other than buildings. On the same date the value of farm implements and machinery was $30,099,230, and that of live stock, $89,063,097. These values, added to that of farms, give $788,684,642, the "total value of farm property."

The products derived from domestic animals, poultry, and bees, including animals sold and animals slaughtered on farms, are referred to in this bulletin as "animal products." The total value of such products, together with the value of all crops, is termed "total value of farm products." This value for 1899 was $161,217,304, of which amount $45,522,367, or 28.2 per cent, represents the value of animal products, and $115,694,937, or 71.8 per cent, the value of crops, including forest products cut or produced on farms. The total value of farm products for 1899 exceeds that reported for 1889 by $89,979,074, or 126.3 per cent. A part of this increase, however, is doubtless due to a more detailed enumeration of the products of 1899 than of those of 1889.

The "gross farm income" is obtained by deducting from the total value of farm products the value of the products fed to live stock on the farms of the producers. In 1899 the reported value of products fed was $33,257,480, leaving $127,959,824 as the gross farm income. The ratio which this latter amount bears to the "total value of farm property" is referred to in this bulletin as the "percentage of gross income upon investment." For Minnesota in 1899 it was 16.2 per cent.

As no reports of expenditures for taxes, interest, insurance, feed for stock, and similar items have been obtained by any census, no statement of net farm income can be given.

The statistics presented in this bulletin will be treated in greater detail in the final report on agriculture in the United States, which will be published about June 1, 1902. This publication is designed to present merely a summarized advance statement for Minnesota.

Very respectfully,

L. G. Powers.

Chief Statistician for Agriculture.

CP 15M

AGRICULTURE IN MINNESOTA.

GENERAL STATISTICS.

Minnesota has a total land area of 79,205 square miles, or 50,691,200 acres, of which 26,248,498 acres, or 51.8 per cent, are included in farms.

The surface of the state is undulating, and although there are no mountains or foothills, it is the natural watershed of all that part of the North American continent lying east of the Rocky Mountains. It contains the remote sources of three great water systems, the Mississippi River, the Red River of the North, and the St. Louis River, the last named eventually finding its way to the Atlantic Ocean through the Great Lakes and the St. Lawrence River.

Partly as a result of this fact, four distinct divisions may be recognized, differing in soil and vegetable growth. The soil of the northwestern section is a rich alluvial deposit, admirably adapted to wheat growing. The northeastern slope contains important mineral deposits and forest tracts, and yields only fair crops. The north central division comprises an extensive area, heavily timbered with pine, its soil being generally sandy. In the southern division, comprising almost the entire southern half of the state, woodlands and rolling prairies alternate. This land is unsurpassed in fertility and productiveness.

NUMBER AND SIZE OF FARMS.

Table 1 gives by decades since 1850 the number of farms, the total and average acreage, and the per cent of farm land improved.

TABLE 1.—FARMS AND FARM ACREAGE: 1850 TO 1900.

YEAR.	Number of farms.	NUMBER OF ACRES IN FARMS.				Per cent of farm land improved.
		Total.	Improved.	Unimproved.	Average.	
1900	154,659	26,248,498	18,442,585	7,805,913	169.7	70.3
1890	116,581	18,663,645	11,127,953	7,535,692	160.1	59.6
1880	92,386	13,403,019	7,246,693	6,156,326	145.1	54.1
1870	46,500	6,483,828	2,322,102	4,161,726	139.4	35.8
1860	18,181	2,711,963	556,250	2,155,718	149.2	20.5
1850	157	28,881	5,035	23,846	184.0	17.4

The number and aggregate area of farms have increased rapidly since 1850, and between 1890 and 1900 the rates of gain were 32.7 per cent and 40.6 per cent, respectively. The peculiar adaptability of the soil and climate of northwestern Minnesota to the growing of cereals and hay, became generally known just prior to 1880; the rapid development of the industry which followed, resulted in the conversion of vast uncultivated areas into highly productive farms, and it is chiefly for this reason that, since that date, the total farm acreage has increased more rapidly than the number of farms. The division of farm holdings in the southern portion of the state, where the land is more intensively cultivated, has not been sufficient to overcome the expansive movement in the northwestern section; hence a steady increase in the average size of farms is noted for the past four decades. This gain has been attended by a correspondingly marked increase in the per cent of farm land improved.

FARM PROPERTY AND PRODUCTS.

Table 2 presents a summary of the principal statistics relating to farm property and products for each census year, beginning with 1850.

TABLE 2.—VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND OF FARM PRODUCTS: 1850 TO 1900.

YEAR.	Total value of farm property.	Land, improvements, and buildings.	Implements and machinery.	Live stock.	Farm products.[1]
1900	$788,684,642	$669,522,315	$30,099,230	$89,063,097	$161,217,304
1890	414,701,626	340,059,470	16,916,473	57,725,683	71,288,230
1880	238,718,864	193,724,260	13,089,783	31,904,821	49,468,951
1870[2]	124,687,403	97,847,442	6,721,120	20,118,841	[3]33,446,400
1860	32,166,946	27,505,922	1,618,183	3,642,841	----------
1850	270,788	161,948	15,981	92,859	----------

[1] For year preceding that designated.
[2] Values for 1870 were reported in depreciated currency. To reduce to specie basis of the other figures, they must be diminished by one-fifth.
[3] Includes betterments and additions to live stock.

Between 1850 and 1900 the total value of farm property increased $788,413,854, and in the last decade, $373,983,016, or 90.2 per cent. Of the latter amount, $329,462,845, or 88.1 per cent, represents the increase in the value of farms; $13,182,757, or 3.5 per cent, in that of implements and machinery; and $31,337,414, or 8.4 per cent, in that of live stock. The value of farm products for 1899 exceeds that for 1889 by 126.3 per cent, but a part of this gain, and of that in implements and machinery, is doubtless due to a more detailed enumeration in 1900 than heretofore.

COUNTY STATISTICS.

Table 3 gives an exhibit of general agricultural statistics by counties.

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUES OF FARM PROPERTY.					EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.	Value of products not fed to live stock.	Labor.	Fertilizers.
The State	154,659	149,073	26,248,498	18,442,585	$559,301,900	$110,220,415	$30,099,230	$89,063,097	$127,959,824	$16,657,820	$251,120
Aitkin	768	751	112,712	20,707	667,030	195,600	48,620	215,147	207,477	12,520	190
Anoka	1,356	1,295	174,698	87,072	2,692,680	766,750	152,370	537,146	729,466	75,280	3,130
Becker	1,947	1,856	304,968	144,459	3,373,800	813,860	283,280	790,309	1,062,238	109,010	1,740
Beltrami	1,243	1,206	186,716	23,622	945,570	166,840	63,850	220,774	224,088	14,030	30
Benton	1,275	1,257	180,017	90,595	2,636,300	572,750	180,560	501,117	568,640	48,530	2,500
Bigstone	1,044	996	276,968	243,724	4,489,290	766,270	270,310	625,702	1,423,116	206,700	700
Blue Earth	3,186	3,087	450,612	364,138	16,128,840	3,058,230	671,770	2,124,128	2,805,152	270,660	3,980
Brown	1,857	1,799	372,680	313,492	9,818,860	1,740,920	434,280	1,335,561	1,962,215	237,180	3,310
Carlton	605	596	67,092	13,554	542,630	205,970	34,720	156,344	154,088	58,300	1,210
Carver	1,975	1,953	216,868	121,224	6,242,980	1,602,840	365,580	1,130,843	1,546,166	130,590	890
Cass	668	642	104,577	20,585	533,690	113,650	40,300	168,095	164,465	3,740	120
Chippewa	1,687	1,576	342,301	308,700	6,515,760	1,141,660	385,430	994,325	1,625,902	311,400	1,150
Chisago	1,969	1,934	214,778	85,277	3,419,310	1,374,640	297,210	815,166	1,081,154	102,420	3,390
Clay	1,994	1,852	546,636	438,802	8,767,950	1,224,020	574,430	1,371,832	2,544,500	486,650	940
Cook	36	36	5,523	327	32,880	28,620	1,810	5,695	8,747	3,940	----------
Cottonwood	1,568	1,489	370,715	341,627	7,601,560	2,149,710	481,930	1,145,457	1,745,332	245,950	2,250
Crow Wing	1,241	1,206	170,509	36,179	1,125,730	378,160	97,190	350,112	367,463	23,690	450
Dakota	2,152	2,103	332,298	272,490	8,342,395	1,684,280	450,490	1,316,181	2,163,589	229,030	7,200
Dodge	1,651	1,613	258,979	219,508	6,661,170	1,421,610	332,610	1,234,222	1,519,532	183,570	1,100
Douglas	2,407	2,348	348,302	192,081	5,634,650	1,329,410	368,090	940,891	1,507,509	259,390	12,570
Faribault	2,282	2,159	442,042	394,000	16,484,500	2,624,610	666,850	1,964,978	2,606,911	322,450	5,780
Fillmore	3,477	3,392	521,261	389,386	14,240,595	2,801,725	653,260	2,662,528	3,062,713	299,160	13,030
Freeborn	2,691	2,583	436,748	342,876	11,766,250	2,778,900	596,430	2,270,676	2,699,917	386,630	790
Goodhue	3,210	3,138	470,062	374,593	12,285,550	3,088,240	631,220	2,044,607	3,027,194	509,150	5,460
Grant	1,245	1,182	284,039	221,610	4,401,060	720,330	282,330	687,111	1,303,708	184,140	1,800
Hennepin	3,684	3,525	297,052	197,570	13,988,070	3,742,080	528,020	1,701,810	3,012,397	378,750	8,430
Houston	2,130	2,064	331,986	169,810	6,619,250	1,575,760	360,500	1,888,570	1,630,451	135,820	1,970
Hubbard	641	625	99,143	29,509	703,720	119,150	55,010	139,524	188,155	20,590	160
Isanti	2,044	1,978	221,576	85,747	2,552,340	978,690	212,790	587,709	820,890	96,510	4,960
Itasca	217	211	27,641	4,274	188,880	77,530	16,060	55,727	70,222	8,560	230
Jackson	1,949	1,860	404,014	354,253	10,401,960	1,615,670	544,100	1,581,924	1,810,921	186,980	1,590
Kanabec	749	724	127,475	18,332	1,019,480	248,310	47,230	201,747	182,471	18,110	----------
Kandiyohi	2,265	2,220	443,146	340,722	8,094,340	1,807,980	461,290	1,351,416	1,984,622	385,430	5,410
Kittson	1,266	1,129	339,677	205,544	4,538,830	804,110	336,980	848,558	1,415,082	351,600	4,320
Lac qui Parle	1,951	1,819	454,705	391,711	9,399,940	1,499,970	556,550	1,374,090	2,434,690	372,400	3,030
Lake	19	19	2,435	243	16,300	9,200	380	4,885	6,539	700	----------
Lesueur	2,472	2,380	288,609	148,939	8,041,680	1,579,270	394,660	1,111,167	1,707,797	135,360	1,100
Lincoln	1,340	1,285	300,274	237,636	5,658,450	861,580	339,190	818,125	1,344,889	134,060	4,710
Lyon	1,632	1,554	398,432	334,236	8,649,090	1,315,860	488,300	1,316,225	2,124,409	234,480	1,720
McLeod	2,335	2,264	302,091	223,943	8,740,020	1,942,190	428,420	1,331,321	1,949,713	161,980	480
Marshall	2,464	2,405	543,190	340,882	5,717,310	944,720	490,150	1,399,277	1,887,997	376,640	3,420
Martin	2,138	2,069	420,792	383,459	12,100,790	1,853,840	597,330	1,698,799	1,968,386	194,250	3,290
Meeker	2,511	2,422	345,982	258,314	8,215,350	1,788,860	463,360	1,373,140	1,955,417	222,500	1,350
Millelacs	1,022	978	95,660	31,406	1,379,540	298,550	82,550	321,163	304,518	15,660	110
Morrison	2,400	2,340	331,816	148,355	3,965,240	967,380	337,570	909,769	1,102,016	78,430	6,120
Mower	2,447	2,370	432,906	394,801	14,935,660	2,635,510	615,540	2,095,488	2,707,766	327,820	830
Murray	1,713	1,550	385,061	338,656	9,438,590	1,181,630	486,820	1,309,205	1,978,560	126,050	930
Nicollet	1,454	1,421	272,290	209,259	7,006,810	1,623,360	388,040	1,138,152	1,643,601	330,030	2,400
Nobles	1,751	1,666	420,218	298,238	11,298,380	1,363,730	490,220	1,439,293	2,208,819	261,050	720
Norman	1,988	1,796	428,985	316,597	6,882,260	1,120,750	456,750	1,155,870	1,402,486	295,260	3,110
Olmsted	2,539	2,455	405,889	327,419	13,592,810	2,684,110	555,160	2,005,259	2,559,762	240,630	4,360
Ottertail	6,227	6,016	944,732	505,358	12,478,640	3,042,960	957,600	2,416,382	3,541,557	541,760	5,940
Pine	1,416	1,393	148,459	30,637	1,440,070	387,250	92,620	353,484	318,576	13,860	----------
Pipestone	997	965	241,623	208,280	5,611,290	672,480	250,330	746,568	1,258,276	119,300	1,720
Polk	4,340	4,205	978,281	651,755	13,802,800	2,252,100	1,044,520	2,481,721	3,662,269	841,780	10,400
Pope	1,872	1,761	378,812	286,540	5,082,360	1,180,240	352,310	1,010,422	1,567,910	328,480	8,330
Ramsey	923	897	60,783	38,967	3,989,910	1,056,280	145,900	429,883	1,098,889	122,790	9,100
Red Lake	1,385	1,345	258,367	146,274	2,119,770	485,060	214,820	637,564	717,978	86,450	1,470
Redwood	2,348	2,202	508,599	417,937	12,467,480	1,702,830	598,600	1,725,879	2,356,769	427,150	2,180
Renville	3,018	2,935	584,659	500,199	13,563,070	2,358,530	709,490	1,908,030	3,235,004	436,920	8,330
Rice	2,672	2,569	305,513	227,779	9,976,890	2,307,820	475,050	1,448,068	2,062,018	158,710	9,670
Rock	1,169	1,122	288,397	267,427	8,163,410	978,990	360,870	1,203,644	1,763,121	192,930	----------
Roseau	1,444	1,434	236,681	74,336	1,422,180	281,890	102,550	413,978	268,188	27,600	220
St. Louis	696	682	59,950	11,406	656,560	259,780	45,710	190,436	283,998	34,830	1,180
Scott	1,649	1,605	214,254	128,320	5,993,540	1,455,120	275,420	1,014,640	1,390,878	104,140	7,350
Sherburne	1,054	1,016	179,105	98,539	2,063,230	572,070	147,720	637,126	651,902	49,110	50
Sibley	2,177	2,118	357,846	277,643	9,362,280	2,020,300	453,590	1,312,198	1,959,182	207,680	3,180
Stearns	4,449	4,388	731,323	420,428	13,022,280	2,619,020	744,390	2,248,124	3,121,368	285,040	3,990
Steele	1,801	1,747	263,371	226,873	9,507,150	1,717,090	368,520	1,373,798	1,772,871	200,130	4,260
Stevens	1,156	1,076	312,081	350,151	4,734,980	839,790	326,930	751,561	1,365,509	240,680	3,450
Swift	1,795	1,684	414,950	343,863	6,854,510	1,156,730	401,830	1,048,666	1,698,333	304,070	1,780
Todd	3,034	2,931	365,988	151,002	6,027,330	1,093,040	356,020	948,679	1,162,160	120,790	2,460
Traverse	1,086	1,008	321,708	266,563	5,314,080	792,540	282,000	686,229	1,476,927	394,630	4,170
Wabasha	1,917	1,803	324,531	227,689	8,600,910	1,797,960	398,360	1,282,940	1,940,613	247,090	2,590
Wadena	990	966	141,375	61,284	1,314,530	284,990	112,760	322,641	409,610	27,000	100

TABLE 3.—NUMBER AND ACREAGE OF FARMS, AND VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, JUNE 1, 1900, WITH VALUE OF PRODUCTS OF 1899 NOT FED TO LIVE STOCK, AND EXPENDITURES IN 1899 FOR LABOR AND FERTILIZERS, BY COUNTIES—Continued.

COUNTIES.	NUMBER OF FARMS.		ACRES IN FARMS.		VALUES OF FARM PROPERTY.				Value of products not fed to live stock.	EXPENDITURES.	
	Total.	With buildings.	Total.	Improved.	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		Labor.	Fertilizers.
Waseca	1,672	1,631	262,467	225,134	$9,164,340	$1,727,340	$369,390	$1,241,184	$1,613,400	$165,140	$3,530
Washington	1,843	1,796	214,858	145,351	6,130,030	1,699,530	310,910	921,680	1,452,895	187,420	2,810
Watonwan	1,291	1,212	255,815	219,558	7,006,990	1,225,400	302,890	1,031,282	1,261,126	160,900	2,260
Wilkin	1,117	1,062	318,998	267,764	5,460,700	745,930	323,400	722,235	1,488,039	198,970	2,880
Winona	2,359	2,286	371,659	230,698	10,182,780	2,312,390	461,120	1,415,519	1,913,093	243,280	4,150
Wright	3,992	3,891	383,966	215,436	9,493,540	2,414,470	553,970	1,646,309	2,267,059	139,240	3,610
Yellow Medicine	1,872	1,817	423,714	353,000	9,030,800	1,336,790	456,420	1,245,516	2,253,540	293,880	1,070
Red Lake[1]	144	141	4,752	2,276	28,190	23,740	6,180	14,600	22,942	2,280	----------
White Earth[1]	198	188	82,206	22,545	787,090	90,080	48,890	79,601	94,448	5,060	480
Winnibigoshish[1]	6	3	534	87	2,770	550	260	515	623	20	----------

[1] Indian reservation.

Increases since 1890 in the number of farms are shown for all counties except Nicollet, which reports only two farms less, and Polk, from which, in 1897, a tract was taken to form part of Red Lake county. Over one-sixth of the counties report more than twice as many farms in 1900 as in 1890, and in many of the remaining counties the increases were nearly as great.

All counties show increases in the total farm acreage, and all except Lake and Scott in the acreage of improved land. The improved area has doubled in more than one-third of the counties.

The average size of farms for the state is 169.7 acres, and the county averages show few marked variations from that figure. The average is smallest for the counties in which dairying is the chief industry, and largest for the counties along the northwestern border, which are devoted to the growing of cereals and to stock raising.

The average value of farms for the state is $4,329; the total values having more than doubled in one-half of the counties. All except the adjoining counties of Anoka, Dakota, and Ramsey, in the southeastern part, and St. Louis, in the northern part of the state, show substantial gains over the values reported in 1890.

The value of implements and machinery has more than doubled in nearly one-half of the counties in the last ten years, Lake county alone showing a decrease.

The increases in the value of live stock have been general throughout the state, but are relatively smaller in the southeastern section than elsewhere. Nicollet and Ramsey are the only counties in which the value of live stock in 1900 is less than in 1890.

The average expenditure per farm for labor, including the value of board furnished, was $107.71, the smallest amounts being paid in the northeastern counties, which comprise the mineral region.

Expenditures for fertilizers were considerably greater in 1899 than in 1889. Lesueur, McLeod, Nobles, Pine, Renville, Rock, and Wadena counties show decreases, but in most of the remaining counties the amounts thus expended have doubled.

FARM TENURE.

Table 4 gives a comparative exhibit of farm tenure for 1880, 1890, and 1900. The farms operated by tenants are divided into two groups, designated as farms operated by "cash tenants" and by "share tenants." These groups comprise, respectively: (1) Farms operated by individuals who pay a cash rental or a stated amount of labor or farm produce; (2) farms operated by individuals who pay as rental a stated share of the products. In Table 5 the tenure of farms for 1900 is given by race of farmer. The farms under the classification "owners" in Table 4 are subdivided in Table 5 into groups designated as farms operated by "owners," "part owners," "owners and tenants," and "managers." These terms denote, respectively: (1) Farms operated by individuals who own all the land they cultivate; (2) farms operated by individuals who own a part of the land and rent the remainder from others; (3) farms operated under the joint direction and by the united labor of two or more individuals, one owning the farm or a part of it, and the other, or others, owning no part, but receiving for supervision or labor a share of the products; and (4) farms operated by individuals who receive for their supervision and other services a fixed salary from the owners.

TABLE 4.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES: 1880 TO 1900.

YEAR.	Total number of farms.	NUMBER OF FARMS OPERATED BY—			PER CENT OF FARMS OPERATED BY—		
		Owners.[1]	Cash tenants.	Share tenants.	Owners.[1]	Cash tenants.	Share tenants.
1900	154,659	127,904	5,129	21,626	82.7	3.3	14.0
1890	116,851	101,747	3,421	11,683	87.1	2.9	10.0
1880	92,386	83,933	1,251	7,202	90.8	1.4	7.8

[1] Including "part owners," "owners and tenants," and "managers."

TABLE 5.—NUMBER AND PER CENT OF FARMS OF SPECIFIED TENURES, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER.

PART 1.—NUMBER OF FARMS OF SPECIFIED TENURES.

RACE.	Total number of farms.	Owners.	Part owners.	Owners and tenants.	Managers.	Cash tenants.	Share tenants.
The State	154,659	111,248	14,805	756	1,095	5,129	21,626
White	154,287	110,906	14,796	756	1,090	5,124	21,615
Colored	372	342	9	----	5	5	11
Indian	341	326	7	----	3	----	5
Negro	31	16	2	----	2	5	6

PART 2.—PER CENT OF FARMS OF SPECIFIED TENURES.

The State	100.0	71.9	9.6	0.5	0.7	3.3	14.0
White	100.0	71.9	9.6	0.5	0.7	3.3	14.0
Colored	100.0	92.0	2.4	----	1.3	1.3	3.0

Between 1890 and 1900 the number of farms operated by owners increased 25.7 per cent; cash tenant farms increased 49.9 per cent; and share tenant farms, 85.1 per cent. In 1890, 77.4 per cent of all tenants were share tenants, and in 1900, 80.8 per cent. The greatest relative numbers of share tenants are in the southwestern section of the state. The greatest relative numbers of owners are in the northwestern and north central sections of the state where the land has been entered by homesteaders, over 90 per cent of all farmers in those regions being owners.

No previous census has reported the number of farms operated by "part owners," "owners and tenants," or "managers," but it is believed that the number conducted by the last-named class is constantly increasing.

FARMS CLASSIFIED BY RACE OF FARMER AND BY TENURE.

Tables 6 and 7 present the principal statistics for farms classified by race of farmer and by tenure.

TABLE 6.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY RACE OF FARMER AND BY TENURE, WITH PERCENTAGES.

