

X.—AGRICULTURE.

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In General.—Agriculture is far the most important industry of the United States, employing, as it does, fully one-fourth of the wealth of the country, and contributing about that proportion of the total industrial product. The capital invested in farms and farming implements in 1880 was \$10,603,616,831, while that invested in manufactures, the next largest industry, was \$2,790,272,606. In the magnitude of its agricultural product, the United States holds the first place among the nations. According to Mulhall, it produces 30 per cent. of the grain of the world, which is considerably more than the product of any other country.

Farms.—The area in farms in 1880, comprised 837,628 square miles, or 28.2 per cent. of the total area of the United States, exclusive of Alaska.

The improved land was 444,955 square miles, or 15 per cent. of the total area. The following table shows the acreage of farms and improved land, together with the number and average size of farms, at the date of each census mentioned:

	1880.	1870.	1860.	1850.
Total acres in farm..	536,081,835	407,735,041	407,212,538	293,560,614
Acres improved.....	284,771,042	188,921,099	163,110,720	113,032,614
Number of farms....	4,008,907	2,659,985	2,044,077	1,449,073
Average size of farms	134	153	199	203

The ratios of increase deducible from the above, are as follows:

	PERCENTAGE OF INCREASE.		
	1870-1880.	1860-1870.	1850-1860.
Total land in farms.....	31	0	38
Improved land.....	51	16	44
Number of farms.....	51	30	41

Between 1870 and 1880, the area of land in farms increased in a slightly greater ratio than population, the increase of the latter being 30.1 per cent. There was during this period a great westward movement of the population into the Cordilleran region, a thin film, as it were, of population spreading itself over a vast area

hitherto unsettled. In the same time, the area of improved land increased one-half, an increase largely in excess of that of the total acreage in farms, and due to the bringing under cultivation of a large proportion of the unimproved farm lands, held in 1870. The increase of 51 per cent. in the number of farms was greater than during any previous decade, and considerably in excess of the increase of farm acreage, thus explaining the decrease in the average size of farms, shown in the preceding table.

The decade from 1860 to 1870 shows the effect of the Civil War in the non-increase of the area in farms, attended by an increase of 30 per cent. in their number, and a corresponding decrease in their average size. The increase of improved land did not keep pace with that of population, that in the number of farms was notably less than in either the preceding or the following decade, and the diminution of 46 acres in the average size of farms was much greater than in any other similar period.

The social and commercial conditions developed by the war tended to a division of the homesteads and plantations in the older states. This tendency was by no means overcome in the decade from 1870 to 1880, as is shown by the further diminution of 19 acres (23 per cent.), in the average size of farms, notwithstanding the increase of 31 per cent. in the total farm area, made up largely of newly settled Western and Southern lands, generally held in large tracts.

Number of Farms.—An examination in detail of the increase in the number of farms develops many interesting features. The accompanying table shows, by states, and by sections, the number of farms in 1870 and 1880, with the percentage of increase during the decade, both in number and total area of farms.

While the rate of increase in the North Atlantic states, the manufacturing section, was far below the average for the country, and that in the Northern Central section was almost precisely equal to the average, the increase in both the Southern sections, and in the Western group, greatly exceeded that for the country at large. In the case of the two Southern sections, the increase in the number of farms was due to two causes, the extension of the farm area and the sub-dividing of the great farms and plantations existing prior to the Civil War, the latter being the chief cause, especially in the South Atlantic states. In the West, the addition to the number of farms was, in the main, due to the extension of the farm area.

The last two columns of the table show approximately the relative effect of the extension of farm area and of the subdivision of farms in increasing their number, and consequently decreasing their average size:

STATES AND TERRITORIES.	TOTAL NUMBER OF FARMS.		PER CENT. OF INCREASE.	
	1880.	1870.	IN NUMBER OF FARMS.	IN TOTAL FARM AREA.
The United States...	4,008,907	2,659,985	50.7	31.5
North Atlantic Group.				
Maine.....	64,309	59,804	7.5	12.2
New Hampshire....	32,181	29,642	8.6	3.2
Vermont.....	35,522	33,827	5.0	7.8
Massachusetts.....	38,406	26,500	44.9	23.0
Rhode Island.....	6,216	5,368	15.8	2.5
Connecticut.....	30,598	25,508	20.0	3.8
New York.....	241,058	216,253	11.5	7.2
New Jersey.....	34,307	30,652	11.9	2.0
Pennsylvania.....	213,542	174,041	22.7	10.0
The Group.....	696,139	601,595	15.7	8.4
South Atlantic Group.				
Delaware.....	8,749	7,615	14.9	3.6
Maryland.....	40,517	27,000	50.1	13.5
District of Columbia.	435	209	108.1	55.4
Virginia.....	118,517	73,849	60.5	9.3
West Virginia.....	62,674	39,778	57.6	19.5
North Carolina.....	157,609	93,565	68.4	12.7
South Carolina.....	93,864	51,889	80.9	11.2
Georgia.....	138,626	69,956	98.2	10.1
Florida.....	23,438	10,241	128.9	38.9
The Group.....	644,429	374,102	72.3	12.4
Northern Central Group.				
Ohio.....	247,189	195,953	26.1	13.0
Indiana.....	194,013	161,289	20.3	12.7
Illinois.....	255,741	202,803	26.1	22.4
Michigan.....	154,008	98,786	55.9	37.8
Wisconsin.....	134,322	102,904	30.5	31.1
Minnesota.....	92,386	46,500	98.7	106.7
Iowa.....	185,351	116,292	59.4	59.3
Missouri.....	215,575	148,328	45.3	28.4
Dakota.....	17,435	1,720	913.7	1,156.9
Nebraska.....	63,387	12,301	415.3	379.6
Kansas.....	138,561	38,202	262.7	278.6
The Group.....	1,697,968	1,125,078	50.9	48.7
Southern Central Group.				
Kentucky.....	166,453	118,422	40.6	15.2
Tennessee.....	165,650	118,141	40.2	5.5
Alabama.....	135,864	67,382	101.6	26.0
Mississippi.....	101,772	68,023	49.6	20.8
Louisiana.....	48,292	28,481	69.6	17.8
Texas.....	174,184	61,125	184.9	97.3
Arkansas.....	94,433	49,424	91.1	58.8
The Group.....	886,648	510,998	73.5	34.4
Western Group.				
Montana.....	1,519	851	78.5	190.7
Wyoming.....	457	175	161.1	2,766.5
Colorado.....	4,506	1,738	159.3	263.8
New Mexico.....	5,053	4,480	12.8	24.3
Arizona.....	767	172	345.9	521.7
Utah.....	9,452	4,908	92.6	341.8
Nevada.....	1,404	1,036	35.5	154.6
Idaho.....	1,885	414	355.3	324.9
Washington.....	6,529	3,127	108.8	117.1
Oregon.....	16,217	7,587	113.7	76.4
California.....	35,934	23,724	51.5	45.2
The Group.....	83,723	48,212	73.7	61.5