RACE OF FARMER, AND TENURE.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	154,659	169.7	26,248,498	100.0	$788,684,642	100.0
White farmers	154,287	169.7	26,182,627	99.8	787,795,188	99.9
Negro farmers	31	144.9	4,493	(1)	99,755	(1)
Indian farmers	341	180.0	61,378	0.2	789,699	0.1
Owners	111,248	153.7	17,093,666	65.1	508,541,250	64.5
Part owners	14,805	246.7	3,651,871	13.9	103,852,403	13.1
Owners and tenants	756	196.3	148,429	0.6	4,515,212	0.6
Managers	1,095	444.0	486,147	1.8	13,693,808	1.7
Cash tenants	5,129	131.1	672,178	2.6	27,057,625	3.4
Share tenants	21,626	194.0	4,196,212	16.0	131,524,344	16.7

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

TABLE 7.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY RACE OF FARMER AND BY TENURE.

RACE OF FARMER, AND TENURE.	AVERAGE VALUES PER FARM OF—					
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	Per cent of gross income on total investment in farm property.
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$3,616	$713	$195	$576	$827	16.2
White farmers	3,621	714	195	576	829	16.2
Negro farmers	2,312	531	90	285	496	15.4
Indian farmers	1,733	222	119	242	281	10.0
Owners	3,153	693	182	543	751	16.4
Part owners	5,139	827	267	748	1,170	16.8
Owners and tenants	4,151	917	222	683	962	16.1
Managers	8,907	1,781	416	1,402	1,852	14.8
Cash tenants	3,896	679	162	538	788	14.9
Share tenants	4,604	685	205	588	939	15.4

Of the 365 farms, each containing 1,000 acres or over, 156 were operated by "owners;" 75, by "part owners;" 73, by "managers;" 48, by "share tenants;" 11, by "cash tenants;" and 2, by "owners and tenants." The farms operated by managers are larger and have a higher gross income per farm than those of any other class of farms grouped by tenure. The ratio which the gross income from farms operated by managers bears to the total value of their farm property is, however, smaller than for the other groups, because of the high average valuation of land and buildings, and the additional fact that some such farms are adjuncts to public institutions and, as such, are not operated primarily for profit.

FARMS CLASSIFIED BY AREA.

Tables 8 and 9 present the principal statistics for farms classified by area.

TABLE 8.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY AREA, WITH PERCENTAGES.

AREA.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	154,659	169.7	26,248,498	100.0	$788,684,642	100.0
Under 3 acres	555	2.3	1,284	(1)	827,521	0.1
3 to 9 acres	1,994	6.3	12,594	0.1	2,860,369	0.4
10 to 19 acres	2,254	13.1	29,453	0.1	3,657,790	0.5
20 to 49 acres	13,278	37.2	494,528	1.9	20,861,702	2.6
50 to 99 acres	30,990	74.8	2,316,708	8.8	83,759,534	10.6
100 to 174 acres	56,785	149.8	8,508,727	32.4	247,691,171	31.4
175 to 259 acres	24,983	215.4	5,371,078	20.5	168,254,982	21.3
260 to 499 acres	20,540	341.0	7,004,447	26.7	198,805,952	25.1
500 to 999 acres	2,965	631.4	1,871,977	7.1	48,600,032	6.2
1,000 acres and over	365	1,747.1	637,702	2.4	13,865,589	1.8

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

TABLE 9.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY AREA.

AREA.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$3,616	$713	$195	$576	$827	16.2
Under 3 acres	444	712	48	287	572	38.3
3 to 9 acres	618	617	50	149	395	27.5
10 to 19 acres	859	520	60	184	300	18.5
20 to 49 acres	948	343	67	213	276	17.6
50 to 99 acres	1,801	456	117	329	441	16.3
100 to 174 acres	3,038	631	178	515	704	16.1
175 to 259 acres	4,829	926	244	749	1,072	15.9
260 to 499 acres	7,148	1,148	335	1,024	1,546	16.0
500 to 999 acres	12,596	1,655	571	1,639	2,565	15.6
1,000 acres and over	29,051	3,676	1,492	3,769	7,579	20.0

The group of farms of 100 to 174 acres each contains more than one-third of all those in the state, showing the relative frequency of quarter-section holdings, and represents nearly one-third of the state totals for acreage and value of farms.

Aside from some exceptions in the groups of farms under 50 acres, the average values of the several classes of farm property and products increase with the size of the farms. The relatively high average value of live stock and the high average gross income shown for farms under 3 acres, are due to the fact that a very large per cent of the farms of this group are dairy or truck farms, which supply city markets. Florists' establishments comprise 8.3 per cent of the farms of this group. The incomes from these industries depend less upon the acreage used than upon the amount of capital invested in buildings, implements, and live stock, and the amounts expended for labor and fertilizers.

The average gross incomes per acre for the various groups classified by area are as follows: Farms under 3 acres, $247.13; 3 to 9 acres, $62.49; 10 to 19 acres, $22.96; 20 to 49 acres, $7.43; 50 to 99 acres, $5.90; 100 to 174 acres, $4.70; 175 to 259 acres, $4.98; 260 to 499 acres, $4.53; 500 to 999 acres, $4.06; 1,000 acres and over, $4.34.

FARMS CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

In Tables 10 and 11 the farms are classified by principal source of income. If the value of the hay and grain raised on any farm exceeds that of any other crop and constitutes at least 40 per cent of the total value of products not fed to live stock, the farm is classified as a "hay and grain" farm. If vegetables are the leading crop, constituting 40 per cent of the value of the products, it is a "vegetable" farm. The farms of the other groups are classified in accordance with the same general principle. "Miscellaneous" farms are those whose operators do not derive 40 per cent of their income from any one class of farm products. Farms with no income in 1899 are classified according to the agricultural operations upon other farms in the same locality.

TABLE 10.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME, WITH PERCENTAGES.

PRINCIPAL SOURCE OF INCOME.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	154,659	169.7	26,248,498	100.0	$788,684,642	100.0
Hay and grain	103,792	193.3	20,062,480	76.4	591,871,332	75.1
Vegetables	4,043	85.6	345,913	1.3	10,566,050	1.3
Fruit	331	33.2	12,667	0.1	962,683	0.1
Live stock	19,488	145.4	2,831,881	10.8	99,664,105	12.6
Dairy produce	9,249	117.7	1,088,988	4.2	36,910,565	4.7
Tobacco	6	62.7	376	(1)	48,585	(1)
Sugar	44	81.0	3,562	(1)	218,647	(1)
Flowers and plants	69	5.3	363	(1)	598,759	0.1
Nursery products	43	101.6	4,370	(1)	891,430	0.1
Miscellaneous	17,549	108.1	1,897,898	7.2	47,457,476	6.0

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

TABLE 11.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY PRINCIPAL SOURCE OF INCOME.

PRINCIPAL SOURCE OF INCOME.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$3,616	$713	$195	$576	$827	16.2
Hay and grain	4,170	719	218	595	924	16.2
Vegetables	1,708	546	103	256	491	18.8
Fruit	1,511	756	83	177	525	20.8
Live stock	3,286	901	188	740	808	15.8
Dairy produce	2,543	697	137	614	616	15.4
Tobacco	7,084	617	113	334	3,188	39.4
Sugar	3,303	753	327	473	892	18.4
Flowers and plants	3,939	4,431	229	79	4,025	46.4
Nursery products	6,481	1,814	374	434	9,129	100.3
Miscellaneous	1,752	492	114	346	442	16.4

Hay and grain farms constitute the leading group, with 67.1 per cent of the number of farms, 76.4 per cent of the acreage, and 75.1 per cent of the value of farm property. The group next in importance is that of live-stock farms, with 12.6 per cent of the number, and 10.8 per cent and 12.6 per cent of the acreage and value, respectively. For the several classes of farms the average values per acre of products not fed to live stock are as follows: Farms deriving their principal income from flowers and plants, $765.14; nursery stock, $89.83; tobacco, $50.88; fruit, $15.79; sugar, $11.01; vegetables, $5.74; live stock, $5.56; dairy produce, $5.24; hay and grain, $4.78; and miscellaneous, $4.09. In computing these averages the total area of the farms of each group is used, and not the acreage devoted to the crop from which the principal income is derived.

The wide variations in the averages and percentages of gross income are largely due to the fact that in computing gross income no deductions are made for expenses involved in operation. For florists' establishments and nurseries, the average expenditure for such items as labor and fertilizers represents a far greater percentage of the gross income than in the case of "live stock" or "miscellaneous" farms. If it were possible to present the average net income, the variations shown would be much smaller.

FARMS CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

Tables 12 and 13 present data relating to farms classified by the reported value of products not fed to live stock.

TABLE 12.—NUMBER AND ACREAGE OF FARMS, AND VALUE OF FARM PROPERTY, JUNE 1, 1900, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK, WITH PERCENTAGES.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	Number of farms.	NUMBER OF ACRES IN FARMS.			VALUE OF FARM PROPERTY.	
		Average.	Total.	Per cent.	Total.	Per cent.
The State	145,659	169.7	26,248,498	100.0	$788,684,642	100.0
$0	1,042	146.5	152,622	0.6	1,959,390	0.3
$1 to $49	2,382	94.9	226,156	0.9	2,404,035	0.3
$50 to $99	4,577	85.4	393,804	1.5	5,367,635	0.7
$100 to $249	17,460	83.8	1,464,016	5.6	26,554,645	3.4
$250 to $499	30,163	104.7	3,158,026	12.0	78,407,925	9.9
$500 to $999	52,240	152.1	7,944,860	30.3	241,646,790	30.6
$1,000 to $2,499	42,590	250.9	10,684,683	40.7	362,205,475	45.9
$2,500 and over	4,105	540.5	2,218,331	8.4	70,138,747	8.9

TABLE 13.—AVERAGE VALUES OF SPECIFIED CLASSES OF FARM PROPERTY, AND AVERAGE GROSS INCOME PER FARM, WITH PER CENT OF GROSS INCOME ON TOTAL INVESTMENT IN FARM PROPERTY, CLASSIFIED BY REPORTED VALUE OF PRODUCTS NOT FED TO LIVE STOCK.

VALUE OF PRODUCTS NOT FED TO LIVE STOCK.	AVERAGE VALUES PER FARM OF—					Per cent of gross income on total investment in farm property.
	Farm property, June 1, 1900.				Gross income (products of 1899 not fed to live stock).	
	Land and improvements (except buildings).	Buildings.	Implements and machinery.	Live stock.		
The State	$8,616	$713	$195	$576	$827	16.2
$0	1,426	163	45	236		
$1 to $49	708	162	37	102	31	3.0
$50 to $99	766	199	41	142	67	5.9
$100 to $249	981	276	62	202	167	11.0
$250 to $499	1,752	415	115	317	367	14.1
$500 to $999	3,212	698	188	528	718	15.5
$1,000 to $2,499	6,186	1,095	300	923	1,424	16.7
$2,500 and over	12,496	2,025	636	1,929	3,777	22.1

Many of the farms reporting no income for 1899 were homesteads taken up too late for cultivation that year. The fact that more than half of them were between 100 and 175 acres in size—the group containing the quarter-section tracts commonly taken up as new holdings—and that four-fifths of them were operated by owners, sustains this view. There were, also, some farms for which no reports of the products of 1899 could be secured, as the persons in charge, June 1, 1900, did not operate the farms the preceding year and could give no definite information concerning the products. To this extent the reports fall short of giving a complete report of farm products in 1899.

LIVE STOCK.

At the request of the various live-stock associations of the country, a new classification of domestic animals was adopted for the Twelfth Census. The age grouping for neat cattle was determined in accordance with their present and prospective relations to the dairy industry and the supply of meat products. Horses and mules are classified by age, and neat cattle and sheep by age and sex. The new classification permits a very close comparison with the figures published in previous census reports.

Table 14 presents a summary of live-stock statistics.

TABLE 14.—NUMBER OF DOMESTIC ANIMALS, FOWLS, AND BEES ON FARMS, JUNE 1, 1900, WITH TOTAL AND AVERAGE VALUES, AND NUMBER OF DOMESTIC ANIMALS NOT ON FARMS.

LIVE STOCK.	Age in years.	ON FARMS.			NOT ON FARMS.
		Number.	Value.	Average value.	Number.
Calves	Under 1	565,994	$4,254,414	$7.52	5,989
Steers	1 and under 2	101,645	2,553,015	15.79	1,458
Steers	2 and under 3	58,635	1,423,199	24.27	705
Steers	3 and over	9,143	313,247	34.26	234
Bulls	1 and over	42,549	1,202,197	28.25	207
Heifers	1 and under 2	211,182	3,299,865	15.63	2,178
Cows kept for milk	2 and over	753,632	21,513,337	28.55	36,051
Cows and heifers not kept for milk	2 and over	68,565	1,689,684	24.64	530
Colts	Under 1	45,504	970,772	21.33	1,116
Horses	1 and under 2	51,399	2,081,557	39.53	1,008
Horses	2 and over	599,566	39,252,715	65.47	33,536
Mule colts	Under 1	722	24,682	34.19	20
Mules	1 and under 2	813	39,020	48.00	31
Mules	2 and over	6,804	422,878	62.15	146
Asses and burros	All ages	161	11,475	71.27	54
Lambs	Under 1	230,550	410,557	1.78	1,196
Sheep (ewes)	1 and over	329,984	1,205,275	3.65	2,788
Sheep (rams and wethers).	1 and over	29,344	124,256	4.23	194
Swine	All ages	1,440,806	5,865,590	4.07	17,845
Goats	All ages	3,821	12,908	3.38	288
Fowls:[1]					
Chickens[2]		7,730,940			
Turkeys		193,143	2,274,649		
Geese		90,975			
Ducks		127,635			
Bees (swarms of)		45,877	167,280	3.65	
Unclassified			525		
Value of all live stock			89,063,097		

[1] The number reported is of fowls over 3 months old. The value is of all, old and young.
[2] Including Guinea fowls.

The total value of live stock on farms, June 1, 1900, was $89,063,097. Of this amount 47.4 per cent represents the value of horses; 24.2 per cent, that of dairy cows; 16.5 per cent, that of other neat cattle; 6.6 per cent, that of swine; 2.6 per cent, that of poultry; 1.9 per cent, that of sheep; and 0.8 per cent, that of all other live stock.

No reports were received concerning the value of live stock not on farms, but it is probable that such animals have higher average values than those on farms. Allowing the same averages, however, the value of all live stock not on farms would be $6,813,280. Exclusive of poultry and bees not on farms, the total value of live stock in the state may be estimated at $95,876,400.

CHANGES IN LIVE STOCK ON FARMS.

The following table shows the changes since 1850 in the numbers of the most important domestic animals.

TABLE 15.—NUMBER OF SPECIFIED DOMESTIC ANIMALS ON FARMS: 1850 TO 1900.

YEAR.	Dairy cows.	Other neat cattle.	Horses.	Mules and asses.	Sheep.[1]	Swine.
1900	753,632	1,117,693	696,469	8,500	359,328	1,440,806
1890	593,908	779,671	481,509	9,511	909,049	858,715
1880	275,545	338,505	257,282	9,019	267,598	381,415
1870	121,467	188,912	93,011	2,350	132,343	148,473
1860	40,344	78,913	17,065	377	13,044	101,371
1850	607	1,395	860	14	80	734

[1] Lambs not included.

Half a century ago there were only 3,690 domestic animals in the state, while the census of 1900 shows a total of 4,376,428. Every decade since 1850 has shown an increase in all classes of live stock, with the exception of sheep, mules, and asses in the last decade. Between 1890 and 1900 the number of mules and asses decreased 10.6 per cent, and sheep of wool-bearing age 10.0 per cent.

Other domestic animals show the following increases since 1890: Dairy cows, 26.9 per cent; other neat cattle, 43.4 per cent; horses, 50.9 per cent; and swine, 68.8 per cent. The relative increase in the number of dairy cows would probably have been greater except for the stricter definition of the term "dairy cows" adopted by the Twelfth Census, by which many animals, so classed in former censuses, were excluded in 1900. The production of milk shows a gain for the decade of 66.2 per cent.

Although in 1900 the enumerators were instructed to report no fowls under 3 months old, while no such limitation was made in 1890, all classes of poultry show marked increases for the decade, as follows: Chickens, 73.8 per cent; ducks, 70.9 per cent; geese, 31.4 per cent; turkeys, 27.5 per cent.

ANIMAL PRODUCTS.

Table 16 is a summarized exhibit of the animal products of 1899.

TABLE 16.—QUANTITIES AND VALUES OF SPECIFIED ANIMAL PRODUCTS, AND VALUES OF POULTRY RAISED, ANIMALS SOLD, AND ANIMALS SLAUGHTERED ON FARMS, IN 1899.

PRODUCTS.	Unit of measure.	Quantity.	Value.
Wool	Pounds	2,612,737	$460,305
Mohair and goat hair	Pounds	556	180
Milk	Gallons	[1]304,017,106	[2]16,623,460
Butter	Pounds	41,188,846	
Cheese	Pounds	290,623	
Eggs	Dozens	43,208,130	4,437,148
Poultry			2,927,717
Honey	Pounds	986,446	118,884
Wax	Pounds	20,626	
Animals sold			16,046,622
Animals slaughtered			4,908,051
Total			45,522,367

[1] Comprises all milk produced, whether sold, consumed, or made into butter or cheese.
[2] Comprises the value of all milk sold and consumed, and of butter and cheese made.

The value of the animal products of the state for 1899 was $45,522,367, or 28.2 per cent of the value of all farm products. Of this amount, 46.0 per cent represents the value of animals sold and animals slaughtered on farms; 36.5 per cent, that of dairy produce; 16.2 per cent, that of poultry and eggs; 1.0 per cent, that of wool, mohair, and goat hair; and 0.3 per cent, that of honey and wax.

ANIMALS SOLD AND ANIMALS SLAUGHTERED.

The value of animals sold and animals slaughtered on farms in 1899 was $20,954,673, or 12.9 per cent of the value of all farm products. Of all farms reporting live stock, 113,276, or 76.4 per cent, report animals slaughtered, the average value per farm being $43.33. Of the number reporting live stock, 97,614, or 65.8 per cent, report sales of live animals, the average receipts per farm being $164.39.

DAIRY PRODUCE.

In 1899 the proprietors of 9,249 farms, or 6.0 per cent of the total number in the state, derived their principal income from the sale of dairy produce. The production of milk in that year was 121,048,133 gallons greater than in 1889, a gain of 66.2 per cent. Notwithstanding the large increase in the number of creameries in the state in the last decade, the amount of butter made on farms increased 18.5 per cent. The increase in cheese factories, however, has been accompanied by a decrease in the production of cheese on farms, amounting to 57.0 per cent.

Of the $16,623,460 given in Table 16 as the reported value of dairy produce, $5,508,769, or 33.1 per cent, represents the value of such produce consumed on farms, and $11,114,691, or 66.9 per cent, the amount derived from sales. The tabulated returns covering the dairying industry of the state indicate that as a result of a confusion between the terms "butter fat" and "butter" a considerable amount of the former was reported by the enumerators as butter sold instead of milk sold. Detailed consideration will be given to this fact in the final report.

POULTRY AND EGGS.

Of the $7,364,865 given as the value of poultry products in 1899, 60.2 per cent represents the value of eggs produced, and 39.8 per cent, that of poultry raised. There were 43,208,130 dozens of eggs reported in 1900, more than twice as many as ten years before.

WOOL.

More wool was reported for 1899 than for any previous year, the increase between 1889 and 1899 having been from 312,861 fleeces weighing 1,945,249 pounds to 376,009 fleeces weighing 2,612,737 pounds, showing an increase in the average weight of fleeces from 6.2 pounds in 1889 to 6.9 pounds in 1899. Winona, Olmsted, Fillmore, and Murray counties lead in the production of wool.

HONEY AND WAX.

There were 986,446 pounds of honey and 20,626 pounds of wax reported in 1900, a decrease of 15.0 per cent in the amount of honey and an increase of 71.2 per cent in the amount of wax produced, as compared with 1890. Winona, Hennepin, and Morrison counties lead in the production of honey.

HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS.

Table 17 presents, for the leading groups of farms, the number of farms reporting horses and dairy cows, the total number of these animals, and the average number per farm. In computing these averages, only farms which report the kind of stock under consideration are included.

TABLE 17.—HORSES AND DAIRY COWS ON SPECIFIED CLASSES OF FARMS, JUNE 1, 1900.

CLASSES.	HORSES.			DAIRY COWS.		
	Farms reporting.	Number.	Average per farm.	Farms reporting.	Number.	Average per farm.
Total	140,519	696,469	5.0	139,438	758,632	5.4
White farmers	140,231	695,466	5.0	139,310	758,250	5.4
Colored farmers	288	1,003	3.5	128	382	3.0
Owners[1]	115,122	559,065	4.9	115,268	622,441	5.4
Managers	973	10,001	10.3	910	7,465	8.2
Cash tenants	4,457	19,521	4.4	4,232	27,338	6.5
Share tenants	19,967	107,882	5.4	19,028	96,388	5.1
Under 20 acres	3,217	6,324	2.0	3,279	10,195	3.1
20 to 99 acres	36,488	102,660	2.8	36,931	128,751	3.5
100 to 174 acres	53,323	231,214	4.3	52,423	263,317	5.0
175 to 259 acres	24,142	141,730	5.9	23,782	161,683	6.8
260 acres and over	23,349	214,541	9.2	23,023	189,686	8.2
Hay and grain	95,643	524,751	5.5	93,548	493,517	5.3
Vegetable	3,298	9,041	2.7	2,984	8,311	2.8
Fruit	291	628	2.2	240	496	2.1
Live stock	18,186	85,420	4.7	18,802	117,667	6.3
Dairy	8,347	31,008	3.7	9,249	77,274	8.4
Miscellaneous[2]	14,754	45,621	3.1	14,615	56,367	3.9

[1] Including "part owners" and "owners and tenants."
[2] Including tobacco farms, sugar farms, florists' establishments, and nurseries.

CROPS.

The following table gives the statistics of the principal crops of 1899.

TABLE 18.—ACREAGES, QUANTITIES, AND VALUES OF THE PRINCIPAL FARM CROPS IN 1899.

CROPS.	Acres.	Unit of measure.	Quantity.	Value.
Corn	1,441,580	Bushels	47,256,920	$11,337,105
Wheat	6,560,707	Bushels	95,278,660	50,601,948
Oats	2,201,325	Bushels	74,054,150	15,829,804
Barley	877,845	Bushels	24,314,240	7,220,739
Rye	118,869	Bushels	1,866,150	783,852
Buckwheat	6,700	Bushels	82,687	43,741
Flaxseed	566,801	Bushels	5,895,479	5,898,556
Kafir corn	43	Bushels	1,096	366
Clover seed		Bushels	8,034	34,536
Grass seed		Bushels	553,939	494,765
Hay and forage	3,157,690	Tons	4,411,667	14,585,281
Tobacco	117	Pounds	127,780	12,869
Hops		Pounds	51	9
Broom corn	149	Pounds	76,960	4,121
Dry beans	3,290	Bushels	86,317	49,685
Dry peas	670	Bushels	9,021	9,338
Potatoes	146,659	Bushels	14,043,327	8,408,997
Sweet potatoes	4	Bushels	136	149
Onions	923	Bushels	235,564	180,494
Miscellaneous vegetables	27,438			1,372,907
Maple sugar		Pounds	29,580	2,733
Maple sirup		Gallons	1,079	939
Sorghum cane	2,283	Tons	1,282	2,818
Sorghum sirup		Gallons	157,605	56,896
Sugar beets	2,114	Tons	15,959	59,826
Small fruits	3,092			339,569
Grapes	[1]230	Centals	5,733	[2]15,593
Orchard fruits	[1]20,081	Bushels	143,655	[3]109,050
Nuts				597
Forest products				2,602,335
Flowers and foliage plants	143			288,055
Seeds	81			9,249
Nursery products	1,127			383,105
Miscellaneous	1			[4]4,910
Total	15,189,962			115,694,937

[1] Estimated from number of vines or trees.
[2] Including the value of raisins, wine, etc.
[3] Including the value of cider, vinegar, etc.
[4] The greater part of this value was derived from products for which no acreage was reported.

Of the total value of crops in 1899, wheat contributed 43.7 per cent; other cereals, including Kafir corn, 30.4 per cent; hay and forage, 12.6 per cent; vegetables, including potatoes, sweet potatoes, and onions, 4.3 per cent; forest products, 2.2 per cent; and all other products, 6.8 per cent.

Wheat occupied the largest area devoted to any one crop, having an acreage larger than that of all other cereals combined, and more than twice that of hay and forage, which ranks second.

The average values per acre of the various crops were as follows: Flowers and plants, $2,014.37; onions, $141.38; small fruits, $109.82; miscellaneous vegetables, $50.04; sugar beets, $28.30; potatoes, $23.24; cereals, $7.66; and hay and forage, $4.62. The crops yielding the greatest returns per acre were grown upon highly improved land. Their production required a relatively great amount of labor, and large expenditures for fertilizers.

CEREALS.

The following table is an exhibit of the changes in cereal production since 1849.

TABLE 19.—ACREAGE AND PRODUCTION OF CEREALS: 1849 TO 1899.

PART 1.—ACREAGE.

YEAR.[1]	Barley.	Buckwheat.	Corn.	Oats.	Rye.	Wheat.
1899	877,845	6,700	1,441,580	2,201,325	118,869	6,560,707
1889	358,510	22,090	901,690	1,579,258	62,869	3,372,627
1879	116,020	3,677	438,737	617,469	13,614	3,044,670

[1] No statistics of acreage were secured prior to 1879.

PART 2.—BUSHELS PRODUCED.

1899	24,314,240	82,687	47,256,920	74,054,150	1,866,150	95,278,660
1889	9,100,683	281,705	24,696,446	49,958,791	1,252,663	52,300,247
1879	2,972,965	41,756	14,831,741	28,382,158	215,245	84,601,030
1869	1,032,024	52,438	4,743,117	10,678,261	78,088	18,866,073
1859	109,668	28,052	2,941,952	2,176,002	121,411	2,186,993
1849	1,216	515	16,725	30,582	125	1,401

In 1879 the total area devoted to the cereals shown in the above table was 4,234,187 acres; in 1889, 6,297,044 acres; and in 1899, 11,207,026 acres. Increases in acreage in the decade from 1889 to 1899 were as follows: Barley, 144.9 per cent; wheat, 94.5 per cent; rye, 89.1 per cent; corn, 59.9 per cent; and oats, 39.4 per cent. For buckwheat, a decrease of 69.7 per cent is shown. The total number of bushels of all grains produced in 1849 was 50,564, and in 1899, 242,852,807.

Of the total acreage under cereals in 1899, 58.5 per cent was devoted to wheat; 19.6 per cent to oats; 12.9 per cent to corn; and 9.0 per cent to barley, rye, and buckwheat. While the cereals are quite generally distributed throughout the state, wheat is grown most extensively in the northwestern counties, and corn and oats in the southwestern counties.

FLAX.

Flax was grown in 1899 by 31,647 farmers, or 20.5 per cent of the total number in the state. The area devoted to this crop increased from 303,635 acres in 1889 to 566,801

acres in 1899, a gain of 86.7 per cent, and the yield increased from 2,721,987 to 5,895,479 bushels of seed. The average yield per acre was 9.0 bushels in 1889, and 10.4 bushels in 1899. In 1899 the average acreage of flax for each farm reporting this crop was 17.9 acres, and the average value of product, $186.39.

Clay, Wilkin, Grant, Traverse, Stevens, and Murray counties, and other counties on or near the western and southern borders, report extensive areas in this crop. Very little flax is grown north and east of a line drawn from the extreme northwest to the extreme southeast of the state.

HAY AND FORAGE.

In 1900, 132,851 farmers, or 86.0 per cent of the total number, reported hay or forage crops. They obtained an average yield, exclusive of cornstalks, of 1.37 tons per acre. The total area devoted to hay and forage in 1899 was 3,157,690 acres, an increase of 12.9 per cent over that of ten years before. Of this area, 2,196,623 acres, or 69.6 per cent, produced 2,842,234 tons of wild, salt, and prairie grasses. In 1899 the acreages and yields of the various other kinds of hay and forage were as follows: Millet and Hungarian grasses, 58,339 acres and 93,954 tons; alfalfa or lucern, 658 acres and 1,781 tons; clover, 74,669 acres and 128,767 tons; other tame and cultivated grasses, 754,246 acres and 1,114,459 tons; grains cut green for hay, 26,304 acres and 45,633 tons; crops grown for forage, 46,851 acres and 112,500 tons; and corn stalks, 48,100 acres and 72,339 tons.

In Table 18 the production of cornstalks is included under "hay and forage," but the acreage is included under corn, as the forage secured was only a secondary product of the corn crop.

TOBACCO.

Tobacco was first reported in Minnesota in 1860, when 38,938 pounds were raised. The production fluctuated greatly during the succeeding decades, the quantity produced in 1899 being a little over three times as great as in 1859, but nearly six times as great as that reported in 1889. The enumeration of June 1, 1900, shows that tobacco was raised by 186 farmers, who obtained from 117 acres a yield of 127,730 pounds, valued at $12,869. In Fillmore county 28 farmers obtained from 86 acres a yield of 105,420 pounds, or 82.5 per cent of all tobacco raised in the state. The average value was 10 cents per pound.

ORCHARD FRUITS.

The changes in orchard fruits since 1890 are shown in the following table.

TABLE 20.—ORCHARD TREES AND FRUITS: 1890 AND 1900.

FRUITS.	NUMBER OF TREES.		BUSHELS OF FRUIT.	
	1900.	1890.	1899.	1889.
Apples	875,905	165,294	120,143	80,131
Apricots	87	221	2	
Cherries	19,882	1,242	960	13
Peaches	1,626	384	190	5
Pears	3,602	882	226	96
Plums and prunes	191,313	47,458	21,820	5,358

The cultivation of orchard fruits, while general throughout the state, is most extensive in the south and southeast; nearly all counties in which orchard products were valued at more than $5,000 in 1899 were located in those sections. In 1899 the total value of orchard products was $109,050, of which amount 36.1 per cent was contributed by the six southeastern counties of Wabasha, Winona, Goodhue, Fillmore, Dakota, and Nicollet, ranking in the order named.

The total number of trees shows a marked gain in the last decade, the number of apple trees having increased more than fivefold and plum and prune trees more than fourfold.

In 1899, as in 1889, the apple was the leading fruit, both in the number of trees and in the quantity of product. Of the total number of trees reported in 1900, 79.9 per cent were apple trees; 17.4 per cent, plum and prune trees; 1.8 per cent, cherry trees; and 0.9 per cent, all other fruit trees. In addition to the number of trees shown in Table 20, unclassified orchard trees to the number of 4,029 were reported, with a yield of 314 bushels of fruit.

The value of orchard products, given in Table 18, includes the value of 194 barrels of cider, 106 barrels of vinegar, and 500 pounds of dried and evaporated fruits.

Seasonal variations so largely affect the quantity of fruit produced in any given year, that comparisons between the crops of 1889 and 1899 have little significance.

VEGETABLES.

The value of the vegetables grown in 1899, including potatoes, sweet potatoes, and onions, was $4,912,547. Of this amount, the value of potatoes constitutes 69.4 per cent. Potatoes were grown in every county in the state, being reported by 116,595 farmers, or 75.4 per cent of the total number. Isanti and Chisago counties reported over one million bushels each. Aside from the land devoted to potatoes, sweet potatoes, and onions, 27,438 acres were used in the growing of miscellaneous vegetables. Of this latter area the products of 19,489 acres were not reported in detail. Of the remaining 7,949 acres, 2,633 were devoted to sweet corn, 1,759 to cabbage, 813 to muskmelons, 701 to tomatoes, 494 to cucumbers, 435 to watermelons, 316 to turnips, 190 to beets, 169 to squashes, 94 to peas, 88 to carrots, and 257 to other vegetables.

SMALL FRUITS.

The total area devoted to the cultivation of small fruits in 1899 was 3,092 acres, distributed among 13,379 farms. The value of the fruits grown was $339,569, an average of $25.38 per farm. Of the total area, 1,302 acres, or 42.1 per cent, were devoted to strawberries, and 1,115 acres, or 36.1 per cent to raspberries and Logan berries. The quantities of these fruits produced in 1899 were 2,506,020 and 1,252,930 quarts, respectively. The acreage and production of other berries were as follows: Currants, 259 acres and 311,950 quarts; blackberries and dewberries, 162 acres and 192,010 quarts; gooseberries, 112 acres and 128,250 quarts; and other berries, 142 acres and 151,480 quarts.

SUGAR BEETS.

Though begun only in the last decade, the growing of sugar beets is rapidly becoming an important branch of agriculture in Minnesota. In 1899, 624 farmers devoted to this crop an area of 2,114 acres, or an average of 3.4 acres per farm. They obtained and sold from this land 15,959 tons of beets, an average of 7.5 tons per acre, and received therefor $59,826, an average of $95.88 per farm, $28.30 per acre, and $3.75 per ton.

The production of beets was reported by 31 counties, Carver, Sibley, Scott, McLeod, Hennepin, and Goodhue, ranking in the order named, showing 76.8 per cent of the total acreage.

FLORICULTURE.

In 1899 the operators of 110 farms, including 69 commercial florists, raised flowers and foliage plants to the value of $288,055. The florists derived $270,058 from the sale of flowers and plants, and $7,687 from other products. The capital invested in the 69 florists' establishments was $598,759—$271,750, in land; $305,739, in buildings and other improvements; $15,810, in implements; and $5,460 in live stock. The expenditure for labor was $76,075, and for fertilizers, $1,625.

A total of 1,302,440 square feet of land under glass was reported by the operators of 471 farms, including that of the 69 florists, who reported 889,986 square feet of glass surface, covering a land area of about 667,490 square feet.

NURSERIES.

The 43 nurseries in the state reported net products valued at $392,536, of which amount $376,956 was derived from the sale of nursery stock, and $15,580 from other products. The total area of land used was 4,370 acres, making the gross income per acre $89.83. The capital invested was: $278,670, in land; $78,000, in buildings and improvements; $16,700, in implements; and $18,690, in live stock. The expenditures for labor and fertilizers were $54,122 and $1,305, respectively.

LABOR AND FERTILIZERS.

The total expenditure for labor on farms in 1899, including the value of board furnished, was $16,657,820, an average of $108 per farm. The average was highest per acre for the most intensively cultivated farms. The average per farm was $1,259 for nurseries, $1,103 for florists' establishments, $147 for sugar farms, $128 for hay and grain farms, $87 for live-stock farms, $75 for fruit farms, $73 for tobacco farms, $71 for dairy farms, and $52 for vegetable farms. "Managers" expended, on an average, $570; "share tenants," $113; "owners," $96; and "cash tenants," $90. White farmers expended $108 per farm, and colored farmers, $18.

Fertilizers purchased in 1899 cost $251,120, about four times the amount paid in 1889, and an average of $1.63 per farm. The average expenditure was $30 for nurseries, $24 for florists' establishments, $3 for vegetable farms, $2 for fruit farms and for hay and grain farms, and $1 each for dairy farms, sugar farms, and live-stock farms.

INDIAN RESERVATIONS.

The reservations of Minnesota reporting agriculture are Red Lake, White Earth, and Winnibigoshish. Red Lake and White Earth contain good agricultural and grazing land; many of the Indians on these reserves have made fair progress in farming, while some are successful stock raisers. Winnibigoshish has but little cultivable land, only a few small tracts in the timber areas being devoted to the growing of crops.

The reservation Indians of Minnesota, with the exception of a band of Sioux, are the Chippewa (Algonquian), of which there are a number of different bands. The majority have adopted the ways of civilization and are practically self-supporting, the aged and infirm alone receiving aid from the Government. Those bands which have no opportunity to cultivate the soil, subsist on fish, game, wild rice, and berries, of which they are able, also, to sell large quantities. Logging is carried on to a considerable extent in the timbered districts, and large quantities of maple sugar are also made.

RED LAKE RESERVATION.

Red Lake Reservation, comprising an area of 1,250 square miles, is situated in the northwestern part of the state, in Red Lake and Beltrami counties. The land is a rich prairie with occasional groves of timber, and is well adapted to agriculture; an abundant growth of blue joint grass and a plentiful supply of water provide unexcelled opportunities for stock raising.

The Chippewa at Red Lake are the Red Lake and Pembina bands, the total population of the reserve being 1,450. They have made considerable progress in agriculture in the past few years and where formerly they raised only small quantities of corn and potatoes for local consumption, they now supply the demand for grain, hay, and vegetables, which has been created by the establishment of the lumber industry in the vicinity of the reservation. As a result of this stimulus, the acreage under cultivation has been greatly increased. A number of Indian farmers are engaged also in making maple sugar, some individual reports for the census year ranging as high as 800 pounds.

Most of the 138 Indian farmers reporting, cultivate from 3 to 10 acres of corn, oats, potatoes, beans, and miscellaneous garden vegetables, while a few cut large quantities of wild hay from much larger areas. The best farms lie along the Red Lake River and many more of the tribe could be induced to engage in farming there, if implements and lumber for building purposes were provided.

Stock raising could be made a much more profitable adjunct to their present agricultural operations if cattle were issued to them; a few now possess small numbers including dairy cows, but there is only one large-sized herd on

the reservation. Most farmers own a few work horses of Indian pony stock, and a number also raise swine and chickens.

WHITE EARTH RESERVATION.

White Earth Reservation, embracing an area of 1,099.25 square miles, is situated in the northwestern part of Minnesota, in Norman, Beltrami, and Becker counties. The western portion of the reserve is a large rolling prairie, with a deep, rich soil which is very productive; there is an abundance of wild meadow land, well watered by lakes and running streams. The eastern portion is principally timber land.

The Chippewa (Algonquian) on this reservation number 3,486 and comprise the Chippewa of the Mississippi, Gull Lake, Pembina, Otter Tail, and Pillager bands; they are a peaceable, industrious, and practically self-supporting people, agriculture being their principal occupation. The number and acreage of their farms have increased steadily each year. The best farms are owned by the mixed bloods, many of whom are practically civilized, while the full bloods cultivate only small areas, depending principally upon game, fish, wild rice, and berries, for their subsistence. The latter gather and sell large quantities of snake root, cranberries, etc., and in addition make quantities of maple sugar.

Of the 198 farms on the reserve, 131 were operated by Indians, those of the mixed bloods ranging from 75 to 355 acres in size and those of the full bloods from 5 to 30 acres. The principal crops are wheat, oats, and flax, while potatoes and garden vegetables are grown in small quantities; in addition, considerable quantities of wild prairie grass are cut for hay. Hail storms destroyed a portion of the cereal crop in 1899.

Stock raising is not carried on extensively, although a few farmers have large herds and report considerable sales of live stock. The Indians generally possess a good grade of horses, many raise swine, and a few keep dairy cows and chickens.

WINNIBIGOSHISH RESERVATION.

The Winnibigoshish reserve is located in the north central part of the state in Itasca county, and contains an area of 198 square miles, of which only 22 square miles have been allotted, although the remainder will eventually be opened to settlement. The land is generally unsuited to agriculture, a large portion of it bordering on the lake of the same name, and being valuable principally for the timber upon it.

The Winnibigoshish Chippewa, like their neighbors, the Leech Lake and Cass Lake bands, do little farming, although they raise small quantities of potatoes and other vegetables in the cleared areas among the timber. Only 1 of the 6 farms reported on the reservation was operated by an Indian, but the members of the band practically support themselves by working in logging camps, gathering berries for market, and making maple sugar.

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 171. WASHINGTON, D. C. May 20, 1902.

MANUFACTURES.

RUBBER BOOTS AND SHOES.

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

SIR: I transmit herewith, for publication in bulletin form, a report on the manufacture of rubber boots and shoes during the census year ending May 31, 1900, prepared under my direction by Mr. Harry E. Barbour, of the Census Office.

The statistics included in this report were collected, as at previous censuses, upon the schedule used for the general statistics of manufactures. But owing to the comparative importance of the industry it was decided to supplement the canvass made by the enumerators and local special agents, and to give to this industry a more detailed treatment than is given to manufacturing industries in general, or than this industry has received at previous censuses. Accordingly, supplemental schedules covering more fully certain important features, peculiar to the industry, were sent direct to the different establishments. It will be seen from the accompanying tables that this branch of manufacturing has developed steadily, showing, during each decade, a marked increase in the number of establishments, the amount of capital invested, the number of persons employed, and the value of the products.

The statistics are presented in 11 tables: Table 1 showing comparative figures for the industry at the Tenth, Eleventh, and Twelfth censuses; Table 2 showing, by states, the number of establishments in operation in 1890 and in 1900; Table 3 showing a comparative summary of the statistics of capital for 1890 and 1900; Table 4 showing statistics of miscellaneous expenses for 1900; Table 5 showing the cost of the materials used in 1900; Table 6 showing the quantity and value of the crude rubber imported during the fiscal year ending June 30, 1900, as published in the Report on Commerce and Navigation for that year; Table 7 showing the quantity, value, and source of the crude rubber used in the manufacture of boots and shoes during the census year; Table 8 showing the quantity and value of the products in 1900 by states, and according to the principal varieties of goods manufactured; Table 9 showing the statistics for establishments engaged in the manufacture of wool and felt boots in 1900; Table 10 showing the quantity and value of the rubber boot and shoe exports for 1890 and 1900, and the countries to which they were exported; and Table 11 showing, by states, the detailed statistics for the industry in 1900.

Table 1 shows the growth of the industry during the twenty years which terminate with the Twelfth Censu Owing to changes in the method of taking the censu comparisons between the earlier and later decades, rep resented in Table 1, should be drawn only in the most general way. Nevertheless, the rate of growth in the manufacture of rubber boots and shoes may be fairly inferred from the figures given.

In drafting the schedules of inquiry for the census of 1900 care was taken to preserve the basis of comparison

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

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

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

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

The reports show a capital of $33,667,533 invested in the manufacture of rubber boots and shoes in the 22 establishments reporting for the United States. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the manufacturing corporations engaged in this industry. The value of the products is returned at $41,089,819, to produce which involved an outlay of $597,239 for salaries of officials, clerks, etc.; $6,426,579 for wages; $2,089,154 for miscellaneous expenses, including rent, taxes, etc.; and $22,682,543 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the rubber boot and shoe industry during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value as obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

Very respectfully,

Chief Statistician for Manufactures.

RUBBER BOOTS AND SHOES.

By Harry E. Barbour.

Although the rubber boot and shoe industry was successfully established in this country prior to 1850, it was not reported as a separate industry until the census of 1880. At previous censuses it was reported together with rubber coats, druggists' supplies, and various other rubber sundries, under the general captions of india-rubber and elastic goods, and india-rubber goods. The growth and development of the industry during the past two decades has been constant, and in many respects remarkable, as is shown by the statistics presented in the following tables. Table 1 is a comparative summary of the returns for this industry from 1880 to 1900, inclusive.

TABLE 1.—COMPARATIVE SUMMARY, 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	22	11	9	100.0	22.2
Capital	$33,667,533	$17,790,970	$2,425,000	89.2	633.6
Salaried officials, clerks, etc., number	483	[1] 130	[2]	271.5	.....
Salaries	$597,239	[1] $153,802	[2]	288.3	.....
Wage-earners, average number	14,391	9,134	4,662	57.6	95.9
Total wages	$6,426,579	$3,813,073	$1,469,038	68.5	159.6
Men, 16 years and over	8,248	5,126	2,514	60.9	103.9
Wages	$4,338,480	$2,524,209	[2]	71.9	.....
Women, 16 years and over	5,942	3,924	1,984	51.4	97.8
Wages	$2,052,462	$1,273,580	[2]	61.2	.....
Children, under 16 years	201	84	164	139.3	[3] 48.8
Wages	$35,637	$15,284	[2]	133.2	.....
Miscellaneous expenses	$2,089,154	$943,918	[4]	121.3	.....
Cost of materials used	$22,682,543	$11,650,787	$6,023,053	94.7	93.4
Value of products, including custom work and repairing	$41,089,819	$18,632,060	$9,705,724	120.5	92.0

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

Table 1 shows that from 1880 to 1900 the number of establishments increased from 9 to 22; the capital, from $2,425,000 to $33,667,533; wage-earners, from 4,662 to 14,391; wages, from $1,469,038 to $6,426,579; cost of materials, from $6,023,053 to $22,682,543; and the value of products, from $9,705,724 to $41,089,819. In 1880 there were 9 establishments engaged in this industry, having a capital of $2,425,000; in 1890, 11 establishments, having a capital of $17,790,970; and in 1900, 22 establishments, having a capital of $33,667,533.

The apparently abnormal increase in capital from $2,425,000 in 1880 to $17,790,970 in 1890, or 633.6 per cent, is probably due in part to the fact that a return of live capital was first called for at the census of 1890. As will be seen from Table 3, this item amounted in 1890 to 80.2 per cent of the total capital. If the total capital of 1880 be compared with that of 1890, less this new item of live capital, the per cent of increase will be found to be 45—a figure which may perhaps be regarded as fairly representative of the growth of capital in the industry during that decade. Since the value of products rose in the same period from $9,705,724 to $18,632,060, or 92 per cent, while the number of establishments increased only from 9 to 11, or 22.2 per cent, it is clear that the progress of the decade was chiefly in the development and increased business of established companies rather than in the inception of new enterprises.