Area in Farms.—The highest average of farm area is in Ohio, where 94 per cent. of the total area is in farms, leaving, it would appear, scarcely sufficient land for roads, railways and cities. The neighboring states of Indiana and Illinois stand next in rank. The ratio of the Northern Central group is, however, lowered by the border states, so that the North Atlantic section has the highest proportion. Of these, but one state, Maine, has less than 60 per cent. of its total area in farms.

Of the total area in farms (536,081,835 acres), 53.1 per cent., or 284,771,042 acres, was returned as "improved" and 46.9 per cent. as unimproved. The "improved" area was divided into two classes: tilled land, including fallow land, and that sown with grass in rotation of crops, comprising 223,067,144 acres, and, secondly, permanent meadows, pastures, orchards and vineyards, comprising 61,703,898 acres. The "unimproved" area was also divided into two classes: woodland and forest, which comprised three-fourths of the unimproved land, or 190,254,744 acres, and "other unimproved" land, in which was included the remainder, amounting to 61,055,049 acres.

Average Size of Farms.—The average size of farms in 1880 was 134 acres; the average number of acres of improved land was 71, and of unimproved land, 63. Of the improved land, the average number of acres of tilled land was 56; of permanent meadows and pastures, orchards and vineyards, 15. The average number of acres of woodland and forest, per farm, was 47.5, and of other unimproved land, 15.5.

The following table classifies the farms of the country, according to size, and gives the number of each class in the years 1860, 1870 and 1880, respectively, with the percentage which each formed of the total number of farms:

ACRES IN FARMS.	1880.		1870.		1860.	
	NUMBER.	PER CENT.	NUMBER.	PER CENT.	NUMBER.	PER CENT.
Under 3.....	4,352	0.1	6,875	0.3		
3 and under 10....	134,889	3.4	172,021	6.5	54,676	2.8
10 and under 20....	254,749	6.4	294,607	11.1	162,178	8.3
20 and under 50....	781,474	19.5	847,614	31.9	616,558	31.5
50 and under 100....	1,032,910	25.7	754,221	28.4	608,878	31.1
100 and under 500..	1,695,983	42.3	565,054	21.2	487,041	24.9
500 and under 1,000.	75,972	1.9	15,873	0.5	20,319	1.0
1,000 and over.....	28,578	0.7	3,720	0.1	5,364	0.3

In 1880, farms of between 100 and 500 acres formed much the largest class, while in both 1870 and 1860, this prominence belonged to those of between 20 and 50 acres.

Tenure of Farms.—An inquiry was made in 1880, for the first time, into the tenure of farms, whether cultivated by their owners, rented, or worked upon shares.

ACRES IN FARMS.	WORKED BY OWNERS.		RENTED.		WORKED ON SHARES.	
	NUMBER.	PER CENT.	NUMBER.	PER CENT.	NUMBER.	PER CENT.
Under 3.....	2,601	60	875	20	876	20
3 and under 10....	85,456	63	22,904	17	26,529	20
10 and under 20....	122,411	48	41,522	16	90,816	36
20 and under 50....	460,486	59	97,399	13	223,689	28
50 and under 100..	804,522	78	69,663	7	158,625	15
100 and under 500..	1,416,618	84	84,645	5	194,720	11
500 and under 1,000.	66,447	87	3,956	5	5,569	8
1,000 and over....	25,765	90	1,393	5	1,420	5

The result of this inquiry, given in the preceding table, corroborates the current belief

that the greater number of farms in this country are of the first class. Of the 4,008,907 farms returned, 2,984,306, or 74 per cent. were cultivated by their owners; 322,357, or 8 per cent., were rented, and 702,244 were cultivated on shares.

The table shows, in general, an increase in proportion of ownership, corresponding with increased size of farms. The custom of renting on shares has its greatest relative development in those of from 10 to 50 acres. Both above and below this point, the number of rented farms decreases. Those most frequently rented for money are the smallest farms, and their number steadily decreases with an increase in acreage.

In the North and West, by far the greater proportion of the farms are cultivated by their owners, and only in the South, the system of renting, especially for a share in the proceeds, prevails to any great extent. This system has grown up since the war, with the sub-division of the great plantations. Most of these rented farms are cultivated by the colored element.