Bearing in mind this difference in returns of capital for 1880 and 1890, we find that in every item (except wage-earners and wages, which are not comparable) the industry has made during the last ten years a greater progress than in the previous decade. In value of products the gain was 120.5 per cent against 92 per cent from 1880 to 1890; in number of establishments, 100 per cent against 22.2; and in capital, 89.2 per cent. The average capital per establishment was slightly smaller in 1900 than it was in 1890. In 1880 there were 4,662 wage-earners, an average of 518 for each establishment; in 1890 the number of wage-earners had increased to 9,134, or 95.9 per cent, an average of 830; and in 1900 there were 14,391 wage-earners, an increase of 57.6 per cent over 1890, and an average of 654 for each establishment. In 1880 the amount of wages paid was $1,469,038; in 1890 it was $3,813,073, showing an increase of 159.6 per cent; and in 1900 it was $6,426,579, showing an increase of 68.5 per cent over 1890. No separate report was made of miscellaneous expenses in 1880; in 1890 this item amounted to $943,918; in 1900 it amounted to $2,089,154, showing an increase of 121.3 per cent. In 1880 the cost of materials was $6,023,053; in 1890 it was $11,650,787,

showing an increase of $5,627,734, or 93.4 per cent; and in 1900 the cost of materials used was reported at $22,682,543, an increase of $11,031,756, or 94.7 per cent over 1900. In 1880 the industry showed products valued at $9,705,724; in 1890 the value of the products was $18,632,060, an increase of $8,926,336, or 92 per cent. In 1900 the value of the products was $41,089,819, an increase over 1890 of $22,457,759, or 120.5 per cent.

The following graphic chart shows the comparative growth of capital, cost of materials, and value of products from 1880 to 1900, the unit of growth being $1,000,000.

Table 2 presents, by states, the number of establishments actively engaged in the manufacture of rubber boots and shoes in 1890 and in 1900.

Comparative increase of capital, materials, and products, 1880 to 1900 inclusive.

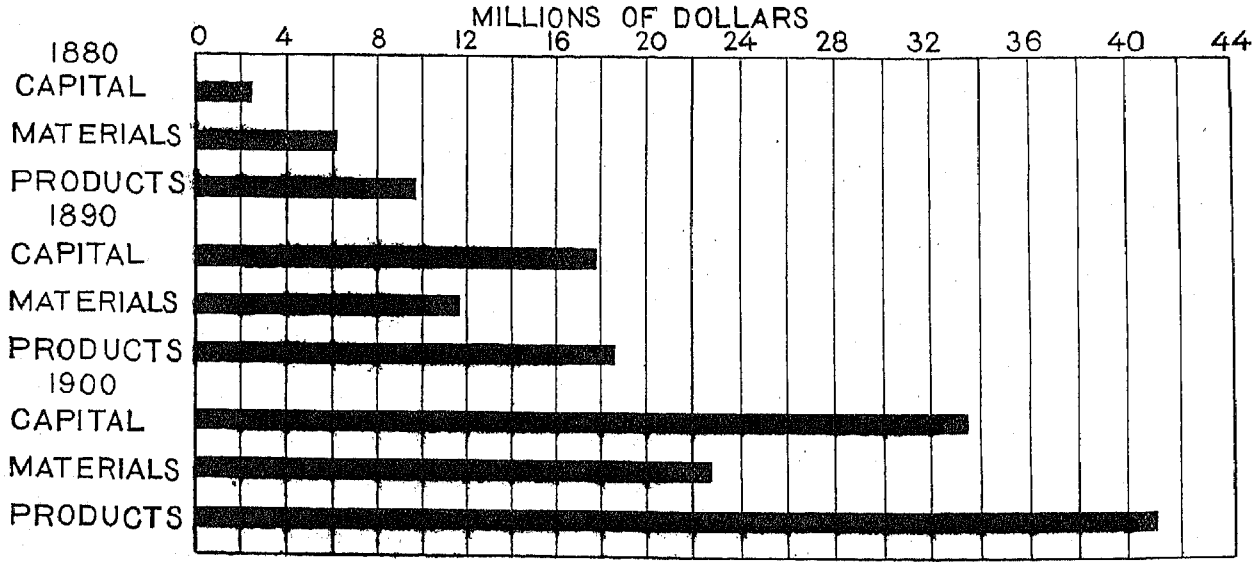


TABLE 2.—COMPARATIVE SUMMARY: NUMBER OF ACTIVE ESTABLISHMENTS, 1890 AND 1900, BY STATES.

STATES.	1900	1890
United States	22	11
Connecticut	5	2
Massachusetts	6	5
Missouri	1	.....
New Jersey	2	2
Pennsylvania	2	1
Rhode Island	6	1

It appears from Table 2 that the number of establishments engaged in this industry increased from 11 to 22, or 100 per cent, during the decade. The greatest increase was shown in Rhode Island which reported 1 establishment in 1890 and 6 in 1900. Connecticut shows an increase of 3, while Massachusetts, Missouri, and Pennsylvania show an increase of 1 each. One plant was established in Massachusetts and 1 in Rhode Island during the census year.

Table 3 is a comparative summary of capital as returned at the censuses of 1890 and 1900, with the per cent each item is of the total, and the per cent of increase for the decade.

TABLE 3.—COMPARATIVE SUMMARY, CAPITAL: 1890 AND 1900.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	$33,667,533	100.0	$17,790,970	100.0	89.2
Land	939,089	2.8	463,615	2.6	102.6
Buildings	3,554,457	10.5	1,664,992	9.4	113.5
Machinery, tools, and implements	3,700,050	11.0	1,386,595	7.8	166.8
Cash and sundries	25,473,937	75.7	14,275,768	80.2	78.4

The principal item reported under the head of capital, both in 1890 and 1900, is that of 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. This item in 1890 amounted to $14,275,768, or 80.2 per cent of the total; and in 1900 it was $25,473,937, an increase of 78.4 per cent, and represented 75.7 per cent of the total capital. In 1890 the value of the land was reported at $463,615, or 2.6 per cent of the total capital; in 1900 it was $939,089, or 2.8 per cent of the total, showing an increase of 102.6 per cent. From 1890 to

1900, the value of the buildings increased from $1,664,992 to $3,554,457, or 113.5 per cent. This item in 1890 represented 9.4 per cent of the total capital, and 10.5 per cent in 1900. The amounts reported for land and buildings represent only such as are owned by the establishments engaged in this industry, and do not include leased property. The greatest proportional increase in any form of capital was in the item of machinery, tools, and implements, indicating the continual extension in the application of machinery to this industry. In 1890 the value of machinery, tools, and implements, was $1,386,595, or 7.8 per cent of the total capital; in 1900 it was $3,700,050, or 11 per cent of the total, showing an increase of 166.8 per cent. Notwithstanding the marked increase in capital during the decade, the amount reported for each item in Table 3 represents very nearly the same per cent of the total, in 1890 and in 1900, indicating a steady and uniform growth for the period. In addition to the capital for active establishments, shown in Table 3, there was a capital of $105,000 reported for 1 idle establishment, located in New Jersey.

Table 4 shows in detail the statistics of miscellaneous expenses for 1900.

TABLE 4.—MISCELLANEOUS EXPENSES: 1900.

	1900	
	Amount.	Per cent of total.
Total	$2,089,154	100.0
Rent of works	12,800	0.6
Taxes, not including internal revenue	184,892	8.9
Rent of offices, insurance, interest, repairs, advertising, and other sundries	1,891,462	90.5

Table 4 shows that the amount paid for miscellaneous expenses in 1900 was $2,089,154. The total expenditures for rent of works, $12,800, which represents six-tenths of 1 per cent of all miscellaneous expenses, was divided between two establishments. Taxes, not including internal revenue, amounted to $184,892, or 8.9 per cent of the total. The principal item of miscellaneous expenses is that of 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. This item represents $1,891,462, or 90.5 per cent of the total. Interest, included under this head, comprises only such sums as were paid for money or credit during the year. No allowance is made for depreciation in value of buildings or machinery. None of the establishments engaged in this industry report having paid anything for contract work during the year.

Table 5 shows the cost of materials used in the manufacture of rubber boots and shoes, the cost of each item, and its proportion of the whole amount for 1900.

TABLE 5.—COST OF MATERIALS: 1900.

	1900	
	Amount.	Per cent of total.
Total	$22,682,543	100.0
Principal materials	22,223,946	98.0
Purchased in raw state	14,582,768	64.3
Purchased in partially manufactured form	7,641,178	33.7
Fuel	242,619	1.1
Mill supplies	123,869	0.5
Freight	92,109	0.4

Table 5 shows that the total cost of materials for 1900 was $22,682,543. The largest item is that reported for principal materials, or those which actually enter into the product. These are subdivided into materials purchased in a raw state and those purchased in a partially manufactured form. Materials purchased in the raw state are those upon which no manufacturing force has been expended, and consist chiefly of crude rubber. The cost of this class of materials was $14,582,768, or 64.3 per cent of the total. Materials purchased in a partially manufactured form cost $7,641,178, or 33.7 per cent of the total. This item includes reclaimed rubber, felt goods, chemicals, sheeting, and other necessary materials. It is impossible to estimate the exact quantity or value of reclaimed rubber used in 1900; many establishments included this item with the cost of all other materials, yet the fact that 5 establishments reported having used 2,971,806 pounds of reclaimed rubber, valued at $337,371, shows it to be an important factor in this industry. Some establishments were unable to separate the amount paid for freight from the cost of materials, and reported the two together. For that reason the $92,109 shown in Table 5 does not represent the actual cost of freight, and should be considered only in connection with the cost of materials. The amount paid for fuel, $242,619, comprises that used for both motive power and heating purposes. Each establishment engaged in this industry produced its own power and heat. Mill supplies, including oil, waste, belting, tools, etc.—materials which do not enter into the product, but are necessary in the process of manufacture—cost $123,869. The three items of fuel, mill supplies, and freight, together form but a small per cent of the total.

Table 6 is an extract from the report on commerce and navigation issued by the United States Treasury Department, showing the entire amount of crude rubber imported into this country during the fiscal year ending June 30, 1900, and the countries from which it was exported.

TABLE 6.—QUANTITY AND VALUE OF TOTAL IMPORTS OF CRUDE RUBBER FOR THE FISCAL YEAR ENDING JUNE 30, 1900.

COUNTRIES FROM WHICH IMPORTED.	Pounds.	Value.
Total	49,377,138	$31,376,867
Europe	16,998,907	11,231,915
Belgium	2,844,404	2,243,964
France	1,198,209	745,592
Germany	1,750,498	892,246
Netherlands	106,621	68,122
Portugal	2,488,114	1,719,311
United Kingdom	8,611,061	5,562,680
North America	1,922,179	1,028,504
British Honduras	51,295	23,852
Dominion of Canada	586	440
Newfoundland and Labrador	9,171	5,997
Central American states:		
Costa Rica	134,789	78,870
Guatemala	204,546	74,596
Honduras	176,731	83,184
Nicaragua	827,087	523,131
Salvador	54,971	18,909
Mexico	450,712	214,886
West Indies:		
British	11,964	4,443
Cuba	327	196
South America	29,811,978	18,831,082
Brazil	28,026,714	17,876,121
Chile	15,136	10,394
Colombia	815,091	439,632
Ecuador	826,411	421,283
Guiana, Dutch	215	118
Peru	8,211	5,345
Uruguay	785	480
Venezuela	119,415	77,709
Asia	644,074	285,366
Chinese Empire	2,168	828
East Indies, British	640,483	284,155
Hongkong	1,428	383

During the year ending June 30, 1900, the total amount of crude rubber imported into the United States was 49,377,138 pounds, valued at $31,376,867. Of this amount 29,811,978 pounds, valued at $18,831,082, were shipped from South America; 16,998,907 pounds, valued at $11,231,915, from Europe; 1,922,179 pounds, valued at $1,028,504, from North America; and 644,074 pounds, valued at $285,366, from Asia. Of the total amount imported, 28,026,714 pounds, valued at $17,876,121, or more than half, was received from Brazil, the chief rubber-producing country, shipments being made directly from Brazilian to American seaports. In the quantity of rubber furnished, Brazil is followed by the United Kingdom, Belgium, Portugal, Germany, and France, in the order named. From these six countries were received about nine-tenths of the importation of crude rubber for the year.

Table 6 is not intended to show the source of the crude rubber used in this country, but rather the quantity received. Large amounts were shipped from non-producing countries, while none whatever came from Africa to the United States direct. Table 7 shows that 4,917,281 pounds of African rubber, costing $3,624,442, were used in the manufacture of rubber boots and shoes. This rubber reached the United States by way of other countries. The entire importation of crude rubber for the year, shown in Table 6, should be considered in connection with Table 7, which shows the quantity, value, and source of that used in the manufacture of rubber boots and shoes.

TABLE 7.—QUANTITY AND VALUE OF THE IMPORTS OF CRUDE RUBBER USED IN THE MANUFACTURE OF RUBBER BOOTS AND SHOES: 1900.

COUNTRIES FROM WHICH IMPORTED.	Pounds.	Value.
Total	17,684,657	$14,582,768
Brazil	10,891,367	9,638,992
Africa	4,917,281	3,624,442
Central America	1,858,473	1,304,754
Asia	17,536	14,580

Table 7 shows that in 1900 there were consumed in this industry 17,684,657 pounds of crude rubber, valued at $14,582,768. A comparison of these figures with those of Table 6 shows that 35.8 per cent of the total quantity and 46.5 per cent of the total value of crude rubber imported during the year was used in the manufacture of rubber boots and shoes. Of the amount so used, 10,891,367 pounds, valued at $9,638,992, came from Brazil; 4,917,281 pounds, valued at $3,624,442, from Africa; 1,858,473 pounds, valued at $1,304,754, from Central America; and 17,536 pounds, valued at $14,580, from Asiatic countries.

Table 8 is a detailed statement, by states, of the number of pairs and the value of the different varieties of rubber boots and shoes manufactured during the census year.

The aggregate value of the products of this industry during the census year was $41,089,819. There were produced 49,979,229 pairs of rubber boots and shoes of all kinds, or more than one pair for every two persons in the United States, the value of the output, including men's, women's, and children's, being $38,761,320. For those states which reported 3 or more establishments, the product is shown separately, while, to avoid disclosing the operations of individual establishments, the product of those states reporting less than 3 is shown collectively under the head of "all others." Massachusetts, with 6 establishments, reported products valued at $16,490,015, or 40.1 per cent of the aggregate; Connecticut, with 5 establishments, reported products valued at $11,999,038, or 29.2 per cent; Rhode Island, with 6 establishments, reported products valued at $8,034,417, or 19.6 per cent; and the 5 establishments located in Missouri, New Jersey, and Pennsylvania manufactured $4,566,349 worth of products, or 11.1 per cent of the aggregate for the industry. By means of the supplemental reports furnished by the different establishments, it is possible to itemize the products, showing the quantity and value of each of the principal kinds of goods manufactured. In Table 8 the product is divided into men's, women's, and children's wear, and these groups are again subdivided into rubber boots, rubber shoes, rubber tennis shoes, arctic overs, lumbermen's overs, felt boots, and other varieties, the last-named subdivision including boots and shoes which can not be classified under any of the preceding headings. The item, "all other products," comprises the products for which

TABLE 8.—NUMBER OF PAIRS AND VALUE OF DIFFERENT KINDS OF RUBBER BOOTS AND SHOES: 1900.

	United States.	Massachusetts.	Connecticut.	Rhode Island.	All other states.[1]
Aggregate value	$41,089,819	$16,490,015	$11,999,088	$8,034,417	$4,566,349
Boots and shoes, rubber:					
Total number of pairs	49,979,229	19,750,961	15,375,035	10,090,357	4,762,876
Total value	$38,761,320	$15,778,558	$11,518,072	$7,051,812	$4,422,883
Men's—					
Total number of pairs	24,686,643	9,287,815	7,689,297	5,248,239	2,461,292
Total value	$27,160,177	$11,195,770	$7,921,802	$4,593,846	$3,448,759
Rubber boots—					
Number of pairs	3,512,421	2,082,541	770,569	198,619	460,692
Value	$10,572,214	$6,465,974	$2,400,637	$460,432	$1,245,171
Rubber shoes—					
Number of pairs	10,651,684	3,751,082	3,983,525	2,137,672	779,405
Value	$5,518,515	$1,674,087	$2,163,097	$1,185,504	$495,827
Rubber tennis shoes—					
Number of pairs	1,424,448	623,426	30,000	748,728	22,294
Value	$634,041	$336,277	$20,000	$268,888	$8,876
Arctic overs—					
Number of pairs	4,672,862	1,690,052	969,005	1,556,321	457,484
Value	$4,815,075	$1,602,018	$922,668	$1,795,733	$494,661
Lumbermen's overs—					
Number of pairs	4,229,899	996,962	1,936,198	558,766	737,973
Value	$5,488,166	$1,081,158	$2,415,400	$842,550	$1,199,058
Felt boots—					
Number of pairs	147,196	143,752	.....	.....	3,444
Value	$91,427	$86,261	.....	.....	$5,166
Other varieties—					
Number of pairs	48,133	.....	.....	48,133	.....
Value	$40,739	.....	.....	$40,739	.....
Women's—					
Total number of pairs	18,847,355	8,105,873	6,247,549	2,964,976	1,528,957
Total value	$8,165,695	$3,042,142	$2,969,100	$1,504,691	$649,762
Rubber boots—					
Number of pairs	303,622	159,174	86,485	29,246	28,717
Value	$464,264	$219,680	$153,055	$50,072	$41,457
Rubber shoes—					
Number of pairs	16,113,746	7,102,051	5,579,019	2,086,385	1,346,291
Value	$6,925,474	$2,281,765	$2,360,254	$842,211	$491,244
Rubber tennis shoes—					
Number of pairs	346,744	220,807	21,456	99,661	4,820
Value	$185,199	$129,357	$15,044	$38,987	$1,811
Arctic overs—					
Number of pairs	2,003,286	623,841	551,330	678,986	149,129
Value	$1,535,902	$461,340	$431,488	$527,884	$115,250
Lumbermen's overs—					
Number of pairs	9,259	.....	9,259	.....	.....
Value	$9,259	.....	$9,259	.....	.....
Other varieties—					
Number of pairs	70,698	.....	.....	70,698	.....
Value	$45,537	.....	.....	$45,537	.....
Children's—					
Total number of pairs	6,445,281	2,357,273	1,438,189	1,677,142	772,627
Total value	$3,435,448	$1,535,641	$622,170	$953,275	$324,362
Rubber boots—					
Number of pairs	623,009	444,889	84,545	33,641	59,934
Value	$1,123,060	$906,406	$99,327	$45,795	$71,532
Rubber shoes—					
Number of pairs	4,135,463	1,433,434	1,186,167	1,010,151	505,711
Value	$1,299,182	$342,197	$425,176	$381,025	$150,784
Rubber tennis shoes—					
Number of pairs	558,089	206,726	20,000	298,224	33,139
Value	$249,484	$123,541	$12,000	$101,993	$11,950
Arctic overs—					
Number of pairs	971,613	224,296	138,850	492,297	116,170
Value	$634,710	$185,437	$82,827	$371,974	$44,472
Lumbermen's overs—					
Number of pairs	145,418	47,928	8,627	31,602	57,261
Value	$122,176	$28,060	$2,840	$46,260	$45,016
Felt boots—					
Number of pairs	412	.....	.....	.....	412
Value	$608	.....	.....	.....	$608
Other varieties—					
Number of pairs	11,227	.....	.....	11,227	.....
Value	$6,228	.....	.....	$6,228	.....
All other products, including custom work and repairing	$2,328,499	$716,462	$485,966	$982,605	$143,466

[1] Includes establishments located in Missouri, New Jersey, and Pennsylvania.

separate quantities and values have not been given, by-products, and custom work and repairing. The value of men's wear was reported at $27,160,177, or 66.1 per cent of the aggregate product of the industry; women's at $8,165,695, or 19.9 per cent; children's at $3,435,448, or 8.3 per cent; and all other varieties, including custom work and repairing, at $2,328,499, or 5.7 per cent of the aggregate product.

As wool and felt boots enter in considerable quantities into some of the finished products of the rubber boot and shoe industry, there is given in Table 9 a summary showing the statistics for this industry as carried on in 1900 by establishments separate and distinct from those engaged in the manufacture of rubber boots and shoes.

TABLE 9.—SUMMARY OF THE MANUFACTURE OF WOOL AND FELT BOOTS: 1900.

Number of establishments	5
Capital	$2,361,871
Salaried officials, clerks, etc., number	82
Salaries	$134,149
Wage-earners, average number	1,400
Total wages	$649,666
Men, 16 years and over	1,087
Wages	$561,128
Women, 16 years and over	309
Wages	$88,062
Children, under 16 years	4
Wages	$481
Miscellaneous expenses	$122,550
Cost of materials used	$1,548,408
Value of products, including custom work and repairing	$2,742,745

Table 9 shows that there were 5 establishments engaged in the wool and felt boot industry in 1900, with a total capital of $2,361,871. The industry gave employment to 1,400 wage-earners, with total wages amounting to $649,666, and the value of the products was $2,742,745.

Table 10 is a comparative statement of the exports of rubber boots and shoes for 1890 and 1900, giving the number of pairs, their value, and the countries to which they were exported, as shown in the reports of the Bureau of Statistics of the United States Treasury Department.

TABLE 10.—EXPORTS OF RUBBER BOOTS AND SHOES: 1890 AND 1900.