Value of Farms.—The value of farms in 1880 was \$10,197,096,776, or nearly one-fourth of the total valuation of the country. In 1870, it was \$9,262,803,861, or, reduced to gold, \$7,410,243,089, showing an increase during the decade of 37.6 per cent., but 7.6 per cent. greater than that of population. The increase from 1860 to 1870 was less than that of population. From 1850 to 1860, the value of farms more than doubled, while population increased 35.6 per cent.

The gross value of farms is greatest in Ohio, New York follows, then Illinois, and Pennsylvania. The value per acre ranges highest in the densely populated states of the North Atlantic group, gradually decreasing westward throughout the Northern Central group. Southward, the value decreases greatly, the lands of the cotton states barely averaging five dollars per acre, with the improvements.

The highest value per acre accompanies the densest population, the largest proportion of urban population, and the greatest relative importance of manufactures and other industries. In other words, the greater the propor-

tional number of inhabitants dependent upon other industries than agriculture, the greater the value of agricultural property, consequent, of course, upon the higher prices resulting from

Farming Implements and Machinery.—The value of farming implements and machinery in 1880 was \$406,520,055. There are probably few branches of manufactur-

ing in which greater advances have been made during recent years than in agricultural machinery, which is used in no other country so generally as in the United States.

This widespread use of machinery in farming is due partly to American fertility of invention, partly to the large areas in farms, which readily allow or, on account of scarcity of laborers, require the substitution of steam or animal power for manual labor, and partly to the readiness with which the American farming class adopt new methods.

On the other hand, the general introduction of farming machinery has had a potent influence in bringing within the area of tillage vast tracts in sparsely settled regions, the cultivation of which would be impossible without such aid. It has thus been at once an effect and a cause of the great increase in farm area and in the number of farms, already set forth in the preceding tables.

The value of farming tools and machines, and the percentage of increase at each decade since 1850, are presented in the table below:

CENSUS.	FARMING TOOLS AND MACHINES.	PERCENTAGE OF INCREASE.
1880.....	\$406,520,055	50.8
1870.....	336,878,429	9.5
1860.....	246,118,141	62.3
1850.....	151,587,638

The value given above for 1870 is the value in paper currency, as given in the Census Report. In computing the percentage of increase, this has been reduced to a gold standard, making the amount \$269,502,743. The small increase between 1860 and 1870 was of course due to the effects of the Civil War.

Value of Farm Products.

—The total value of all farm products was returned for the first time by the Census of 1870, as \$2,447,538,658 in paper, or in gold, about \$1,958,030,926. In 1880 it was returned as \$2,212,540,927, an apparent increase of 13 per cent. only, notwithstanding an enormous

Farm Area, Tenure and Value.

The subjoined table shows, by states and groups of states, (1) the area in farms, with the percentage which this forms of the total area, (2) the proportions held under different forms of tenure, expressed in percentages of the whole number of farms, and (3) the total value and the value per acre, including improvements.

STATES AND TERRITORIES.	AREA IN FARMS.		TENURE. (PERCENTAGE OF FARM AREA.)			VALUE OF FARMS.	
	ACRES.	PERCENTAGE OF TOTAL AREA.	WORKED BY OWNERS.	RENTED.	WORKED ON SHARES.	TOTAL.	PER ACRE.
The United States..	536,081,835	15.0	74.44	8.04	17.52	\$10,197,096,776	\$19.21
North Atlantic Group.							
Maine.....	6,552,578	34.2	95.68	2.53	1.79	102,357,615	15.61
New Hampshire....	3,721,173	64.6	91.88	3.84	4.28	75,834,389	20.38
Vermont.....	4,882,588	83.5	86.60	6.09	7.31	109,346,010	20.40
Massachusetts... ..	3,359,079	65.3	91.82	5.97	2.21	146,197,415	43.52
Rhode Island.....	514,813	74.1	80.12	15.91	3.97	25,882,079	50.27
Connecticut.....	2,453,541	79.1	89.78	6.28	3.94	121,063,910	49.35
New York.....	23,780,754	78.0	83.46	7.52	9.02	1,056,176,741	44.41
New Jersey.....	2,929,773	61.4	75.40	10.52	14.08	190,895,833	65.15
Pennsylvania.....	19,791,341	68.7	78.78	7.98	13.24	975,689,410	49.30
The Group....	67,985,640	65.4	84.01	7.04	8.95	\$2,403,443,402	34.34
South Atlantic Group.							
Delaware.....	1,090,245	86.9	57.62	5.84	36.54	\$36,789,672	33.74
Maryland.....	5,119,831	81.1	69.05	9.57	21.38	165,503,341	32.33
District of Columbia..	18,146	47.3	61.84	34.48	3.68	3,632,403	200.18
Virginia.....	19,835,785	77.2	70.48	11.30	18.22	216,028,107	10.89
West Virginia.....	10,193,779	64.6	80.85	6.85	12.30	133,147,175	13.06
North Carolina....	22,363,558	71.9	66.55	5.48	27.97	135,793,602	6.07
South Carolina....	13,457,613	69.7	49.69	23.41	26.90	68,677,482	5.10
Georgia.....	26,043,282	69.0	55.15	13.39	31.46	111,910,540	4.30
Florida.....	3,297,324	9.5	69.11	15.14	15.75	20,291,835	6.15
The Group....	101,419,363	60.0	63.88	11.63	24.49	\$891,774,157	8.79
Northern Central Group							
Ohio.....	24,529,226	94.0	80.73	6.00	13.27	\$1,127,497,353	46.37
Indiana.....	20,420,983	88.9	76.27	4.42	19.31	635,236,111	31.11
Illinois.....	31,673,645	88.4	68.62	8.06	23.32	1,009,594,580	31.56
Michigan.....	13,807,240	37.6	89.99	3.26	6.75	499,103,181	36.15
Wisconsin.....	15,353,118	44.1	90.95	2.77	6.28	357,709,507	23.30
Minnesota.....	13,403,019	26.4	90.85	1.35	7.80	193,724,260	14.45
Iowa.....	24,752,700	69.7	76.17	4.54	19.29	567,430,227	22.92
Missouri.....	27,879,276	63.4	72.69	9.21	18.10	375,633,307	13.47
Dakota.....	3,800,656	4.0	96.11	0.41	3.48	22,401,084	5.89
Nebraska.....	9,944,826	20.4	81.98	3.07	14.95	105,932,541	10.64
Kansas.....	21,417,468	41.0	83.65	3.20	13.15	235,178,936	10.98
The Group....	206,982,157	42.8	79.52	5.23	15.25	\$4,126,441,087	18.99
Southern Central Group							
Alabama.....	18,855,334	57.2	53.15	16.85	30.00	\$78,954,648	4.19
Mississippi.....	15,855,462	53.5	56.22	17.14	26.64	92,844,915	5.23
Louisiana.....	8,273,506	28.5	64.78	13.81	21.41	58,989,117	7.12
Texas.....	36,292,219	21.6	62.41	6.94	30.65	170,468,886	4.97
Arkansas.....	12,061,547	35.5	69.09	20.50	20.41	74,249,655	6.16
Tennessee.....	20,666,915	77.3	65.47	11.63	22.90	206,749,837	10.00
Kentucky.....	21,495,240	84.0	73.55	10.11	16.34	299,298,631	13.92
The Group....	133,500,223	38.6	63.79	11.85	24.36	\$991,555,689	7.35
Western Group.							
Montana.....	405,683	0.4	94.73	1.12	4.15	\$3,234,504	7.97
Wyoming.....	124,433	0.2	97.16	1.09	1.75	835,895	6.72
Colorado.....	1,165,373	1.8	87.04	3.66	9.30	25,109,223	21.55
New Mexico.....	631,131	0.8	91.93	0.43	7.64	5,514,399	8.74
Arizona.....	135,573	0.2	86.83	5.48	7.69	1,127,946	8.32
Utah.....	655,524	1.2	95.42	0.63	3.95	14,015,178	21.36
Nevada.....	530,862	0.8	90.31	4.49	5.20	5,408,325	10.19
Idaho.....	327,798	0.6	95.28	1.70	3.02	2,832,890	8.64
Washington.....	1,409,421	3.3	92.79	3.20	4.01	13,844,224	9.82
Oregon.....	4,214,712	7.0	85.95	4.57	9.48	56,908,575	13.50
California.....	16,593,742	10.6	80.17	8.93	10.90	262,051,282	15.79
The Group....	26,194,452	3.5	86.01	5.45	8.54	\$400,881,441	15.31

the greater demand for farm products, and their more complete utilization. Much that is waste in a sparsely settled agricultural region, has a commercial value in cities and towns. Straw, burned as of no value in one place, sells readily where population is denser.

increase during the decade in the quantity of cereals, cotton, and, in short, of nearly all the principal items of production. The explanation of the relatively small value of the vastly increased product of 1880, is found, manifestly, in the sweeping reduction of prices as compared with those of 1870.

The Cereals.—In the production of the six principal cereals the United States stands first among the nations of the globe. This is true not only as to total production, but also as to product per inhabitant. Naturally, also, this country has the largest surplus above the requirements of its population, and makes the largest contribution toward supplying the deficiencies of other nations.

The following table, extracted from Mulhall's "Progress of Nations," shows the acreage cultivated and the production of grain in the principal countries of the world:

COUNTRIES.	ACRES UNDER GRAIN.	PRODUCTION. (BUSHEL.)
United States.....	118,000,000	2,698,000,000
Russia.....	158,000,000	1,585,000,000
Germany.....	43,000,000	990,000,000
France.....	40,000,000	840,000,000
Austro-Hungary.....	35,000,000	520,000,000
United Kingdom.....	12,500,000	455,000,000
Spain.....	15,000,000	300,000,000
Italy.....	18,000,000	270,000,000
Canada and Australia.....	14,000,000	140,000,000

The total amount of the cereal crop, as reported by the Censuses of 1880, 1870, 1860 and 1850, the percentage of increase from decade to decade, and the number of bushels per capita of population are presented in the table below:

CENSUS.	PRODUCT IN BUSHEL.		PERCENTAGE OF INCREASE OVER PRECEDING DECADE.
	TOTAL.	PER CAPITA.	
1880.....	2,697,580,229	53.79	94.5
1870.....	1,387,299,153	35.98	12.0
1860.....	1,239,039,947	39.40	42.8
1850.....	867,453,967	37.40

The gain in production of cereals was considerably greater than that of population between 1850 and 1860. Between 1860 and 1870 there was a relative decrease, while in the last decade the percentage of increase was over three times that of population.