COUNTRIES TO WHICH EXPORTED.	1900		1890	
	Pairs.	Value.	Pairs.	Value.
Aggregate	767,104	$420,746	171,473	$149,055
Europe	647,189	301,040	66,516	43,825
Austria-Hungary	4,322	2,099	75	38
Azores and Madeira Islands	48	120	129	539
Belgium	9,753	4,880	5,139	2,344
Denmark	6,484	4,364	4,799	1,930
France	153,865	54,680	1,161	692
Germany	141,266	55,946	2,544	1,419
Italy	235	170	15	11
Netherlands	318	145	3,111	1,341
Portugal			81	29
Spain	13,519	6,442		
Sweden and Norway	884	414	100	50
Switzerland	3,810	1,132		
Turkey	7,006	3,844		
United Kingdom	305,679	166,804	49,412	34,932
North America	49,798	53,326	85,777	79,879
British Honduras	24	9		
British North America:				
Dominion of Canada—				
Nova Scotia, New Brunswick	18,880	19,996	14,841	10,776
Quebec, Ontario, Manitoba	8,661	4,562	37,921	32,489
British Columbia	5,764	15,146	20,494	27,216
Newfoundland and Labrador	4,985	4,087	4,024	3,393
Central American states:				
Costa Rica	36	17		
Guatemala	146	80	684	561
Honduras	15	15	24	11
Nicaragua	288	193	108	203
Mexico	1,894	1,043	3,931	1,779
Miquelon, Langley, etc	2,953	4,021	1,700	1,691
West Indies:				
British	90	111	422	504
Cuba	5,749	3,793	58	98
Danish	15	11	172	132
Dutch			132	101
French	4	12		
Haiti	38	24	625	619
Porto Rico	282	198	198	125
Santo Domingo	24	8	448	181
South America	9,492	6,852	5,801	2,792
Argentina	1,534	1,501	334	237
Brazil	3,016	2,874	326	467
Chile	264	672		
Colombia	3,932	1,442	3,142	1,274
Ecuador	168	79	144	60
Peru	290	177	224	141
Uruguay	288	107		
Venezuela			1,631	613
Asia	22,654	17,662	6,571	8,509
Chinese Empire	428	741	504	725
East Indies, British	153	85		
Hongkong	708	1,145	75	172
Japan	21,285	15,630	5,992	7,612
Turkey in Asia	80	61		
Oceania	36,689	40,635	6,806	14,546
British Australasia	34,513	35,769	5,416	11,225
French Oceania	14	30	88	214
Hawaii	2,070	4,631	1,307	3,107
Philippine Islands	92	205		
Africa	1,282	1,231	2	4
British Africa	1,258	1,159		
French Africa	24	72		
Liberia			2	4

Table 10 shows the development, during the past decade, of the export trade in rubber boots and shoes. In 1890 there were exported 171,473 pairs, valued at $149,055; in 1900 the total exports had increased to 767,104 pairs, valued at $420,746. Nearly half of the exports in 1890 were sent to Canada, while 49,412 pairs, valued at $34,932, went to the United Kingdom. The exports to other countries ranged in number and value from 5,416 pairs, valued at $11,225, exported to British Australasia, to the 2 pairs, valued at $4, which were sent to Liberia. The greatest increases have been in our exports to the United Kingdom, France, Germany, and other leading manufacturing countries. In 1900 our exports to the United Kingdom amounted to 305,679 pairs, valued at $166,804. France, which received but 1,161 pairs, invoiced at $692, in 1890, purchased 153,865 pairs, valued at $54,680, in 1900. During the ten years the exports to Germany increased from 2,544 pairs, valued at $1,419, to 141,266 pairs, valued at $55,946. Notable increases were made in the exports to British Australasia, Japan, Brazil, Cuba, Denmark, Belgium, and Austria-Hungary; while Spain, Switzerland, Turkey, Chile, Uruguay, the Philippine Islands, British Africa, and several minor countries, to which no exports were sent in 1890, received in 1900 a total of 26,558 pairs, valued at $13,817. Between 1890 and 1900 there were decreases in the exports to the Netherlands, Dominion of Canada, Mexico, Venezuela, and several smaller countries. The most notable decrease is found in the exports to the Dominion of Canada, which in 1900 amounted to 33,305 pairs, valued at $39,704, compared with 73,256 pairs, valued at $70,481, in 1890. While the rubber boot and shoe exports represented but a little more than 1 per cent of the product in 1900, they are increasing in value and have made their way into almost every part of the globe.

HISTORICAL AND DESCRIPTIVE.

The manufacture of boots and shoes is one of the oldest industries in America. There were many shoemakers among the early settlers in this country, and in an old document bearing date of 1629 it is found recorded that Thomas Beard, with "hides, both upper and bottom, was shipped out" on the *Mayflower*. But it was not until almost the middle of the last century that the manufacture of boots and shoes from rubber—the product of caoutchouc gum—was carried on with any degree of success in this or any other country. So closely is the early history of the manufacture of rubber boots and shoes associated with that of the rubber industry in general that a brief synopsis of the latter will truly describe the conditions of the former.

Crude rubber is prepared from the milky sap, or latex, of rubber-yielding plants, the habitat of which is limited to the regions between the thirtieth degree north and the thirtieth degree south latitude. Some botanists claim that all plants having a milky juice or sap contain rubber; and there is authority for the statement that the juice of the milkweed, so common in the

United States and Canada, contains 4 per cent of rubber. But even if this is true, rubber is not found in quantities sufficient to make the gathering of it profitable, except in tropical and semitropical regions. There are several different families and species of rubber-yielding plants, and the climatic conditions in which they thrive vary from the moist region of the Amazon to the hot, dry, granite rocks of Ceara. While rubber is produced in South America, Central America, Africa, Asia, and many tropical islands, the best quality is that known as Para rubber, which derives its name from the seaport whence it is exported. This is abundantly produced in the moist, warm regions of the Amazon River, where the annual rainfall is about 7 feet and inundations are frequent. Authorities are divided as to the species of rubber-yielding tree which produces the best quality of rubber, some claiming that it is the Hevea guyanensis (also called Siphonia elastica), while others designate Hevia braziliensis (also called Siphonia braziliensis) as the actual rubber tree. The milky sap of the rubber plant is obtained by either tapping or felling the tree, and the juice, when collected, is prepared for export in various ways. The best and most practical way of preparing the rubber for market is that used in the preparation of Para rubber and has much to do with its superior quality. This is known as the process of fumigation. A fire of brushwood or palm nuts is kindled, and over it is placed a clay funnel. The Seringueiro, or rubber gatherer, dips a paddle-shaped stick into his gourd of milky sap, then holds it in the dense smoke issuing from the funnel until the latex acquires sufficient density. This process is repeated, adding layer after layer, until the mass on the end of the paddle reaches the desired thickness, when it is slit up, and after drying in the open air is ready for market. By this process a good workman can cure five or six pounds of rubber in an hour.[1]

The first importations of rubber into the United States did not come as articles of commerce, but were brought here by sailors as a curious product of tropical lands. No particular commercial value was placed upon "gum elastic," as it was called, and it could readily be purchased at 5 cents a pound. In the year 1823 a Boston sea captain, returning from a tropical voyage, brought with him a pair of gilded rubber shoes, which, though heavy and awkward, aroused general interest because of their imperviousness to water. A few years later several hundred pairs of these rubber shoes, without the gilding, were brought into this country and readily sold at prices ranging from $3 to $5 per pair. The low cost of crude rubber and its relatively high value when made into shoes soon suggested to enterprising minds that considerable profit could be realized from the manufacture and sale of rubber goods, and both in the United States and Europe attention was given to the study and development of this product of the Tropics. In 1831 Mr. Chaffee, a manufacturer of leather goods in Roxbury, Mass., discovered that crude rubber dissolved in spirits of turpentine and combined with a quantity of lampblack would produce a varnish which would give to leather or cloth a surface smooth, hard, and impervious to water, and in 1833 the Roxbury India Rubber Company was organized to place this discovery upon the market. This is said to have been the pioneer company in the American rubber trade. The manufacture of rubber goods offered so broad a field for development that others followed the lead of the Roxbury company. Several millions of dollars were invested in this new industry, and a large and profitable business seemed assured. But the rubber problem had not been solved. Hardly had the product of these factories been placed upon the market when it was discovered that for practical purposes it was almost useless. In warm weather the rubber melted and became sticky, and when exposed to cold it became brittle and cracked. The demand for rubber goods ceased, and large quantities which were on the market were returned to the manufacturers. Efforts to remedy this fault having proved unsuccessful, the factories were closed, and in 1835 the rubber industry was in a state of absolute collapse.[2]

Experiments were being carried on, however, simultaneously in the United States and in Europe, which were leading toward the correct solution of the rubber problem. In 1832 Luedersdorf, a German chemist, discovered that sulphur would deprive rubber dissolved in oil of turpentine of its stickiness. About the same time Nathaniel Hayward noticed that flowers of sulphur scattered upon leaves of rubber weakened their adhesive power. No further development of this process seems to have been made by either Luedersdorf or Hayward, and it remained for Charles Goodyear to discover the method by which rubber could be put to practical use. To those who are interested in the manufacture of rubber the story of Goodyear's discovery of the process of vulcanization is familiar. While surrounded by a small group of friends and neighbors to whom he was explaining his theories, based on the discovery of Hayward, he accidentally overturned a small quantity of rubber and sulphur upon a hot stove. It was by this accident that the remarkable discovery was made that heat was the one thing needed to make rubber insensible to both heat and cold. With the key to the solution of the problem thus exposed the process of vulcanization was rapidly developed. Goodyear's original method consisted in combining rubber with melted sulphur and heating the compound to about 300° F. A product similar to Goodyear's was shortly afterwards prepared by Hancock, by immersing rubber in melted sulphur heated to about 302° F., and allowing it to remain until thoroughly permeated. Alexander Parkes, of Birmingham,

[1] India Rubber, Gutta-percha, and Balata; William T. Brannt, pages 7–37.

[2] One Hundred Years of American Commerce; American Rubber Manufactures, by Charles L. Johnson, Vol. II, pages 498–500.

discovered the process of "cold vulcanization," which is accomplished by means of chloride of sulphur; and Gerard has demonstrated that small, thin articles can be vulcanized by the use of alkaline sulphur. But of all methods of treating rubber the most important and the one in most general use is that invented by Goodyear, which consists in mechanically mixing rubber and sulphur at a moderate temperature and subsequently curing the mixture by the use of superheated steam at a temperature ranging from 248° to 302° F.[1] Color, softness, and other properties are given to rubber by the use of litharge, white lead, chalk, lampblack, and other materials.

Vulcanized rubber possesses the following properties: It retains its elasticity at a temperature as high as 248° F. and as low as —22° F.;[2] it can not be dissolved by ordinary solvents; it acquires extraordinary powers of resisting compression, with a great increase of strength and elasticity. Thus, by the process of vulcanization, the almost useless "gum elastic" has been transformed into a useful article of commerce, and the field for further development seems almost unlimited.

When crude rubber is imported into this country it must first of all be purified. The impurities either originate in the rubber itself or consist of pieces of bark, dirt, stones, or other substances which become mixed with the mass in course of preparation. In cleansing the rubber, it is first softened by immersion in water heated by steam, where it is allowed to remain from three to twenty-four hours. The lump is then cut into slices, either by machine or by hand, and the larger impurities removed. The next step is that of rolling and washing, accomplished by passing the rubber between two massive iron rolls—usually corrugated—directly over the point of contact of which is an iron water pipe. The rubber is fed into this machine, ground and crushed by the rolls, while the water from the pipe directly above permeates the mass and washes away the small particles of bark, fiber, and other foreign substances. After the rubber has been repeatedly passed through these rolls it is placed in drying chambers, where it remains until entirely free from moisture, when it is stored away, in rooms protected from light and dampness, until needed for further working.[3]

In the manufacture of boots and shoes the cleansed rubber is first ground and masticated. It then undergoes the compounding process, by which it is mixed with the various ingredients, chiefly sulphur and litharge. After that it is rolled and pressed, the whole mass being kneaded into one homogeneous substance. The boots and shoes of the present day are not made of one solid piece of rubber, as were those first brought into this country. The ordinary rubber shoe consists of 7 or 8 different parts, and 23 parts are necessary to make the rubber boot. The rubber which is to form the uppers is coated with a tricotic tissue, by passing through a calender; that which is to make the soles is passed through another calender, from which it comes with the sole pattern marked out; and each of the other parts is prepared by being passed through the proper calender. From the sheets so formed the pieces are cut out, usually by hand, and cemented together over a smooth last. They are then varnished with asphalt lacquer and revulcanized for seven or eight hours at a temperature of 260° F. The product is then ready for the market. Another important feature of the industry is the process by which waste rubber is reclaimed and again used in manufacturing. This waste, which consists of old rubber boots, shoes, belting, and innumerable other rubber articles, is first run through masticating machines which reduce it to a powder-like mass. It is then passed over magnetic plates, by which all metallic substances are withdrawn, and by another machine the dirt is sifted out. The waste is next boiled in a vat with an acid solution, which destroys the fibrous matter; and, after being washed in large tubs, is thoroughly dried and returned to the mills for refining.[4]

The manufacture of rubber boots and shoes, as it exists in the United States, dates its inception from the granting of the Goodyear patent, in 1844; and from the very beginning to the present time the industry has shown a strong, steady development. This is noticeable not only in the quantity of goods produced but also in the style and quality of the product, which has been constantly improved, until to-day, considering shapes and sizes, fully 1,000 varieties of rubber boots and shoes are produced.[5] One of the greatest improvements has been the lessening of the feeling of tightness and uncomfortable heat caused by the wearing of rubber shoes. In the early days of the industry rubber boots and shoes were classed as luxuries to be enjoyed only by the well-to-do. But with the assistance of new machinery and improved methods the product of this industry is now offered to the public at a price within the reach of all. The rubber shoe has demonstrated its usefulness, and to-day is generally considered a necessity.

Table 11 presents in detail, by states, the statistics for the industry, as returned at the census of 1900.

[1] India Rubber, Gutta-percha, and Balata; William T. Brannt, pages 110–120.

[2] Ibid., page 5.

[3] Ibid., pages 92–99.

[4] Rubber, W. E. Simpson, Wall Street Journal, October, 1900.

[5] One Hundred Years of American Commerce: American Rubber Manufactures, by Charles L. Johnson, Vol. II, page 503.

TABLE 11.—RUBBER BOOTS AND SHOES, BY STATES: 1900.

	United States.	Massachusetts.	Connecticut.	Rhode Island.	All other states.[1]
Number of establishments	22	6	5	6	5
Character of organization:					
Individual	2			1	1
Incorporated company	20	6	5	5	4
Established during the decade	9	2	1	4	2
Established during the census year	2	1		1	
Capital:					
Total	$33,667,533	$13,157,321	$9,530,718	$7,379,867	$3,599,627
Land	$939,089	$377,473	$290,400	$141,027	$130,189
Buildings	$3,554,457	$1,082,003	$856,613	$1,217,428	$398,413
Machinery, tools, and implements	$3,700,050	$898,462	$1,209,461	$976,125	$616,062
Cash and sundries	$25,473,937	$10,799,383	$7,174,304	$5,045,287	$2,454,963
Proprietors and firm members	3			1	2
Salaried officials, clerks, etc.:					
Total number	483	153	107	105	118
Total salaries	$597,239	$220,321	$150,396	$124,955	$101,567
Officers of corporations—					
Number	40	12	12	11	5
Salaries	$167,202	$49,100	$60,750	$43,520	$13,832
General superintendents, managers, clerks, and salesmen:—					
Total number	443	141	95	94	113
Total salaries	$430,037	$171,221	$89,646	$81,435	$87,735
Men—					
Number	357	104	79	73	101
Salaries	$389,427	$156,360	$80,408	$70,702	$81,957
Women—					
Number	86	37	16	21	12
Salaries	$40,610	$14,861	$9,238	$10,733	$5,778
Wage-earners, including pieceworkers, and total wages:					
Greatest number employed at any one time during the year	17,821	6,913	5,041	3,534	2,333
Least number employed at any one time during the year	9,281	3,335	1,485	2,739	1,722
Average number	14,391	5,250	4,217	3,170	1,754
Wages	$6,426,579	$2,456,305	$1,986,023	$1,281,705	$702,546
Men, 16 years and over—					
Average number	8,248	2,921	2,461	1,726	1,140
Wages	$4,338,480	$1,672,136	$1,326,809	$809,414	$530,121
Women, 16 years and over—					
Average number	5,942	2,272	1,739	1,360	571
Wages	$2,052,462	$774,152	$653,826	$460,491	$163,993
Children, under 16 years—					
Average number	201	57	17	84	43
Wages	$35,637	$10,017	$5,388	$11,800	$8,432
Average number of wage-earners, including pieceworkers, employed during each month:					
Men, 16 years and over—					
January	8,406	3,120	2,375	1,688	1,223
February	8,353	2,912	2,546	1,673	1,222
March	6,996	2,626	1,832	1,639	899
April	8,040	2,643	2,450	1,693	1,254
May	8,909	3,363	2,618	1,744	1,184
June	8,756	3,371	2,609	1,701	1,075
July	9,136	3,413	2,793	1,730	1,200
August	8,706	2,989	2,757	1,759	1,201
September	8,331	2,822	2,592	1,773	1,204
October	8,179	2,866	2,553	1,763	997
November	7,995	2,917	2,328	1,764	986
December	7,109	2,006	2,082	1,784	1,237
Women, 16 years and over—					
January	6,269	2,595	1,727	1,290	657
February	6,061	2,293	1,836	1,275	657
March	5,070	2,223	1,120	1,247	480
April	6,272	2,626	1,792	1,295	559
May	6,367	2,639	1,913	1,322	493
June	6,312	2,610	1,925	1,353	424
July	6,683	2,638	2,043	1,410	592
August	5,982	1,946	2,026	1,399	611
September	5,937	2,017	1,878	1,433	609
October	5,966	2,070	1,887	1,441	568
November	5,911	2,875	1,523	1,431	582
December	4,474	1,238	1,192	1,429	615
Children, under 16 years—					
January	212	74	20	75	43
February	203	67	18	75	43
March	175	58	12	76	29
April	209	56	16	88	49
May	218	62	16	91	49
June	212	69	16	84	43
July	212	68	16	85	43
August	219	68	16	92	43
September	192	41	19	89	43
October	192	41	21	87	43
November	197	55	19	80	43
December	171	28	19	86	43
Miscellaneous expenses:					
Total	$2,089,154	$1,081,132	$405,852	$443,853	$158,317
Rent of works	$12,800		$11,000		$1,800
Taxes, not including internal revenue	$184,892	$127,566	$40,417	$8,888	$8,021
Rent of offices, interest, insurance, etc	$1,891,462	$953,566	$354,435	$434,965	$148,496
Materials used:					
Aggregate cost	$22,682,543	$8,837,688	$7,176,701	$3,794,027	$2,874,127
Principal materials	$22,223,946	$8,645,688	$7,055,945	$3,693,951	$2,828,367
Purchased in raw state	$14,582,768	$5,741,653	$4,887,673	$1,813,274	$2,140,168
Purchased in partially manufactured form	$7,641,178	$2,904,030	$2,168,272	$1,880,677	$688,199
Fuel	$242,619	$85,206	$71,628	$62,297	$23,488
Mill supplies	$123,869	$76,938	$17,238	$22,184	$7,509
Freight	$92,109	$29,861	$31,890	$15,595	$14,763

[1] Includes establishments distributed as follows: Missouri, 1; New Jersey, 2; Pennsylvania, 2.

TABLE 11.—RUBBER BOOTS AND SHOES, BY STATES: 1900—Continued.

	United States.	Massachusetts.	Connecticut.	Rhode Island.	All other states.
Products:					
Aggregate value	$41,089,819	$16,490,015	$11,999,088	$8,034,417	$4,566,349
Boots and shoes, rubber:					
Total number of pairs	49,979,229	19,750,961	15,375,035	10,090,357	4,762,876
Total value	$33,761,320	$15,773,553	$11,513,072	$7,051,812	$4,422,883
Men's—					
Total number of pairs	24,686,643	9,287,315	7,689,297	5,248,239	2,461,292
Total value	$27,160,177	$11,195,770	$7,921,802	$4,593,846	$3,448,759
Rubber boots—					
Number of pairs	3,512,421	2,082,641	770,569	198,619	460,592
Value	$10,572,214	$6,465,974	$2,400,637	$460,432	$1,245,171
Rubber shoes—					
Number of pairs	10,651,684	3,751,082	3,983,525	2,137,672	779,405
Value	$5,518,515	$1,674,087	$2,163,097	$1,185,501	$495,827
Rubber tennis shoes—					
Number of pairs	1,424,448	623,426	30,000	748,728	22,294
Value	$634,041	$336,277	$20,000	$268,888	$8,876
Arctic overs—					
Number of pairs	4,672,862	1,693,052	969,005	1,556,321	457,484
Value	$4,815,075	$1,602,013	$922,668	$1,795,733	$494,661
Lumbermen's overs—					
Number of pairs	4,229,899	996,962	1,936,198	558,766	737,973
Value	$5,488,166	$1,031,158	$2,415,400	$842,550	$1,199,058
Felt boots—					
Number of pairs	147,196	143,752			3,444
Value	$91,427	$86,261			$5,166
Other varieties—					
Number of pairs	48,133			48,133	
Value	$40,739			$40,739	
Women's—					
Total number of pairs	18,847,355	8,105,878	6,247,549	2,964,976	1,528,957
Total value	$8,165,095	$3,042,142	$2,969,100	$1,504,691	$649,762
Rubber boots—					
Number of pairs	308,622	159,174	86,485	29,246	28,717
Value	$464,264	$219,680	$158,055	$50,072	$41,457
Rubber shoes—					
Number of pairs	16,118,746	7,102,051	5,679,019	2,086,385	1,346,291
Value	$5,925,474	$2,231,765	$2,360,254	$842,211	$491,244
Rubber tennis shoes—					
Number of pairs	346,744	220,807	21,456	99,661	4,820
Value	$185,199	$129,357	$15,044	$38,987	$1,811
Arctic overs—					
Number of pairs	2,003,286	623,841	551,330	678,986	149,129
Value	$1,535,992	$461,340	$431,488	$527,884	$115,250
Lumbermen's overs—					
Number of pairs	9,259		9,259		
Value	$9,259		$9,259		
Other varieties—					
Number of pairs	70,698			70,698	
Value	$45,587			$45,587	
Children's—					
Total number of pairs	6,445,231	2,357,273	1,433,189	1,877,142	772,627
Total value	$3,435,448	$1,535,641	$922,179	$953,275	$324,362
Rubber boots—					
Number of pairs	628,009	444,889	84,545	33,641	59,934
Value	$1,123,060	$906,406	$99,327	$45,795	$71,532
Rubber shoes—					
Number of pairs	4,135,463	1,433,431	1,186,167	1,010,151	505,711
Value	$1,299,182	$342,197	$425,176	$381,025	$150,784
Rubber tennis shoes—					
Number of pairs	558,089	206,726	20,000	298,224	33,139
Value	$249,484	$123,541	$12,000	$101,993	$11,950
Arctic overs—					
Number of pairs	971,613	224,296	138,850	492,297	116,170
Value	$634,710	$135,437	$82,827	$371,974	$44,472
Lumbermen's overs—					
Number of pairs	145,418	47,928	8,627	31,602	57,261
Value	$122,176	$28,060	$2,840	$46,260	$45,016
Felt boots—					
Number of pairs	412				412
Value	$608				$608
Other varieties—					
Number of pairs	11,227			11,227	
Value	$6,228			$6,228	
Value of all other products, including custom work and repairing	$2,328,499	$716,462	$485,966	$982,305	$143,466
Comparison of products:					
Number of establishments reporting for both years	17	4	4	5	4
Value for census year	$37,581,998	$14,167,116	$10,974,884	$8,010,042	$4,429,956
Value for preceding business year	$31,541,079	$12,040,550	$9,499,324	$6,356,968	$3,645,137
Power:					
Number of establishments reporting	22	6	5	6	5
Total horsepower	25,205	8,415	7,870	5,595	3,325
Owned:					
Engines (steam)—					
Number	88	27	27	23	11
Horsepower	23,442	8,190	6,467	5,460	3,325
Water wheels—					
Number	14	4	10		
Horsepower	1,525	175	1,350		
Electric motors—					
Number	15		8	7	
Horsepower	188		58	135	
Other power—					
Number	1	1			
Horsepower	50	50			
Furnished to other establishments—					
Horsepower	550		550		
Establishments classified by number of persons employed, not including proprietors and firm members:					
Total number of establishments	22	6	5	6	5
51 to 100	1			1	
101 to 250	3	1	1	1	
251 to 500	3			1	2
501 to 1,000	6	1	1	1	3
1,001 to 5,000	9	4	3	2	

Twelfth Census of the United States.