This production was distributed as follows:

GRAIN.	ACRES.	PRODUCTION. (BUSHEL.)
Corn.....	62,368,869	1,754,591,676
Wheat.....	35,430,052	459,483,137
Oats.....	16,144,593	407,858,999
Barley.....	1,997,717	43,997,495
Rye.....	1,842,303	19,831,595
Buckwheat.....	848,389	11,817,327
Total.....	118,631,923	2,697,580,229

It is generally considered that the greater the food production of a country, the greater is the quantity consumed per capita. Various estimates have been made of the consumption of grain per capita in different countries. That of Mulhall ("Balance Sheet of the World") is given below, together with his estimate of the per capita production of grain:

COUNTRIES.	PRODUCTION PER CAPITA. (BUSHEL.)	CONSUMPTION PER CAPITA. (BUSHEL.)
Austria.....	14.35	13.57
Denmark.....	36.80	30.83
France.....	19.94	24.02
Germany.....	21.15	23.71
Great Britain.....	11.90	20.02
Holland.....	12.50	16.25
Italy.....	9.45	9.62
Russia.....	20.22	17.97
Spain.....	17.98	17.68
Europe.....	16.50	17.66
Canada.....	40.30	38.11
United States.....	48.10	40.66

It will be observed that this estimate of the production of the United States is considerably less than the actual product per capita in 1880, and greater than any previous production.

The annual export of corn, wheat and wheat flour for the years 1860-1880 is shown by diagrams on Plates 98, 100 and 119.

Indian Corn.—The production of corn reported by the last four censuses, shows a rapid increase, except in 1870, even in proportion to the population:

CENSUS.	PRODUCTION. (BUSHEL.)	PRODUCTION PER CAPITA. (BUSHEL.)
1880.....	1,754,591,676	35
1870.....	760,944,549	19
1860.....	838,792,742	27
1850.....	592,071,104	25

The low production of 1870 was due in part to the war, in part to an unfavorable season for this crop.

The corn crop of 1879, reported by the last census, was 1,754,591,676 bushels, an average of 35 bushels for every man, woman and child in the country. The average product per acre was 28 bushels, the area planted with this crop being 62,368,869 acres (97,450 square miles), or about one-thirtieth of the total area of the country.

This peculiarly American grain, although by preference a semi-tropical plant, is the most widely distributed throughout the country of all the cereals. It is cultivated from the Gulf to the British boundary, and from the Atlantic to the Pacific. The one condition that it requires for maturing its grain is a hot summer, and this our continental climate assures. There are, it

is true, areas in the Cordilleran region at so great an elevation that the summer is too cool and short for it, but these are of small importance in the present stage of its cultivation, as comparatively little farming is carried on there.

The great corn region of the United States is the Northern Central section, which, in 1879, produced 73 per cent. of the whole crop. Six states of this group, viz.: Illinois, Iowa, Missouri, Indiana, Ohio and Kansas, produced more than 100,000,000 bushels each. The highest production of any state outside of this section was that of Kentucky, which raised nearly 73,000,000 bushels. The proportion grown in New England is small, yet it is the most important of all the cereal crops of this region. In the South it is, next to cotton, the most important crop, except in those areas devoted to rice and the sugar cane; still the South raises but a small proportion of the crop of the country.

Not only are the Northern Central states the great corn region, as regards absolute production, but here also, the production per acre is the greatest, averaging about 35 bushels, while elsewhere it is less than 25 bushels. In the Southern states the yield is particularly low, having an average only of between 10 and 15 bushels in states along the Gulf coast.

The most favorable latitude, for the cultivation of this cereal, all conditions considered, appears to be between the 40th and 41st parallels, in which strip of country, 20.2 per cent. of the whole crop was raised. Between the 39th and 42d parallels, not less than 54.8 per cent. of the crop was produced, while northward and southward the amount diminished.

Distributing the production of corn, according to elevation above sea-level, it appears that over 54 per cent. is produced where the elevation ranges between 500 and 1,000 feet, and 82 per cent. between 500 and 1,500 feet. Above the latter elevation there is raised only 4.4 per cent., and only about one-eighth of the crop below 500 feet.

Considered with respect to temperature, this cereal affects the colder rather than the warmer parts of the country. Where the annual temperature ranges between 45° and 50° Fah., there is raised 40.8 per cent of the crop; between 45° and 55°, there was grown 75.9 per cent., and 87.3 per cent. between the isotherms of 45° and 60°.

Corn needs abundant moisture. This is shown by the fact that 63.4 per cent. of the crop was grown where the annual rainfall ranges from 35 to 45 inches, and 86.8 per cent. where it ranges from 30 to 50 inches.

Indeed, where the rainfall is less than 25 inches, only one-half of one per cent. was raised, and doubtless much, if not all of this, was grown only by the aid of irrigation.

For many years, Indian corn has been freely exported. The export, which reached a minimum in 1870, owing to the small crop, has since increased quite steadily and rapidly, as shown by the following table:

YEARS.	EXPORT OF INDIAN CORN. (BUSHEL.)	EXPORT OF CORN MEAL. (BARRELS.)
1870.....	1,392,115	187,093
1871.....	9,826,309	211,811
1872.....	34,491,650	308,840
1873.....	38,541,930	403,111
1874.....	34,434,606	387,807
1875.....	28,858,420	291,654
1876.....	49,493,572	354,240
1877.....	70,860,983	447,907
1878.....	45,461,098	432,753
1879.....	86,296,252	397,160
1880.....	98,169,877	350,613

Although the amount of exportation of corn indicates in a general way the magnitude of the crop, still it cannot be relied on to follow the latter with any degree of closeness. The expense attendant upon moving this bulky cereal, compared with its value, prevents it from seeking a market at a distance, and moreover, the grain is of itself more difficult than wheat to ship great distances in good order. Hence, an abundant crop does not produce a correspondingly large exportation. In this respect, the export of corn is a much less correct indicator of the size of the crop, than the export of wheat. The surplus is mainly used in feeding live-stock and as a raw material for various manufactured products, and an abundant crop of corn shows its effects in an increased product of live-stock.

Wheat.—The acreage in wheat reported by the Census of 1880 was 5,430,052, and the crop 459,483,137 bushels. The average yield per acre was about thirteen bushels. This acreage was 29.7 per cent. of all land cultivated in cereals, and the product was about 9.2 bushels per inhabitant. The following table presents the production of wheat, as reported by the different censuses since and including 1840, with the production per capita:

CENSUS.	PRODUCTION. (BUSHEL.)	PRODUCTION PER CAPITA. (BUSHEL.)
1880.....	459,483,137	9.2
1870.....	287,745,626	7.5
1860.....	173,104,924	5.6
1850.....	100,485,944	4.3
1840.....	84,823,272	5.0

These figures illustrate, not alone the remarkably rapid increase of absolute produc-

tion, but the increase in production per capita of population. Although the population has grown at a prodigious rate, yet the wheat production per capita, has more than doubled since 1850.

Glancing at the production by states (Plate 99), it is seen that the leading states are mainly those of the Northern Central section, where suitable soils, a favorable climate, and the conditions necessary for the use of farming machinery on a large scale, coupled with easy and cheap transportation to markets, combine to encourage wheat-growing. The leading wheat state is Illinois, which produces over 11 per cent. of the total product of the country. Then follow Indiana, Ohio, Michigan, Minnesota, Iowa, California, Missouri, Wisconsin and Pennsylvania, in the order mentioned. These ten states together produce three-fourths of the wheat crop of the country.

The states in which wheat is raised in largest quantities are not necessarily those in which the yield per acre is the greatest. In Illinois, whose product is the largest, the yield per acre is but 15.8 bushels; in Indiana about 18.4, and in Ohio 18 bushels. The small yield from the virgin soils of Dakota, Kansas and Nebraska, 10.6, 9.3 and 9.4 bushels per acre, respectively, is noticeable.

The highest production per acre was in the states and territories of the Cordilleran region, whose soils are likewise new to tillage, and where the necessity for irrigation results in the more careful cultivation of comparatively small farms. The lowest yield is found in the Southern states, whose soil and climate are not as well adapted to this crop as to others.

Distributing the wheat production according to latitude, it is found that 83.1 per cent. of the whole is raised between the 37th and the 44th parallels, and that much more than one-half, or 58.2 per cent., is cultivated in the area between the 38th and the 42d parallels.

More than one-half the crop, or 52.2 per cent., was grown at an elevation ranging from 500 to 1,000 feet above sea level, and nearly 78 per cent. of the whole crop between the limits of 500 and 1,500 feet elevation. Only 11.6 per cent. was raised below the level of 500 feet.

A distribution of the wheat production according to mean annual temperature, shows that where the temperature ranged from 50° to 55° the production was greatest—37.8 per cent. of the crop being in this belt. Nearly two-thirds of the crop was raised where the temperature was between 45° and 55°.

In respect to annual rainfall, five-eighths of the wheat crop (62.7 per cent.) was grown in

the region receiving from 35 to 50 inches, and over nine-tenths (92.4 per cent.) where the annual rainfall is above 25 inches. The small remaining portion (7.6 per cent.) was raised by the aid of irrigation, or in regions where the rainfall, though scanty, is mostly within the growing season. It is worthy of note that 48 per cent. of the crop was raised where the rainfall during the growing season is between 20 and 25 inches; nearly 80 per cent. where it is between 15 and 25; 6.4 per cent. where it is less than 15 inches, and only 1 per cent. with less than 10 inches of available rainfall.

The annual consumption of wheat is estimated at about 5.5 bushels per inhabitant. Of the total product of 9.2 bushels per capita in 1880, there was left, therefore, a very large surplus, amounting to about two-fifths of the crop, available for export. Of this surplus, which was in the neighborhood of 184,000,000 bushels, there was exported during the year 153,752,795 bushels of wheat, and 6,011,419 barrels of flour, having a total value of \$225,879,502. The annual exports of wheat and wheat flour fluctuated greatly during the decade, with a remarkable increase in its closing years, as is shown in the following table:

YEARS.	EXPORT OF WHEAT. (VALUE.)	EXPORT OF WHEAT FLOUR. (VALUE.)	TOTAL VALUE.
1871.....	\$45,143,424	\$24,093,184	\$69,236,608
1872.....	38,915,060	17,955,684	56,870,744
1873.....	51,452,254	19,381,664	70,833,918
1874.....	101,421,459	29,258,094	130,679,553
1875.....	59,607,863	23,712,440	83,320,303
1876.....	68,382,899	24,443,470	92,826,369
1877.....	47,135,562	21,663,947	68,799,509
1878.....	96,872,016	25,095,721	121,967,737
1879.....	130,701,079	29,567,713	160,268,792
1880.....	190,546,305	35,333,197	225,879,502

Oats.—The crop of this cereal in 1880 was 407,858,999 bushels, raised on 16,144,593 acres, an average per acre of a little over 25 bushels. The increase in the crop between 1870 and 1880 was 45 per cent.; between 1860 and 1870, over 63 per cent.; between 1850 and 1860, 18 per cent.

The region of the great lakes from New York and Pennsylvania to Minnesota, with the states of Iowa, Missouri, Kansas and Nebraska, constitute the area of greatest production. Nearly two-thirds of the whole crop was raised in the Northern Central section, and only a small portion in the Southern states, where it is not generally cultivated.

The geographic and climatic conditions most favorable to oats differ somewhat from those best suited for wheat, and in a still greater degree from those adapted to Indian corn. It bears a colder climate than either of

these cereals, or, at least, a cooler summer. More than half the crop is produced where the mean annual temperature is between 45° and 50° Fah. In respect to rainfall, it may be stated that four-fifths of the crop comes from a region where the annual rainfall is between 30 and 45 inches, and of the spring and summer between 15 and 25 inches. Over 91 per cent. of the crop was raised at elevations ranging from 100 to 1,500 feet above the sea.