CENSUS BULLETIN.

No. 172. WASHINGTON, D. C. MAY 21, 1902.

MANUFACTURES.

BUTTONS.

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

SIR: I transmit herewith, for publication in bulletin form, a report on the manufacture of buttons for the census year ending May 31, 1900, prepared under my direction by Mr. Axel Josephsson, of the Census Office.

The statistics included in the report were collected, as in previous censuses, upon the schedule used for the general statistics of manufactures; but owing to the great development of the button industry during the last decade, it was decided to supplement the canvass made by the enumerators and local special agents with a special report.

The manufacture of buttons has figured in the reports of every census, beginning with the Third Census, but as this is the first time it has been made the subject of a special report, the accompanying bulletin presents, in addition to the statistics collected at the census of 1900, a concise history of the industry since its beginning. The most noteworthy feature of its development in the United States has been the rise within the last eight years of the fresh-water shell pearl button industry. This branch of the manufacture did not exist in 1890; since then vast quantities of mussel shells, formerly considered of no value, have been taken from the Mississippi River and made the source of a large revenue to the people of the states of Iowa and Illinois.

The statistics are presented in 11 tables: Table 1 showing comparative figures for the industry at the several censuses; Table 2 showing, by states, the number of establishments in operation in 1890 and 1900; Table 3 showing statistics for the industry by states for 1900; Table 4 showing statistics by states for 1900 for establishments manufacturing only fresh-water pearl button blanks; Table 5 showing statistics of capital for 1890 and 1900; Table 6 showing the cost of materials for 1900; Table 7 showing quantity, value, and percentage of the several kinds of buttons manufactured in the census year 1900; Table 8 showing the number of establishments and value of products for the states reporting button factories at the censuses of 1850 to 1880, inclusive; Table 9 showing the number of establishments, capital, and value of products, by states and geographic divisions for 1890 and 1900; Table 10 showing imports of buttons for each fiscal year from 1891 to 1900, inclusive; Table 11 showing the detailed statistics for the industry by states in 1900.

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

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

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

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

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

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

The reports show a capital of $4,212,568 invested in the manufacture of buttons in the 238 establishments reporting for the United States. This sum represents the value of land, buildings, machinery, tools, and implements, and the live capital utilized, but does not include the capital stock of any of the corporations engaged in this industry. The value of the products is returned at $7,695,910, to produce which involved an outlay of $296,358 for salaries of officials, clerks, etc.; $2,826,238 for wages; $393,862 for miscellaneous expenses, including rent, taxes, etc.; and $2,803,246 for materials used, mill supplies, freight, and fuel. It is not to be assumed, however, that the difference between the aggregate of these sums and the value of the products is, in any sense, indicative of the profits in the manufacture of buttons during the census year. The census schedule takes no cognizance of the cost of selling manufactured articles, or of interest on capital invested, or of the mercantile losses incurred in the business, or of depreciation in plant. The value of the product given is the value obtained or fixed at the works. This statement is necessary in order to avoid erroneous conclusions from the figures presented.

Very respectfully,

Chief Statistician for Manufactures.

THE MANUFACTURE OF BUTTONS.

By AXEL JOSEPHSSON.

Table 1 is a comparative summary of the statistics for the manufacture of buttons as returned at the censuses of 1850 to 1900, inclusive, with the percentages of increase for each decade.

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

	DATE OF CENSUS.						PER CENT OF INCREASE.				
	1900	1890	1880	1870	1860	1850	1890 to 1900	1880 to 1890	1870 to 1880	1860 to 1870	1850 to 1860
Number of establishments	238	106	124	64	48	59	124.5	[1]14.5	93.8	48.8	[1]27.1
Capital	$4,212,568	$3,089,265	$2,013,350	$1,013,700	$558,550	$393,000	36.4	53.4	98.6	81.5	42.1
Salaried officials, clerks, etc., number	339	[2]205	(3)	(3)	(3)	(3)	65.4	.....	.....	.....	.....
Salaries	$296,358	[2]$262,787	(3)	(3)	(3)	(3)	12.8	.....	.....	.....	.....
Wage-earners, average number	8,685	3,831	5,825	1,912	1,161	1,088	126.7	[1]34.2	204.7	64.7	6.7
Total wages	$2,826,238	$1,411,089	$1,645,130	$580,380	$260,206	$225,120	100.3	[1]14.2	183.5	123.0	15.6
Men, 16 years and over	4,086	1,544	2,128	617	487	467	164.6	[1]27.4	244.9	26.7	4.3
Wages	$1,753,133	$805,782	(3)	(3)	(3)	(3)	117.6	.....	.....	.....	.....
Women, 16 years and over	4,131	2,176	3,052	949	674	621	89.8	[1]28.7	221.6	40.8	8.5
Wages	$997,857	$588,901	(3)	(3)	(3)	(3)	69.4	.....	.....	.....	.....
Children, under 16 years	468	111	645	346	(3)	(3)	321.6	[1]82.8	86.4	.....	.....
Wages	$75,248	$16,406	(3)	(3)	(3)	(3)	358.7	.....	.....	.....	.....
Miscellaneous expenses	$393,862	$256,846	(4)	(4)	(4)	(4)	53.3	.....	.....	.....	.....
Cost of materials used	$2,803,246	$1,551,603	$1,792,891	$751,183	$368,885	$324,837	80.7	[1]13.5	138.7	103.6	10.3
Value of products	$7,695,910	$4,216,795	$4,449,542	$1,778,893	$949,408	$964,359	82.5	[1]5.2	150.1	87.4	[1]1.5

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

The figures for 1900 in the above table do not include 20 establishments having a product of less than $500 each. The combined capital of these establishments was $10,405, and the total value of their products was $3,798. They were not included in this table in order to preserve the basis of comparison with previous censuses, at which such establishments were not reported.

Although the manufacture of buttons in the United States began prior to 1810 and statistics for the industry appeared for the first time in the census reports of that year, the census of 1850 was the first at which statistics of a sufficiently uniform character to be compared were presented. The general progress of the industry during the past half century is shown by Table 1. The number of establishments increased from 59 to 238; the capital, from $393,000 to $4,212,568; the average number of wage-earners, from 1,088 to 8,685; the amount of wages paid, from $225,120 to $2,826,238; the cost of materials used, from $324,837 to $2,803,246; and the value of products, from $964,359 to $7,695,910. The greatest growth was that during the decade ending in 1880, when the increase in value of products was 150.1 per cent. From 1880 to 1890 there was a decrease in every particular except that of capital, the value of products, however, showing the least diminution, 5.2 per cent. The last decade showed an increase of 82.5 per cent in value of products. These statistics, while reflecting the increase in the value of products, do not indicate the real growth in the quantity of products manufactured, which has increased in far greater proportions on account of the introduction of new methods of manufacture, whereby prices have been considerably reduced.

A comparison of the statistics for 1900 and 1890 shows the growth of the industry during the decade and its present condition. The number of establishments increased from 106 in 1890 to 238 in 1900, or 124.5 per cent, while the capital increased only from $3,089,265 to $4,212,568, or 36.4 per cent. The button industry, in contrast with most of the larger industries, shows a considerable decrease in the average capital per establishment, the average being $29,144 for 1890 and only $17,700 for 1900. This decrease is due in part to the number of establishments engaged in the manufacture

of fresh-water pearl button blanks, a branch of the industry which has sprung into existence since 1890 and requires a comparatively small capital. Statistics for the establishments engaged exclusively in this manufacture are separately shown in Table 4, and if the capital for these establishments were deducted from the total capital as presented in Table 1, the average capital for establishments engaged principally in the manufacture of buttons would be $21,797. The largest increase during the decade appears in the average number of wage-earners, which increased from 3,831 to 8,685, or 126.7 per cent. The amount of wages paid more than doubled. The cost of materials used increased from $1,551,603 to $2,803,246, or 80.7 per cent, and the value of products from $4,216,795 to $7,695,910, or 82.5 per cent.

Table 2 presents, by states, the number of active establishments in 1900 and 1890, with the increase, and the number of establishments constructed during the decade and during the census year.

TABLE 2.—COMPARATIVE SUMMARY: NUMBER OF ACTIVE ESTABLISHMENTS, 1900 AND 1890, AND INCREASE DURING DECADE, BY STATES, ARRANGED GEOGRAPHICALLY.

STATES.	1900	1890	Increase.
United States	238	106	132
New England states	28	34	[1]6
New Hampshire	1	.....	1
Massachusetts	13	16	[1]3
Rhode Island	3	4	[1]1
Connecticut	11	14	[1]3
Middle states	106	67	39
New York	49	34	15
New Jersey	34	17	17
Pennsylvania	21	14	7
Maryland	2	1	1
District of Columbia	.....	1	[1]1

[1] Decrease

TABLE 2.—COMPARATIVE SUMMARY: NUMBER OF ACTIVE ESTABLISHMENTS, 1900 AND 1890, ETC.—Continued.

STATES.	1900	1890	Increase.
Southern states	2	1	1
Kentucky	1	1	.....
Arkansas	1	.....	1
Central states	95	4	91
Ohio	4	.....	4
Michigan	2	.....	2
Illinois	14	4	10
Wisconsin	9	.....	9
Minnesota	2	.....	2
Iowa	53	.....	53
Missouri	11	.....	11
Western states	2	.....	2
Nebraska	2	.....	2
Pacific states	5	.....	5
California	5	.....	5

Table 2 shows that while in 1890 establishments were found in only 9 states and 1 territory, in 1900 they were distributed over 19 states. Iowa led in number, New York was second, and New Jersey third. Of the new plants, 53 were located in Iowa, where not one button factory existed ten years before. Besides Iowa, 9 of the states reporting button factories in 1900 had none in 1890. In New Jersey 17 establishments began operations during the decade. New York came next with 15, followed by Illinois with 10 establishments.

Table 3 is a summary of the industry, by states, for 1900. In 1890 only 7 states could be shown separately, because in these only was the number of establishments 3 or more; in 1900 there were 12 states having 3 or more. In 1900, 7 states reported fewer than 3 establishments each, and in order that the operations of individual establishments may not be disclosed, they are included under "all other states."

TABLE 3.—SUMMARY BY STATES: 1900.

	United States.	California.	Connecticut.	Illinois.	Iowa.	Massachusetts.	Missouri.	New Jersey.	New York.	Ohio.	Pennsylvania.	Rhode Island.	Wisconsin.	All other states.[1]
Number of establishments.	238	5	11	14	53	13	11	34	49	4	21	3	9	11
Capital:														
Total	$4,212,568	$6,487	$532,178	$53,493	$324,315	$626,439	$39,495	$509,681	$1,195,343	$49,645	$557,488	$29,116	$34,499	$254,389
Land	$145,260	.....	$46,400	$525	$15,685	$33,800	$600	$6,250	$13,100	.....	$24,500	.....	$1,300	$3,100
Buildings	$433,268	.....	$96,000	$1,450	$24,991	$105,300	$3,150	$34,672	$46,900	.....	$47,580	.....	$4,595	$68,630
Machinery, tools, and implements.	$1,310,442	$725	$164,728	$14,271	$111,727	$122,669	$12,188	$154,036	$395,107	$15,500	$200,052	$20,500	$12,539	$86,400
Cash and sundries.	$2,323,598	$5,762	$225,050	$37,247	$171,912	$364,670	$23,557	$314,723	$740,236	$34,145	$285,356	$8,616	$16,065	$96,259
Salaried officials, clerks, etc., number	339	1	24	14	42	19	4	58	105	7	42	4	4	20
Salaries	$296,358	$1,200	$30,812	$7,629	$26,306	$31,164	$1,286	$50,299	$88,195	$4,786	$39,152	$2,464	$1,425	$16,690
Wage-earners, average number	8,685	6	800	272	1,402	772	83	1,169	2,647	72	1,140	28	106	188
Total wages	$2,826,238	$988	$305,687	$101,039	$458,086	$276,202	$23,881	$410,056	$812,978	$18,268	$321,473	$8,501	$32,108	$56,971
Men, 16 years and over.	4,086	.....	305	210	887	302	58	551	1,157	29	347	19	74	147
Wages	$1,753,133	.....	$169,763	$86,174	$361,062	$141,049	$19,133	$258,119	$464,518	$10,504	$166,892	$5,730	$26,088	$44,101
Women, 16 years and over	4,131	2	469	48	441	443	21	544	1,349	40	711	9	26	37
Wages	$997,857	$336	$132,018	$11,302	$86,550	$131,929	$4,220	$135,610	$326,130	$7,140	$141,601	$2,771	$5,880	$12,370
Children, under 16 years	468	4	35	14	74	27	4	74	141	3	82	.....	6	4
Wages	$75,248	$652	$3,906	$3,563	$10,474	$3,224	$528	$16,327	$22,330	$624	$12,980	.....	$140	$360
Miscellaneous expenses	$393,862	$1,277	$117,643	$11,329	$37,252	$27,505	$10,788	$37,879	$110,717	$5,701	$17,683	$4,393	$1,830	$9,805
Cost of materials used	$2,803,246	$2,795	$430,187	$66,213	$196,842	$237,385	$26,679	$398,616	$943,432	$20,946	$403,106	$9,040	$18,751	$48,804
Value of products	$7,695,910	$8,870	$1,087,235	$242,444	$866,538	$681,081	$85,449	$1,025,544	$2,371,196	$58,873	$999,355	$33,589	$63,125	$172,611

[1] Includes establishments distributed as follows: Arkansas, 1; Kentucky, 1; Maryland, 2; Michigan, 2; Minnesota, 2; Nebraska, 2; New Hampshire, 1.

Since the census of 1890 an entirely new branch of the industry has been introduced—the manufacture of fresh-water pearl button blanks. The statistics for the 52 establishments reporting these products exclusively in 1900 are included in Tables 1 and 3, but in view of the great interest taken in the development of this branch, Table 4 is given, showing the statistics, by states, of establishments, number of salaried officials, clerks, etc., and their salaries, average number of wage-earners and their wages, miscellaneous expenses, cost of materials used, and value of products.

TABLE 4.—SUMMARY: ESTABLISHMENTS MANUFACTURING FRESH-WATER PEARL BUTTON BLANKS, BY STATES: 1900.

STATES.	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	52	$158,373	36	$16,124	771	$304,984	$12,044	$161,038	$656,036
Illinois	7	16,893	9	4,924	138	53,052	1,009	25,824	134,104
Iowa	35	102,135	20	9,365	561	227,937	9,521	114,478	467,351
Missouri	5	14,390	1	300	35	11,340	1,016	8,529	23,090
All other states[1]	5	24,955	6	1,535	37	12,655	498	12,207	31,491

[1] Includes establishments distributed as follows: Arkansas, 1; Minnesota, 1; Wisconsin, 3.

Table 4 shows a total of 52 establishments, with a capital of $158,373, 771 wage-earners, and products valued at $656,036. Iowa led with 35 establishments, and products valued at $467,351, or 71.2 per cent of the total. Illinois ranked next with 7 establishments, and products valued at $134,104, or 20.4 per cent of the total.

Table 5 is a comparative summary of capital for 1900 and 1890, with the percentage each item was of the total, and the per cent of increase for the decade.

TABLE 5.—COMPARATIVE SUMMARY: CAPITAL, 1890 AND 1900, WITH PER CENT OF INCREASE.

	1900		1890		Per cent of increase.
	Amount.	Per cent of total.	Amount.	Per cent of total.	
Total	$4,212,568	100.0	$3,089,265	100.0	36.4
Land	145,260	3.4	98,664	3.2	47.2
Buildings	433,268	10.3	208,185	6.7	108.1
Machinery, tools, and implements	1,310,442	31.1	956,094	31.0	37.1
Cash and sundries	2,323,598	55.2	1,826,322	59.1	27.2

Table 5 shows that the percentages of land, buildings, machinery, and live capital in 1900 did not differ materially from the corresponding percentages in 1890, although the rates of increase in the different items varied considerably, being largest for buildings. The total capital increased from $3,089,265 to $4,212,568, or 36.4 per cent. The value of land increased from $98,664 to $145,260, or 47.2 per cent; of buildings from $208,185 to $433,268, or 108.1 per cent; of machinery, tools, and implements from $956,094 to $1,310,442, or 37.1 per cent; and the live capital from $1,826,322 to $2,323,598, or 27.2 per cent.

The miscellaneous expenses increased from $256,846 in 1890 to $393,862 in 1900, or 53.3 per cent. Of this, $207,107, paid for rent of offices, insurance, repairs of buildings and machinery, advertising, and all other sundries not reported under the head of materials, constituted the principal item, or 52.6 per cent. This amount did not include expense of new equipment, machinery, and other apparatus, but only the amount expended for repair of buildings, machinery, and other incidental expenses. The amount of interest in this item did not include the interest paid on bonds by incorporated companies, but only the comparatively insignificant sums necessary for money or credit incidental to the conduct of the business. The amount expended for contract work, $88,040, formed 22.3 per cent and the $84,279 expended for rent of works 21.4 per cent of the total. The amount paid for taxes, $14,436, was a relatively small per cent.

Table 6 gives the cost of the different materials used in 1900, with the per cent each item was of the total.

TABLE 6.—COST OF MATERIALS: 1900.

	1900	
	Amount.	Per cent of total.
Total	$2,803,246	100.0
Purchased in raw state	1,232,938	44.0
Purchased in partially manufactured form	1,437,982	51.3
Fuel	46,665	1.6
Rent of power and heat	33,375	1.2
Freight	52,286	1.9

The total cost of materials used in 1890 was $1,551,603, and in 1900, $2,803,246, an increase of 80.7 per cent, of which $1,232,938, or 44 per cent, was expended for raw materials. The three principal items that went to make up this total were mother-of-pearl shells, fresh-water mussel shells, and vegetable ivory. The quantity of mother-of-pearl (ocean pearl) shells used was 1,748,856 pounds, costing $620,584; of fresh-water mussel shells, 4,830,112 pounds, costing $238,046; and of vegetable ivory, 12,382,720 pounds, costing $275,226. The average cost per pound of mother-of-pearl shells was 35.5 cents; of fresh-water shells, 4.9

cents; and of vegetable ivory, 2.2 cents. Vegetable ivory and mother-of-pearl shells are imported, and statistics for the year ending June 30, 1900, show importations of 16,036,389 pounds of vegetable ivory, valued at $243,548, and shells to the value of $1,016,728.

The value of materials purchased in partially manufactured form was $1,437,982, or 51.3 per cent of the total reported. Among the partly manufactured materials are brass, tin, iron, horn, bone, cloth, and linen hanks and tufts. The fuel, rent of power and heat, and freight constituted 4.7 per cent of the total cost of materials.

In connection with Table 6 attention is directed to a duplication which occurs in the two principal items of materials. The establishments employed in cutting button blanks from mussel shells used a large proportion of the fresh-water shells included under raw material, while of their products, amounting to $656,036, not less than $561,985 reappeared as purchased in partially manufactured form by other factories. The remaining $94,051 of blanks were not made into buttons during the census year.

Table 7 gives the quantity and value of the different varieties of buttons manufactured, with the percentage that each variety is of the total, and the average prices.

TABLE 7.—NUMBER OF GROSS, VALUE, PER CENT OF VALUE OF DIFFERENT KINDS OF TOTAL VALUE, AND AVERAGE PRICE PER GROSS: 1900.

KINDS.	QUANTITY.		VALUE.		Average price per gross.
	Gross.	Per cent of total.	Amount.	Per cent of total.	
Total	21,254,018	100.0	$6,467,373	100.0	$0.30
Bone	297,180	1.4	137,401	2.1	0.46
Cloth	1,372,870	6.5	468,121	7.2	0.34
Composition	2,407,319	11.3	246,410	3.8	0.10
Horn	717,047	3.4	237,874	3.7	0.33
Metal:					
Total	4,759,671	22.4	887,521	13.7	0.19
Brass	3,713,144	17.5	739,922	11.4	0.20
All other metals	1,046,527	4.9	147,599	2.3	0.14
Pearl, fresh-water	4,308,584	20.3	1,176,285	18.2	0.27
Pearl, ocean	4,049,452	19.0	1,951,558	30.2	0.48
Vegetable ivory	2,661,823	12.5	1,144,677	17.7	0.43
Wood	78,200	0.4	9,600	0.2	0.12
Celluloid and photo	105,086	0.5	77,570	1.2	0.74
Paper and all other	496,786	2.3	130,856	2.0	0.26

To obtain the aggregate value of all products for the button industry, there should be added to the value of buttons given in Table 7 the value of button blanks and of all other products. During the census year 5,432,246 gross of fresh-water pearl button blanks were manufactured, valued at $656,036, making the value of buttons and button blanks $7,123,409, or 92.6 per cent of the aggregate; the value of all other products amounted to $572,501, or 7.4 per cent. The fresh-water blanks constituted 8.5 per cent of the aggregate. A total of 21,254,018 gross of buttons was manufactured, giving an average value of 30.4 cents per gross.

Ocean pearl buttons outclassed all others, constituting 30.2 per cent of the total value. Fresh-water pearl buttons stood next with 18.2 per cent, while the vegetable ivory buttons ranked third with a percentage of 17.7. Metal buttons of all kinds formed 13.7 per cent of the total, brass buttons alone constituting 11.4 per cent. Covered or cloth buttons comprised 7.2 per cent of the total value. Composition and horn buttons were nearly equal in importance, forming, respectively, 3.8 and 3.7 per cent of the total value. Last on the list came buttons made from wood, constituting only two-tenths of 1 per cent of the total value. While the price for each kind of buttons varies considerably according to quality and size, it is interesting to note the average price for the different kinds.

To the totals in Table 7 should be added 105,500 gross of buttons, valued at $42,790, obtained from two establishments reporting buttons as a by-product. Of these 72,500 gross were horn, 3,000 metal, and 30,000 rubber buttons. There are, no doubt, a number of manufactories producing buttons as a by-product, but as they have not specified buttons separately, but have included them in "all other products," it is impossible to give any figures for them.

The growth of the button industry, by geographical divisions, is shown in Tables 8 and 9.

Table 8 shows, by states, the number of establishments and value of products in 1850, 1860, 1870, and 1880. Five states practically monopolized the industry in those years, only an insignificant percentage of product being reported from "all other states."

TABLE 8.—COMPARATIVE SUMMARY: NUMBER OF ESTABLISHMENTS AND VALUE OF PRODUCTS, BY STATES, 1850 TO 1880, INCLUSIVE.

STATES.	1880		1870		1860		1850	
	Number of establishments.	Value of products.	Number of establishments.	Value of products.	Number of establishments.	Value of products.	Number of establishments.	Value of products.
United States	124	$4,449,542	64	$1,778,893	43	$949,408	59	$964,359
Connecticut	26	1,110,653	21	563,433	28	547,482	29	562,274
Massachusetts	28	1,085,864	9	511,175	9	275,700	14	284,925
New Jersey	25	797,205	8	190,885	.....	.....	3	22,892
New York	18	916,262	7	141,500	5	120,666	7	64,600
Pennsylvania	18	387,554	18	369,200	1	5,560	3	28,128
All other states	[1] 9	152,004	[2] 1	2,700	.....	.....	[3] 3	6,540

[1] Includes establishments distributed as follows: Illinois, 3; Kentucky, 1; Minnesota, 1; Rhode Island, 1; Tennessee, 1; Vermont, 2.
[2] Missouri.
[3] Includes establishments distributed as follows: Maryland, 1; Ohio, 1; Vermont, 1.

Table 9 presents a comparison between the number of establishments, capital, and value of products for 1890 and 1900, by states, arranged geographically; also the percentage of total and of increase of each item.

TABLE 9.—COMPARATIVE SUMMARY: NUMBER OF ESTABLISHMENTS, CAPITAL, AND VALUE OF PRODUCTS, BY STATES, ARRANGED GEOGRAPHICALLY, WITH PERCENTAGES, 1890 AND 1900.

STATES.	1900							1890						PER CENT OF INCREASE IN—		
	Establishments.		Capital.		Products.			Establishments.		Capital.		Products.				
	Number.	Per cent of total.	Amount.	Per cent of total.	Number of gross.	Value.	Per cent of total value.	Number.	Per cent of total.	Amount.	Per cent of total.	Value.	Per cent of total value.	Number of establishments.	Capital.	Value of products.
United States	238	100.0	$4,212,568	100.0	26,686,264	$7,695,910	100.0	106	100.0	$3,089,265	100.0	$4,216,795	100.0	124.5	36.4	82.5
New England states	28	11.8	1,377,222	32.7	7,273,370	1,902,527	24.7	34	32.1	1,761,254	57.0	2,131,572	50.6	[1]17.6	[1]21.8	[1]10.7
Massachusetts	13	5.5	626,439	14.9	2,127,345	681,081	8.9	16	15.1	779,135	25.2	1,071,687	25.4	[1]18.8	[1]19.6	[1]36.4
Connecticut	11	4.6	532,178	12.6	4,668,359	1,087,235	14.1	14	13.2	914,796	29.6	928,028	22.0	[1]21.4	[1]41.8	17.2
All others[2]	4	1.7	218,605	5.2	477,666	134,211	1.7	[3]4	3.8	67,323	2.2	131,857	3.2	.....	224.7	1.8
Middle states	104	43.7	2,262,512	53.7	11,898,171	4,396,095	57.1	65	61.3	1,244,126	40.3	1,996,013	47.3	60.0	81.9	120.2
New York	49	20.6	1,195,343	28.4	6,779,482	2,371,196	30.8	34	32.1	653,215	21.1	1,012,694	24.0	44.1	83.0	134.2
New Jersey	34	14.3	509,681	12.1	2,155,025	1,025,544	13.3	17	16.0	295,555	9.6	596,600	14.1	100.0	72.4	71.9
Pennsylvania	21	8.8	557,488	13.2	2,963,664	999,355	13.0	14	13.2	295,356	9.6	386,719	9.2	50.0	88.8	158.4
Central states	95	39.9	511,397	12.1	7,233,893	1,326,888	17.3	4	3.8	42,725	1.4	46,860	1.1	2,275.0	1,097.0	2,731.6
Ohio	4	1.7	49,645	1.2	128,372	58,873	0.8	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois	14	5.9	53,493	1.3	851,098	242,444	[5]3.2	4	3.8	42,725	1.4	46,860	1.1	250.0	25.2	417.4
Wisconsin	9	3.8	34,499	0.8	366,556	63,125	0.8	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iowa	53	22.2	324,315	7.7	5,413,130	866,538	11.3	.....	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	11	4.6	39,495	0.9	440,360	85,449	1.1	.....	.....	.....	.....	.....	.....	.....	.....	.....
All others[4]	4	1.7	9,950	0.2	34,377	10,459	0.1	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other states[6]	11	4.6	61,437	1.5	280,880	70,400	0.9	[3]3	2.8	41,160	1.3	42,350	1.0	266.7	49.3	66.2

[1] Decrease.
[2] Includes establishments distributed as follows: New Hampshire, 1; Rhode Island, 3.
[3] Includes establishments distributed as follows: Rhode Island, 4.
[4] Includes establishments distributed as follows: Michigan, 2; Minnesota, 2.
[5] Includes establishments distributed as follows: Arkansas, 1; California, 5; Kentucky, 1; Maryland, 2; Nebraska, 2.
[6] Includes establishments distributed as follows: District of Columbia, 1; Kentucky, 1; Maryland, 1.

From the beginning of button manufacture in this country down to 1890, almost the entire industry was carried on in the New England and Middle states. The census of 1810 was the first at which the manufacture was shown, and then only 3 states reported products: Connecticut, 155,000 gross, value $102,125; Pennsylvania, 11,608 gross, value $3,494; and Virginia, $300; the total value of products for the industry being $105,919. At the census of 1890 the New England and Middle states reported 93.4 per cent of the establishments, 97.3 per cent of the capital, and 97.9 per cent of the products.

The statistics for 1900 show a great change. The Central states, which in 1890 were credited with 4 establishments, or 3.8 per cent of the aggregate, reported 95, or 39.9 per cent. The capital invested in this group increased from $42,725, or 1.4 per cent of the aggregate, to $511,397, or 12.1 per cent, and the value of products increased from $46,860, or 1.1 per cent of the aggregate, to $1,326,888, or 17.3 per cent. In 1890 Illinois was the only state in this group reporting the manufacture of buttons; 4 establishments there having products valued at $46,860. In 1900 the state had 14 establishments and products valued at $242,444. Iowa contributed 53 new plants, with products valued at $866,538, or 65.3 per cent of the total for the division. Thus, as to number of establishments, Iowa has taken the first place among all the states. The states of Ohio, Wisconsin, Michigan, Minnesota, Missouri, and Nebraska also engaged in the manufacture for the first time.

The number of establishments in the New England and Middle states increased from 99 in 1890 to 132 in 1900, or 33.3 per cent, but the percentage which they formed of the total number of establishments in the United States decreased from 93.4 in 1890 to 55.5 in 1900. The decrease in the proportion of the capital was not so marked. In 1890 the total capital for these two groups was $3,005,380, or 97.3 per cent of the aggregate; in 1900 it was $3,639,734, or 86.4 per cent of the aggregate, an increase of 21.1 per cent. In 1890 the value of products was $4,127,585, or 97.9 per cent of the aggregate; in 1900 it was $6,298,622, showing an increase of 52.6 per cent, although forming only 81.8 per cent of the aggregate value.

The growth of the industry outside of the New England and Middle states was chiefly in the manufacture of fresh-water pearl buttons and blanks—a branch of the industry, which, as already pointed out, requires a relatively small amount of capital per establishment. This explains why there was a greater reduction in the percentage of establishments reported for the New England and Middle states than in that of capital and products.

In 1900 New York held the first place in value of products, having displaced Massachusetts, which was first in 1890; Connecticut held the second place, New Jersey the third, Pennsylvania the fourth, Iowa the fifth, and Massachusetts the sixth. The number of establishments in New York increased from 7 in 1850 to 49 in 1900; and the value of products from $64,600 to $2,371,196.

The number of establishments in "all other states" was 3 in 1890, or 2.8 per cent of the aggregate; their capital was $41,160, or 1.3 per cent of the aggregate; and the value of their products amounted to $42,350, or 1 per cent of the aggregate. While the number of establishments reported at the census of 1900 was 11, an increase of 266.7 per cent, the capital had increased only 49.3 per cent, being 1.5 per cent of the aggregate, and the value of products increased only 66.2 per cent, forming nine-tenths of 1 per cent of the aggregate.

The New England states produced in 1900, 7,273,370 gross, or 27.3 per cent of the aggregate; the Middle states 11,898,171 gross, or 44.6 per cent; the Central states 7,233,893 gross, or 27.1 per cent; while all other divisions produced only 280,830 gross, or 1 per cent.

The centers of the different branches of the industry are located as follows:

Bone buttons, Pennsylvania.

Brass buttons, Connecticut, New York.

Cloth buttons, Massachusetts.

Composition buttons, Pennsylvania, New York.

Fresh-water pearl button blanks, Iowa, Illinois.

Fresh-water pearl buttons, New York, Iowa, Pennsylvania.

Horn buttons, Connecticut.

Ocean-pearl buttons, New York, New Jersey, Pennsylvania.

Paper buttons, New Hampshire.

Tin buttons, New Jersey.

Vegetable ivory buttons, New York, Massachusetts, New Jersey.

Table 10 presents the kinds and value of buttons and button forms imported, 1891 to 1900, inclusive.

TABLE 10.—BUTTONS AND BUTTON FORMS, VALUE OF IMPORTS FOR CONSUMPTION, 1891 TO 1900, INCLUSIVE.[1]

KINDS.	1900	1899	1898	1897	1896	1895	1894	1893	1892	1891
Total	$600,982	$450,958	$426,125	$958,235	$1,393,224	$1,084,836	$430,905	$1,393,046	$1,846,247	$2,176,046
Agate buttons	103,745	81,162	53,736	229,083	240,410	195,737	180,138	191,538	161,848	322,063
Bone buttons	12,450	4,256	2,001	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Collar and cuff buttons and studs	156,576	131,031	113,896	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Glass buttons	27,937	39,701	5,725	31,221	132,553	66,463	8,843	51,022	104,676	.....
Horn and vegetable ivory buttons	71,452	30,158	103,153	[3]259,599	[3]293,041	[3]267,456	[3]156,311	[3]471,075	[3]407,472	[3]175,313
Metal buttons, not specially provided for	58,189	64,548	29,738	110,428	295,293	79,749	41,998	195,696	133,728	.....
Nickel bar buttons	1,044	821	400	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Pearl or shell buttons	36,262	24,239	36,557	259,278	332,210	375,886	38,284	275,216	292,332	100,001
Shoe buttons of paper, board, etc	425	549	2,004	8,333	12,285	12,914	2,552	7,703	12,100	6,811
Silk buttons	805	1,140	1,371	.....	1,820	1,097	480	1,762	8,731	17,859
Trousers buttons:										
Steel	182	329	1,477	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Other metal	530	925	1,903	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Other buttons, not specially provided for	18,426	7,913	6,077	(2)	(2)	(2)	(2)	(2)	(2)	(2)
Button forms, lastings, mohair cloth, silk, or other manufactures of cloth, made or cut in such manner as to be fit for buttons exclusively	112,959	64,181	67,487	55,293	85,612	85,534	52,299	199,034	225,360	590,848
Not specially provided for, not including brass, gilt, or silk buttons	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)	951,181

[1] Commerce and Navigation of the United States, United States Treasury Department.
[2] Not reported separately.
[3] Includes values of bone buttons.

These imports were not classified until 1891. While the imports fell from $3,899,132 in 1886 to $3,155,500 in 1890, or only 19.1 per cent, the decrease from 1890 to 1900 was from $3,155,500 to $600,982, or 81 per cent. In 1886 and 1890 brass and gilt buttons were included under the manufactures of brass, and could not be separated. As they were included in the total for 1900, the decrease was in reality still larger than the above figures indicate.

The classification of button imports for 1891 was incomplete. The very large amount of "all other kinds" included metal, glass, and probably some pearl buttons, the value given under the separate heading "pearl buttons" being abnormally low. The importations of pearl buttons, which previous to 1891 constituted the largest part of the imports, had almost ceased in 1900. In this connection extracts from three reports of the United States consuls-general at Vienna, Austria, are interesting.

On December 30, 1887, Consul-General Jussen reported as follows: "The manufacture of pearl buttons is not an industry of the United States, and probably never will be. The reason why this industry can not thrive in the United States is quite obvious. Pearl buttons can not be manufactured by machinery, but, owing to the brittle nature of the raw material, they must of necessity be made by hand. As this hand labor is performed at the low rate of from $2 to $2.80 per week, the competition of the American laborer is out of the question. The declared value of pearl buttons exported from Austria to the United States during the year 1886 amounted to $1,681,747." On December 31, 1889, Consul-General Goldschmidt reported the exports of pearl buttons from Austria to the United States as follows: 1884, $1,496,000; 1887, $1,612,000; 1888, $1,558,000; and 1889, $1,352,000. Two years later, in 1891, the total importation of pearl buttons into the United States had fallen to $100,001. In 1895 it was $375,886, but in 1900 it amounted to only $36,262. On April 29, 1898, Consul-General Hurst reported as follows: "The pearl button industry of Austria-Hungary, which in former years occupied a prominent place among the flourishing industries of the monarchy, has dwindled of late to such an insignificant figure that pearl buttons can no longer be regarded as one of the principal articles of export to the United States. This may be attributed to the development of the industry in the United States."

The principal kinds of buttons imported are agate

buttons, which are not manufactured in the United States; the higher grades of collar and cuff buttons; ivory buttons; and button coverings, including linen hanks and tufts. The importation of this last class decreased from $599,848 in 1891 to $112,959 in 1900, or 81.2 per cent. The importation of silk buttons had practically ceased. In 1886 it amounted to $55,583, and in 1900 to $805, or a decrease of 98.1 per cent.

Previous to 1890 there were no exports of buttons from the United States, but during the last few years considerable quantities have been sent abroad. The value of these exports can not be given, as they are not classified as buttons in the Treasury Department's schedule, but according to the material, or, in many instances, as "notions."

HISTORICAL AND DESCRIPTIVE.

The button, which to-day is one of the indispensable parts of civilized wearing apparel, is an article of comparatively modern invention. Its earliest appearance, in its modern application, is found in the time of Edward I. As a trade of any importance the making of buttons dates back no further than the reign of Elizabeth, when, in connection with the newly invented buttonhole, buttons were often used as a means of holding garments together. These buttons were wholly a product of needlework, with the exception of the wooden mold. A manufactory for the making of brass buttons was established at Birmingham, England, in 1689, and that city soon became the center of the industry, remaining so to this day. From that time buttons have been divided into three general classes: shank buttons, hole buttons, and covered buttons. As late as the beginning of the Nineteenth century covered buttons were made by hand by covering a wooden mold or form with the desired materials. This mode of manufacture was revolutionized by B. Sanders, a Dane, who emigrated to Birmingham after having lost all his property by the bombardment of Copenhagen in 1807. Mr. Sanders conceived the idea of making the button in two parts. Two disks or molds were made of sheet brass or tin. The upper disk, after having its edge turned up, was covered with cloth. The under disk, which was smaller than the upper and convex in shape, had a wire shank put inside. The material which was to keep this shank in place was inserted, and the two disks were pressed together, the turned edges interlocking, making a perfect button. A son of Mr. Sanders made the seemingly trivial, but, for practical purposes, very important improvement of substituting a canvas or cloth tuft for the metal shank. Though many improvements have been made in the process of manufacturing covered buttons, the principle of Mr. Sanders' invention has not been superseded.

It is stated that Casper Wistar manufactured brass buttons in Philadelphia prior to 1750.[1] This is the earliest mention of button manufacture in the United States. Soon after that Henry Witeman set up the manufacture of metal buttons near the Fly Market in New York.[1] Another pioneer was Benjamin Randolph, at the Golden Eagle, on Chestnut street, Philadelphia, who, toward the end of the Eighteenth century, manufactured wooden buttons "of apple, holly, and laurel wood, hard and clear," but as late as 1797 there were only two button factories in Philadelphia.[2] The soldiers of the Revolution wore metal buttons of prescribed patterns, but these were imported from France.

The first button factory in Waterbury, Conn.,—now the center of the metal-button industry—of which there is any record, was established just before 1800 by Henry, Samuel, and Silas Grilley.[3] Their buttons were made of block tin or pewter and cast iron molds. About 1800 great improvements were made in Europe in the making and attaching of shanks or eyes to metal buttons, and in 1802 the firm of Abel Porter & Co. was organized for the manufacture of metal buttons in Waterbury. It took this concern eighteen months to get started, and when ready for business it employed 13 men, of whom 4 were members of the firm. The copper was obtained by the purchase of old stills, teakettles, etc., which were cast into ingots and taken to an iron mill in Bradleyville to be rolled into sheets. These were afterwards finished at the button factory on a pair of rolls 2 inches wide, driven by horsepower. The capital of this concern had been exhausted during the long period of experiments, and the establishment soon changed hands. Little progress was made until 1820, when an Englishman, James Croft, who had a thorough knowledge of the business, was employed, and thereafter the development of the metal-button industry was comparatively rapid.

Metal buttons, whether oval or flat, are made from rolled brass plate. Originally the flat buttons were solid and struck out as blanks from a thick plate; the shank was soldered on afterwards, and the whole was then finished by gilding or silvering. Later, when Mr. Sanders' principle was applied in making metal buttons, the upper blank was driven by a heavy pressure into a die of hardened steel, which gave it the desired shape and pattern. The under blank was similarly pressed in another die, which also riveted the shank into the plate. The two dies were then pressed together and the button was complete except the finishing, which process was accomplished by electroplating.

The manufacture of covered buttons by machinery had not been attempted in the United States until about 1827. Samuel Williston was the founder of the industry. In his home at Easthampton, Mass., he and his wife commenced covering buttons by hand. By the gradual introduction of machinery the business grew, until about 1834 he associated with himself Joel and Josiah Hayden, of Haydenville, with the object of improving the machines. At first they met with failure, but later on, with the

[1] History of American Manufactures, by J. L. Bishop, Part I, page 574.

[2] History of American Manufactures, by J. L. Bishop, Part I, page 575.

[3] Ibid., Part III, page 360.

assistance of Francis Sidney, who had worked in button factories in England, they succeeded in producing fairly good machinery. Inventors have been constantly introducing labor- and time-saving machinery, and to-day the greater part of the work is done automatically. At the present time nearly all the lastings and other parts used to cover the buttons are manufactured in the United States, but before 1892 they were imported from Europe.

Aaron Benedict started to manufacture ivory and horn buttons in Waterbury, Conn., about 1812. The raw material of the horn button is generally the hoofs of cattle. The hoofs are boiled in large kettles, which process softens them; then they are cut by machines into pieces, which other machines form into buttons. These go under a hydraulic press, which stamps the desired patterns upon them. Still different machines are used for boring holes and for polishing.

The vegetable ivory button industry was introduced into the United States in 1859, when A. W. Critchlow, an Englishman, started a factory at Leeds, Mass. The raw material is the seed of the fruit of Phytelephas Macrocarpa, a low-growing palm of South America; the principal shipping point for which is Colon, Colombia. The seed is commonly known as the ivory nut, and is about the size of a hen's egg. The albumen is close-grained and very hard, resembling the finest ivory in texture and color. These nuts are either cut in halves, from which the buttons are sawed out, or sawed in small blocks, from which the larger buttons are formed. The vegetable ivory is especially adapted to the application of colors. The methods of manufacture of the vegetable ivory buttons have changed very little since the time of its introduction here, but great progress has been made in the dyeing of the buttons in various colors and patterns, and also in the finish, and to-day the products of the home factories rival the European product. This branch of the industry ranks third.

In 1862 attempts were made in Newark, N. J., to manufacture composition buttons, but owing to mechanical difficulties which seemed insurmountable, the enterprise was soon abandoned. Twelve years later an attempt was made in New York City to start this industry, but, though more successful than the preceding ones, it had to be abandoned after one year. In 1875, however, Isaac Smith, of New York, associated himself with the Dickinson Hard Rubber Company, of Springfield, Mass., and this concern solved the mechanical difficulties and made the manufacture of composition buttons a success. These buttons, which closely resemble those manufactured from vegetable ivory, are made of plastic material, i. e., a mass which softens under the influence of heat and becomes hard when cold. The ingredients used are certain fossil and vegetable gums, combined with finely comminuted carbonate of lime, feldspar, mica, or kindred minerals. These ingredients are thoroughly mixed in steam-heated grinders. When the minerals are properly amalgamated with the gums, the mass is run off in sheets and allowed to cool. Later these sheets are placed on hot platens, contact with which softens them, and facilitates cutting into strips of convenient form for placing in the dies.

Soon after 1875 a tremendous impetus was given to this branch of the button industry by the fashion, then coming into vogue, of trimming ladies' garments lavishly with buttons, not merely for fastening purposes but also for ornamentation. Such was the demand of the trade that the manufacturers were unable to supply it. This demand stimulated inventive genius, and several epoch-making inventions followed. Among these were the use of templates in making dies, invented by Charles R. Wickes and patented by him in 1877, and the pin plate to mold buttons with holes, invented by Mr. Wickes and Philip L. Sylvester and patented by them in 1878. Previous to this time all holes had to be bored by hand after the button had been molded. In 1880 hydraulic presses were introduced, and in 1882 one of the most progressive steps in the making of composition buttons was taken when the automatic button machine was invented by Mr. Sylvester. By the use of this machine the possible production of buttons was largely increased. The method of mixing and preparing the plastic material was greatly improved by another invention of Mr. Sylvester, as described in letters patent issued March, 1900. There are only 5 factories in the United States producing composition buttons, but 2 of them, located in Pennsylvania and New York, are among the largest in the world.

A peculiar branch of the button industry in the United States is the manufacture of campaign and society buttons, mostly from celluloid. Another kind which has been manufactured in large quantities during the last few years is the photo button. Buttons are also made from potatoes, and can not be distinguished from horn, ivory, and bone buttons save by a careful examination.[1] It is not commonly known that if the common Irish potato be treated with certain acids it becomes almost as hard as stone. A few years ago there was a factory in Brooklyn, N. Y., at which buttons, etc., were made from potatoes, but there is no record of its present existence. Buttons made from skim milk—casein—were introduced in London some years ago, and small quantities have been made in the United States. Buttons made from blood have also been on the market, and during the last decade buttons were made in Massachusetts from Lamaniaria, a brown seaweed. From the establishment of the United States Patent Office until the year 1900, 348 patents were granted for button machines and 1,355 for the making of buttons.

The most important branch of the button industry of to-day in the United States is the manufacture of pearl buttons. It embraces buttons made from mother-of-pearl and from the shells of the Unios, which are so abundant in the Mississippi River. In value the production of these varieties of buttons in 1900 formed 48.4 per cent of the product reported for the entire button industry. (Table 7.) The making of buttons from

[1] Cole's Dictionary of Dry Goods.

mother-of-pearl was introduced into the United States on a small scale about 1855. At that time, and for many years thereafter, the shells were brought from China, but now the markets of the world are supplied principally from South Australia and from the South Sea Islands. The technical name for buttons made of mother-of-pearl is "ocean pearl," while those made from the shell of the Unio are called "fresh-water pearl" buttons. The higher grades of pearl buttons are still manufactured from the ocean shell, and the production of these far outranked that of all other kinds, constituting 30.2 per cent of the total value of buttons manufactured in the United States.