The demand for oats as human food has been, until recent years, very slight; but latterly, large quantities have been used for this purpose. The export of oats is comparatively trifling, amounting to but a few hundred thousand bushels annually.

Barley.—The production of barley reported in the Tenth Census was 43,997,495 bushels. In 1870, it was reported as 29,761,305; in 1860, 15,825,898, and in 1850, 5,167,015. The ratios of increase, from decade to decade, were respectively as follows: from 1870 to 1880, 48 per cent.; from 1860 to 1870, 88 per cent., and from 1850 to 1860, no less than 206 per cent. The number of acres under cultivation in this crop in 1880 was 1,997,717, showing an average yield per acre of about 22 bushels.

The leading state in the production of barley is California, which in 1880 raised about 28½ per cent. of the whole product of the country. Then followed New York with 18 per cent. of the whole product, Wisconsin with 11 per cent., and Iowa with 9 per cent. The production of the Southern and the New England states was trifling, while that of several of the Western states and territories was, in proportion to their population, very large.

Rye.—The product of rye in the United States in 1880 was 19,831,595 bushels, on an acreage of 1,842,303, an average per acre of nearly 11 bushels. The increase over the product reported in 1870, which was 16,918,795 bushels, was 17 per cent. The largest crop reported by any census was that of 1860, which amounted to 21,101,380 bushels. In 1850, the production was reported as 14,188,813 bushels. Nearly 80 per cent. of the crop of 1880 was grown in Pennsylvania, Illinois, New York, Wisconsin and Iowa.

Buckwheat.—This minor cereal has never been a crop of much relative importance in this country. In 1880, it was reported at 11,817,327 bushels. This was a gain of 20 per cent. over 1870, when the crop was reported at 9,821,721 bushels. The crop reported in 1860 was 17,571,818 bushels, being by far the

largest reported at any census. That of 1850 was but 8,956,912 bushels, or less than one-half as large.

The states of New York and Pennsylvania together produced about two-thirds of the whole crop. The amounts produced in other single states are but trifling in comparison, and in a few states no production whatever was reported.

Hay.—This is one of the most valuable, if not the most valuable crop produced in the United States. Even at a very moderate valuation per ton, it reaches an aggregate value surprisingly near that of the wheat crop. The amount cut in 1880 was 35,205,712 tons, which was raised upon 30,631,054 acres, an average yield of 1.15 tons per acre. The greatest amount, as well as the greatest yield per acre, is from the Northern states, the importance of the crop diminishing southward. Thirteen states, all of them Northern states, had more than a million acres each in grass, and all but two of these averaged more than a ton of hay per acre. The largest production per acre was in Minnesota, whose average was 1.55 tons.

Irish Potatoes.—The farm product of this vegetable was 169,458,539 bushels, an average of about 3½ bushels to each inhabitant. The actual product of potatoes is greater than the above figures, a large aggregate being grown in gardens, outside of farm statistics. This crop is very generally distributed over the country, being raised in considerable quantities in every state and territory. Generally speaking, the product of the Northern states was considerably greater, in proportion to the population, than that of the South. New York, the leading producer, raised nearly one-fifth of the whole, while Pennsylvania, Ohio, Michigan and Illinois followed in the order named, each state having a product of more than ten million bushels.

Sweet Potatoes.—The production of sweet potatoes is mainly confined to the South. Of the total product in the United States of 33,378,693 bushels, 88 per cent. was raised in the South Atlantic and Southern Central states. The largest production was in the States of North Carolina and Georgia, which jointly contributed more than one-fourth of the entire product. The importance of the crop has very greatly increased during recent years, but it has not yet reached the proportions which it had prior to the war.

Rice.—The cultivation of rice is confined within very narrow geographical limits. The

whole crop is raised in the low coast swamps, upon the South Atlantic and Gulf coasts. Of the total product in 1880, 101,131,373 pounds, or nearly one-half, was grown on the coast of South Carolina; nearly one-fourth came from the Georgia coast, and most of the remainder from Louisiana. Prior to the war, the production of rice was rapidly diminishing. In 1850, there was raised more than 215,000,000 pounds. In 1860, this had fallen to about 187,000,000, and in 1870, it had still further decreased to 73,635,021 pounds. During the decade, ending with 1880, rice-growing apparently commenced to recover its lost ground.

Hops.—Although not confined by climatic causes, the production of hops has a narrow range. The state of New York produced four-fifths of all grown in the country, and Wisconsin and California most of the remainder. The total product was 26,546,378 pounds, a slight increase over that reported in 1870.

Sugar and Molasses.—The products of the sugar cane, sorghum and maple sap in 1880 were as follows:

SUGAR CANE :

Sugar.....178,872 hogsheads.
Molasses..... 16,573,273 gallons.

SORGHUM :

Sugar.....12,792 pounds.
Molasses.....28,444,202 gallons.

MAPLE SAP :

Sugar.....36,576,071 pounds.
Molasses..... 1,796,048 gallons.

The production of cane sugar is confined almost entirely to the lower half of Louisiana. That state produced in 1880 not less than 171,706 hogsheads, the remainder coming from Texas, Florida and Georgia.

The production of sorghum molasses was more evenly distributed, five states, viz.: Missouri, Tennessee, Kentucky, Illinois and Iowa each producing 2,000,000 gallons and upwards.

The maple sugar product is mainly confined to the Northern states. The six states which produced 2,000,000 pounds or more each, of sugar, were Vermont (11,261,077 pounds), New York (10,693,619 pounds), Michigan, Ohio, Pennsylvania and New Hampshire.