In 1890 there was not a single fresh-water pearl button made in the United States. In 1900 the making of these buttons constituted the second most important branch of the button industry. In Europe shells of the mussels found in rivers have been utilized for button making for the last fifty years. To Mr. J. F. Boepple, of Muscatine, Iowa, belongs the credit of having started the industry in the United States, and now it is the source of income for thousands of persons. In 1891 Mr. Boepple, who is a native of Hamburg, Germany, where he learned the trade of making pearl buttons, formed a partnership for the manufacture of buttons from the "Unio," or "niggerhead" shells, as they are called locally, which were banked up for miles along the river in front of Muscatine. After experimenting for some time this concern found the business unprofitable and it was dissolved. Nothing daunted, Mr. Boepple continued making the buttons, on a small scale, at his home. He finally organized a company which, by the process of manufacture and machinery utilized in Austria and Germany, succeeded in making the enterprise a success. The tools needed in the manufacture of shell buttons were of the simplest character, consisting, for the most part, of turning lathes worked by steam or foot power; consequently it was not long before the Mississippi River was lined with button factories all the way from Red Wing, Minn., to Louisiana, Mo. Muscatine, Iowa, became the center of this new industry. A few years ago there were more than 40 factories in that city for the cutting of blanks and for the making of buttons, but the tendency toward concentration has made itself felt, as has also the need of improved machinery and large capital to withstand the tremendous competition, and all along the river the smaller concerns are being eliminated. The difference in price between the ocean shells and the Unios has been an important factor in the development of the fresh-water button industry. A few years ago the mussel shells were delivered at the factories at about 50 to 60 cents per 100 pounds, while at the same time ocean shells were worth from $30 to $60 for the same quantity. In February, 1898, prices went up to $18 to $20 per ton for "niggerheads," but in July of the same year they were cheaper than ever before or since, selling at 30 cents per 100 pounds. The cheapest grade of ocean shells are the Panama, which sell at 10½ cents per pound.

The improvements in machinery in recent years have been so rapid that some manufacturers have exchanged their machines three times in three years, each time practically reequipping the entire plants.

The following is a short résumé of the mode of making pearl buttons: After the mussels have been cooked and the meat removed, the shells are taken to the factories and stored in sheds. They are then sorted into three different sizes and soaked in barrels of water from three to six days to render them less brittle. They must be used while wet, otherwise they crumble under the saw. The next step is the cutting or sawing of the rough blanks. The shells are usually held with pliers while being cut, but some sawers hold them in their hands. The saws are hollow, cylindrical pieces of steel, 2 inches wide, and with a diameter corresponding to the size of the button. At one end these cylinders are provided with fine teeth; they are adjusted to lathes in which they revolve. As the sawer holds the shell against the saw, the blanks are cut out and passed back into the saw and saw holder and drop into a receiver. The next step is the dressing or grinding of the back of the blank to remove the skin and make an even surface. To accomplish this, each blank has to be held with the finger against a revolving emery wheel. Then comes the turning, by which the front of the button is given its form, including the central depression. When the holes are drilled the button is complete, with the exception of the polishing process, which brings out the natural luster which was lost in the grinding. It is this luster which gives the buttons their chief value. The polishing is effected by placing the buttons in bulk in large wooden tumblers or kegs, in which they are subjected to the action of a chemical fluid as the tumblers revolve. By mutual contact, combined with the effect of the fluid, the buttons become highly lustrous. Then they are washed, dried, and sorted into sizes and grades of quality. After being sewed on cards and packed in pasteboard boxes, the buttons are ready for the market.

The majority of the factories in the West do not finish the buttons, but merely cut the blanks. These are then sent to the factories in the East, which are supplied with improved machinery for the finishing of the buttons. Some of these Eastern factories formerly made buttons out of imported mother-of-pearl shells, but now their principal work is the finishing of the home product.

Notwithstanding the enormous progress this branch of the industry has made during the last five years, it is yet in its infancy. The only disquieting circumstance is the injudicious and wanton depredation of the shell deposits. The beds in front of Muscatine, Iowa, are already exhausted, and unless something is done to protect the mussels, it will not be long before the raw material for this industry will be exhausted.

Table 11 shows in detail the statistics relating to the manufacture of buttons as returned in 1900.

TABLE 11.—BUTTONS,

		United States.	California.	Connecticut.	Illinois.
1	Number of establishments	238	5	11	14
2	Established during the decade	186	5	1	13
3	Established during the census year	51	.....	.....	3
	Capital:				
4	Total	$4,212,568	$6,487	$582,178	$53,493
5	Land	$145,260	.....	$46,400	$525
6	Buildings	$433,268	.....	$96,000	$1,450
7	Machinery, tools, and implements	$1,310,442	$725	$164,728	$14,271
8	Cash and sundries	$2,323,598	$5,762	$225,050	$37,247
9	Proprietors and firm members	267	6	10	15
	Salaried officials, clerks, etc.:				
10	Total number	339	1	24	14
11	Total salaries	$296,358	$1,200	$30,812	$7,629
	Officers of corporations:				
12	Number	51	.....	4	.....
13	Salaries	$76,966	.....	$9,000	.....
	General superintendents, managers, clerks, and salesmen:				
14	Total number	288	1	20	14
15	Total salaries	$219,392	$1,200	$21,812	$7,629
	Men:				
16	Number	235	.....	16	13
17	Salaries	$196,625	.....	$20,248	$7,213
	Women:				
18	Number	53	1	4	1
19	Salaries	$22,767	$1,200	$1,564	$416
	Wage-earners, including pieceworkers, and total wages:				
20	Greatest number employed at any one time during the year	10,490	6	876	314
21	Least number employed at any one time during the year	7,708	6	666	264
22	Average number	8,685	6	800	272
23	Wages	$2,826,238	$988	$305,687	$101,039
	Men, 16 years and over:				
24	Average number	4,086	.....	305	210
25	Wages	$1,753,133	.....	$169,763	$86,174
	Women, 16 years and over:				
26	Average number	4,131	2	460	48
27	Wages	$997,857	$336	$132,018	$11,302
	Children, under 16 years:				
28	Average number	468	4	35	14
29	Wages	$75,248	$652	$3,906	$3,563
	Average number of wage-earners, including pieceworkers, employed during each month:				
	Men, 16 years and over:				
30	January	4,216	.....	270	229
31	February	4,271	.....	306	219
32	March	4,363	.....	291	226
33	April	4,401	.....	304	242
34	May	4,271	.....	311	219
35	June	3,766	.....	311	191
36	July	3,707	.....	296	194
37	August	3,837	.....	307	189
38	September	3,908	.....	318	192
39	October	4,042	.....	317	197
40	November	4,121	.....	314	201
41	December	4,129	.....	312	221
	Women, 16 years and over:				
42	January	4,071	2	383	51
43	February	4,136	2	463	51
44	March	4,299	2	448	51
45	April	4,330	2	469	51
46	May	4,196	2	487	47
47	June	4,068	2	475	47
48	July	3,880	2	426	47
49	August	3,950	2	443	47
50	September	4,068	2	485	47
51	October	4,207	2	487	47
52	November	4,259	2	482	47
53	December	4,108	2	472	47
	Children, under 16 years:				
54	January	459	4	31	14
55	February	449	4	35	14
56	March	450	4	36	14
57	April	478	4	37	14
58	May	462	4	39	14
59	June	475	4	34	14
60	July	455	4	34	14
61	August	458	4	36	14
62	September	477	4	36	14
63	October	492	4	36	14
64	November	493	4	34	14
65	December	468	4	37	14
	Miscellaneous expenses:				
66	Total	$393,862	$1,277	$117,643	$11,329
67	Rent of works	$84,279	$635	$3,979	$3,487
68	Taxes, not including internal revenue	$14,436	$50	$3,681	$95
69	Rent of offices, interest, insurance, and all sundry expenses not hitherto included	$207,107	$592	$37,751	$7,747
70	Contract work	$88,040	.....	$72,232	.....
	Materials used:				
71	Total cost	$2,803,246	$2,795	$430,187	$66,218
72	Principal materials	$2,386,696	$2,567	$287,404	$60,824
73	Fuel	$46,665	$2	$9,462	$2,023
74	Rent of power and heat	$33,375	$48	$1,898	$580
75	Mill supplies	$31,728	$10	$2,034	$714
76	All other materials	$252,496	$188	$120,709	$1,350
77	Freight	$52,286	$30	$8,680	$772
	Products:				
78	Aggregate value	$7,695,910	$8,870	$1,087,235	$242,444
	Buttons:				
79	Total number of gross	21,254,018	23,570	4,668,359	220,155
80	Total value	$6,497,373	$7,250	$890,808	$101,640
	Bone:				
81	Gross	297,180	2,500	.....	.....
82	Value	$137,401	$500	.....	.....
	Cloth:				
83	Gross	1,372,870	20,600	232,141	57,700
84	Value	$468,121	$5,750	$55,990	$10,740

[1] Includes establishments distributed as follows: Arkansas, 1; Kentucky, 1; Maryland, 2; Michigan, 2; Minnesota, 2; Nebraska, 2; New Hampshire, 1.

BY STATES: 1900.

Iowa.	Massachusetts.	Missouri.	New Jersey.	New York.	Ohio.	Pennsylvania.	Rhode Island.	Wisconsin.	All other states.[1]	
53	13	11	34	49	4	21	3	9	11	1
53	5	11	25	34	4	13	2	9	11	2
22	1	6	2	6	.....	2	1	5	3	3
$324,315	$626,439	$89,495	$509,681	$1,195,343	$49,645	$557,488	$29,116	$84,499	$254,389	4
$15,685	$33,800	$600	$6,250	$13,100	.....	$24,500	.....	$1,300	$3,100	5
$24,991	$105,300	$3,150	$34,672	$46,900	.....	$47,580	.....	$4,595	$68,630	6
$111,727	$122,669	$12,188	$154,036	$395,107	$15,500	$200,052	$20,500	$12,539	$86,400	7
$171,912	$364,670	$23,557	$314,723	$740,236	$34,145	$285,356	$8,616	$16,065	$96,259	8
61	12	15	43	48	5	30	2	9	11	9
42	19	4	53	105	7	42	4	4	20	10
$26,306	$81,164	$1,236	$50,299	$83,195	$4,786	$39,152	$2,464	$1,425	$16,690	11
5	4	.....	8	13	1	7	.....	3	6	12
$5,120	$13,900	.....	$13,025	$14,216	$2,500	$11,760	.....	$1,325	$6,120	13
37	15	4	45	92	6	35	4	1	14	14
$21,186	$17,264	$1,236	$37,274	$68,979	$2,286	$27,892	$2,464	$100	$10,570	15
33	9	1	42	77	5	25	2	1	11	16
$20,288	$15,200	$300	$36,213	$62,547	$1,870	$22,332	$1,564	$100	$8,750	17
4	6	3	3	15	1	10	2	.....	3	18
$898	$2,064	$936	$1,061	$6,432	$416	$5,060	$900	.....	$1,820	19
1,892	871	148	1,363	3,184	109	1,273	62	150	242	20
1,303	679	118	956	2,292	68	1,074	19	106	157	21
1,402	772	83	1,169	2,647	72	1,140	28	106	188	22
$458,086	$276,202	$23,881	$110,056	$812,978	$18,268	$321,473	$8,501	$32,108	$56,971	23
887	302	58	551	1,157	29	347	19	74	147	24
$361,062	$141,049	$19,133	$258,119	$464,518	$10,504	$166,892	$5,730	$26,088	$44,101	25
441	443	21	544	1,349	40	711	9	26	37	26
$86,550	$131,929	$4,220	$135,610	$326,130	$7,140	$141,601	$2,771	$5,880	$12,370	27
74	27	4	74	141	3	82	.....	6	4	28
$10,474	$3,224	$528	$16,327	$22,330	$624	$12,980	.....	$140	$500	29
1,016	296	76	507	1,185	31	355	16	89	146	30
988	292	80	535	1,214	31	357	25	90	134	31
1,005	295	96	550	1,224	31	371	34	85	155	32
969	300	97	555	1,281	31	356	22	85	159	33
890	298	87	550	1,248	34	355	17	90	172	34
749	291	40	549	1,052	27	336	11	67	142	35
797	303	21	531	1,024	27	325	11	44	134	36
801	296	21	538	1,118	27	334	21	50	135	37
800	304	36	580	1,105	27	338	16	61	131	38
841	318	46	581	1,146	28	338	16	71	143	39
898	313	51	575	1,159	28	348	18	74	147	40
919	319	51	556	1,129	28	348	20	76	150	41
442	456	24	518	1,402	35	693	6	21	35	42
342	457	27	562	1,384	38	744	10	25	31	43
420	446	27	564	1,401	47	812	18	26	37	44
427	463	23	573	1,419	53	763	21	27	39	45
463	446	21	498	1,414	65	684	8	26	35	46
432	448	24	537	1,314	35	688	3	27	30	47
450	457	9	504	1,206	35	681	4	21	35	48
458	434	9	518	1,232	35	704	11	23	34	49
454	443[2]	13	540	1,298	36	683	7	27	33	50
471	428	13	571	1,387	34	694	8	28	37	51
479	426	27	582	1,399	34	703	9	27	42	52
452	413	31	556	1,335	34	683	7	28	48	53
73	24	4	76	139	2	82	.....	6	4	54
67	25	4	77	127	2	84	.....	6	4	55
72	26	4	73	126	2	83	.....	6	4	56
71	28	4	75	154	2	80	.....	6	3	57
71	26	4	66	139	6	83	.....	6	4	58
76	28	3	68	160	4	84	.....	6	4	59
76	30	3	73	125	4	82	.....	6	4	60
76	26	3	74	131	2	83	.....	6	3	61
76	29	3	80	143	2	80	.....	6	4	62
82	28	3	84	150	2	79	.....	6	4	63
77	28	4	79	159	2	82	.....	6	4	64
73	30	4	67	148	2	70	.....	6	4	65
$37,252	$27,505	$10,788	$37,879	$110,717	$5,701	$17,683	$4,393	$1,830	$9,865	66
$4,624	$4,176	$2,640	$16,521	$35,932	$1,470	$7,715	$1,400	$480	$1,220	67
$1,255	$5,392	$74	$1,458	$803	$68	$1,283	.....	$58	$209	68
$26,753	$17,777	$7,874	$19,900	$63,322	$4,168	$8,555	$2,993	$1,292	$8,388	69
$4,620	$160	$200	.....	$10,600	.....	$180	.....	.....	$48	70
$196,842	$287,835	$26,679	$398,616	$943,432	$20,946	$403,106	$9,040	$18,751	$48,804	71
$162,545	$193,278	$22,283	$353,452	$859,698	$18,204	$372,631	$8,170	$13,788	$31,852	72
$7,698	$7,180	$1,273	$4,920	$7,665	$25	$1,861	$60	$1,344	$3,252	73
$5,434	$1,539	$177	$5,342	$11,733	$770	$4,770	$300	$396	$488	74
$6,981	$4,705	$257	$2,287	$7,673	$90	$1,783	$200	$303	$4,691	75
$8,850	$27,403	$2,194	$29,593	$41,746	$1,515	$11,542	$310	$2,162	$4,984	76
$5,434	$3,730	$495	$3,022	$14,917	$342	$10,519	.....	$758	$3,587	77
$866,538	$681,081	$85,449	$1,025,544	$2,371,196	$58,873	$999,355	$38,589	$63,125	$172,611	78
1,268,383	2,127,345	97,060	2,155,025	6,779,482	128,372	2,963,664	114,200	69,450	638,953	79
$395,815	$674,655	$43,896	$979,823	$2,298,796	$57,508	$849,978	$29,029	$33,434	$134,741	80
.....	.....	1,520	.....	32,280	.....	260,880	.....	.....	.....	81
.....	.....	$547	.....	$19,366	.....	$116,988	.....	.....	.....	82
.....	584,810	6,125	170,000	150,000	12,000	172,344	2,000	.....	15,150	83
.....	$231,562	$2,205	$43,000	$64,000	$1,500	$49,344	$1,000	.....	$3,030	84

TABLE 11.—BUTTONS,

		United States.	California.	Connecticut.	Illinois.
	Products—Continued.				
	Aggregate value—Continued.				
	Buttons—Continued.				
	Total value—Continued.				
	Composition:				
85	Gross	2,407,319	.....	.....	.....
86	Value	$246,410	.....	.....	.....
	Horn:				
87	Gross	717,047	.....	306,867	.....
88	Value	$237,874	.....	$173,405	.....
	Metal:				
	Brass:				
89	Gross	3,713,144	.....	2,995,784	.....
90	Value	$739,922	.....	$449,373	.....
	All other metal:				
91	Gross	1,046,527	.....	377,100	15,000
92	Value	$147,599	.....	$17,913	$22,000
	Pearl, fresh-water:				
93	Gross	4,308,584	.....	.....	137,000
94	Value	$1,176,285	.....	.....	$37,500
	Pearl, ocean:				
95	Gross	4,049,452	.....	.....	4,800
96	Value	$1,951,558	.....	.....	$7,400
	Vegetable ivory:				
97	Gross	2,661,823	470	744,467	.....
98	Value	$1,144,677	$1,000	$160,127	.....
	All other kinds:				
99	Gross	680,072	.....	12,000	5,555
100	Value	$217,526	.....	$4,000	$24,000
	Blanks, fresh-water pearl:				
101	Gross	5,432,246	.....	.....	630,943
102	Value	$656,036	.....	.....	$134,104
103	Value of all other products	$572,501	$1,620	$226,427	$6,700
	Comparison of products:				
104	Number of establishments reporting for both years	154	4	10	10
105	Value for census year	$6,671,943	$6,870	$1,060,159	$181,038
106	Value for preceding business year	$5,492,921	$5,215	$1,020,879	$154,875
	Power:				
107	Number of establishments reporting	201	1	11	9
108	Total horsepower	4,235	1	546	121
	Owned:				
	Engines:				
	Steam:				
109	Number	70	.....	8	3
110	Horsepower	2,305	.....	310	91
	Gas or gasoline:				
111	Number	28	.....	.....	3
112	Horsepower	263	.....	.....	20
	Water wheels:				
113	Number	8	.....	3	.....
114	Horsepower	144	.....	45	.....
	Electric motors:				
115	Number	6	.....	3	.....
116	Horsepower	70	.....	55	.....
	Other power:				
117	Number	1	.....	.....	.....
118	Horsepower	25	.....	.....	.....
	Rented:				
119	Electric horsepower	117	1	20	.....
120	All other horsepower	1,811	.....	116	10
121	Furnished to other establishments, horsepower	99	.....	.....	.....
	Establishments classified by number of persons employed, not including proprietors and firm members:				
122	Total number of establishments	238	5	11	14
123	No employees	1	1	.....	.....
124	Under 5	35	4	.....	1
125	5 to 20	78	.....	2	7
126	21 to 50	59	.....	4	4
127	51 to 100	37	.....	3	2
128	101 to 250	22	.....	1	.....
129	251 to 500	6	.....	1	.....

BY STATES: 1900—Continued.

Iowa.	Massachusetts.	Missouri.	New Jersey.	New York.	Ohio.	Pennsylvania.	Rhode Island.	Wisconsin.	All other states.	
.....	824,401	.....	.....	900,000	.....	1,182,918	.....	.....	.....	85
.....	$14,610	.....	.....	$106,000	.....	$125,800	.....	.....	.....	86
.....	410,180	.....	.....	.....	.....	.....	.....	.....	.....	87
.....	$64,469	.....	.....	.....	.....	.....	.....	.....	.....	88
.....	.....	.....	369,160	282,000	.....	.....	47,200	.....	19,000	89
.....	.....	.....	$45,820	$216,200	.....	.....	$23,029	.....	$6,500	90
.....	.....	.....	492,550	.....	.....	.....	.....	.....	161,877	91
.....	.....	.....	$85,727	.....	.....	.....	.....	.....	$21,959	92
1,268,383	110,000	55,500	60,700	1,757,865	84,961	688,865	.....	65,850	79,460	93
$395,815	$31,400	$11,439	$27,291	$897,383	$30,358	$191,462	.....	$29,907	$23,730	94
.....	10,000	.....	400,964	2,959,777	31,411	638,800	.....	3,600	.....	95
.....	$7,000	.....	$469,837	$1,083,335	$25,650	$354,809	.....	$3,627	.....	96
.....	622,000	6,125	580,651	690,110	.....	18,000	.....	.....	.....	97
.....	$292,280	$2,205	$271,153	$407,912	.....	$10,000	.....	.....	.....	98
.....	115,954	27,790	81,000	7,450	.....	1,857	65,000	.....	363,466	99
.....	$33,334	$27,500	$37,000	$5,600	.....	$1,570	$5,000	.....	$79,522	100
4,144,747	.....	343,300	.....	.....	.....	.....	.....	297,106	16,150	101
$467,351	.....	$23,090	.....	.....	.....	.....	.....	$29,691	$1,800	102
$8,372	$6,426	$18,463	$45,716	$72,400	$1,365	$149,382	$4,560	.....	$36,070	103
21	11	3	31	34	2	18	1	2	7	104
$531,912	$647,081	$50,920	$992,244	$2,040,245	$37,865	$968,271	$5,000	$12,527	$137,811	105
$396,867	$501,275	$43,600	$802,418	$1,562,929	$28,200	$839,184	$4,200	$12,000	$121,379	106
53	11	9	27	40	3	18	2	8	9	107
668	473	60	441	998	40	471	9	110	297	108
27	8	3	6	6	.....	3	.....	4	2	109
450	433	28	243	250	.....	181	.....	69	250	110
9	.....	3	3	3	.....	2	.....	2	3	111
50	.....	19	42	45	.....	40	.....	25	22	112
.....	1	.....	.....	3	.....	.....	.....	.....	1	113
.....	15	.....	.....	83	.....	.....	.....	.....	1	114
.....	2	.....	.....	1	.....	.....	.....	.....	.....	115
.....	10	.....	.....	5	.....	.....	.....	.....	.....	116
.....	.....	.....	.....	1	.....	.....	.....	.....	.....	117
.....	.....	.....	.....	25	.....	.....	.....	.....	.....	118
67	.....	7	.....	2	10	4	.....	1	5	119
101	15	6	156	588	30	246	9	15	19	120
.....	65	.....	4	10	.....	.....	.....	.....	20	121
53	13	11	34	49	4	21	3	9	11	122
6	4	1	6	5	.....	2	1	2	3	124
17	2	8	9	14	1	8	1	4	5	125
17	5	2	9	7	3	4	1	3	.....	126
8	.....	.....	6	12	.....	3	.....	.....	3	127
5	.....	.....	4	9	.....	3	.....	.....	.....	128
.....	2	.....	.....	2	.....	1	.....	.....	.....	129

O