Cotton.—The cotton crop of the country during the census year (the crop of 1879), was reported as 5,755,359 bales, having an average weight of 475 lbs., and a value roughly estimated at nearly \$300,000,000. This was the largest crop ever raised. In 1870, it was reported by the Census at 3,011,996 bales; in 1860, 5,387,052, and in 1850, 2,469,093 bales.

Commercial reports of the cotton crop of the United States have been made up for each year since 1829, with the exception of the war period, between 1861 and 1865. The year in each case ends with September 1, and the crop referred to is evidently that grown during the previous year. They are presented in the following table:

YEAR.	BALES.	YEAR.	BALES.	YEAR.	BALES.	YEAR.	BALES.
1829	870,415	1841	1,634,945	1853	3,262,882	1869	2,439,039
1830	976,845	1842	1,683,574	1854	2,930,027	1870	3,154,946
1831	1,038,848	1843	2,378,875	1855	2,847,339	1871	4,352,317
1832	987,487	1844	2,030,409	1856	3,527,845	1872	2,974,351
1833	1,070,438	1845	2,394,503	1857	2,939,519	1873	3,930,508
1834	1,205,324	1846	2,100,537	1858	3,113,962	1874	4,170,388
1835	1,254,328	1847	1,778,651	1859	3,851,481	1875	3,832,991
1836	1,360,752	1848	2,347,634	1860	4,669,770	1876	4,669,288
1837	1,422,930	1849	2,728,596	1861	3,656,006	1877	4,485,423
1838	1,801,497	1850	2,096,706	1866	2,193,987	1878	4,811,265
1839	1,360,532	1851	2,355,257	1867	2,019,774	1879	5,073,531
1840	2,177,835	1852	3,015,029	1868	2,593,993	1880	5,757,397

These reports give a greater production for 1870 and 1880, and less for 1850 and 1860, than those of the census for the same years.

The total value of the cotton crop of 1879, assuming the average price as ten cents per pound, was \$273,379,553, an average of \$16.85 for each man, woman and child living within the cotton-growing belt.

The following table gives, by states, the acreage in cotton, the production in bales, and the average product per acre planted:

STATES.	ACRES.	PRODUCT.	BALES PER ACRE.
Mississippi.....	2,106,215	963,111	0.46
Georgia.....	2,617,138	814,441	0.31
Texas.....	2,173,435	805,284	0.37
Alabama.....	2,330,086	699,654	0.30
Arkansas.....	1,042,976	608,256	0.58
South Carolina.....	1,364,249	522,548	0.38
Louisiana.....	864,787	508,569	0.59
North Carolina.....	893,153	389,598	0.44
Tennessee.....	722,562	330,621	0.46
Florida.....	245,595	54,997	0.22
Missouri.....	32,116	20,318	0.63
Virginia.....	45,040	19,595	0.44
Indian Territory.....	35,000	17,000	0.49
Kentucky.....	2,667	1,367	0.51

The states are arranged above in the order of their total product of cotton.

The cotton-belt comprises the states lying along the Atlantic coast from North Carolina southward, with a few counties of the southern part of Virginia; all the Gulf states, with Arkansas, the western parts of Tennessee and Kentucky, southeastern Missouri and eastern Indian Territory. It was raised also in small amount, but not reported in the Census, in southern Illinois and southern California.

The cotton-growing region is outlined in much greater degree of detail upon the map on Plate 109, showing not only the area over

which this crop is grown, but also the degree of importance of the crop in different localities.

The great production of Mississippi is due mainly to the fact that the culture of cotton is by far the leading pursuit of the people of the state. The state possesses immense areas of land admirably adapted to the culture of this staple. The average yield of the Yazoo bottom lands, under imperfect tillage and with bad picking and handling, is three-fourths of a bale per acre. In this region individual crops, averaging 1,000 pounds of lint, or more than two bales, per acre have been obtained by means of careful culture and handling. Of the total product of the state, nearly three-fourths comes from the upland. It has been estimated by Professor E. W. Hilgard that if, under more careful tillage, all the cotton lands of Mississippi were utilized, the full crop of this state alone would equal the largest crop yet produced in the United States.

Second in production is Georgia. Its position is due, however, not to exceptional fertility of soil, but to its great area devoted to cotton, and the especial devotion of its people to this interest. The average production per inhabitant was, in 1879, a little over half a bale, and the average yield per acre but .31 of a bale, placing it, in the latter respect, very low in the scale.

Alabama, standing between Mississippi and Georgia, shares in the conditions of each. The area of alluvial land in the state is of very small extent, but there extend over into it from Mississippi two broad belts of very fertile upland soil. The position of Alabama, as regards total production, is fourth in the list, while in yield per acre its rank is the lowest of all, with the exception of Florida.

The reason for the lower yield per acre in Alabama and Georgia than in the states situated to the eastward or westward, is, as has been pointed out by Professor Hilgard, that while in the newer states on the west the natural fertility of the soil is not yet exhausted, indeed, is in many localities scarcely impaired, in these states, and in the Carolinas, the soil is, in greater or less degree, impoverished. In the Carolinas, however, the lacking elements are being returned to the soil by the use of fertilizers, notably the product of the phosphate beds of South Carolina, whereas in Alabama and Georgia the practice of manuring has not been generally adopted.

The cotton region of Florida is situated mainly in the northern part, adjacent to Georgia. The soil is not of a high grade, and the methods of cultivation are crude, as must be inferred from the low average product per acre—less than one-fourth of a bale.

While the total production of Tennessee is comparatively small, its average product per acre is very large. This is due to more careful culture than in the neighboring states in the South, rather than to any extraordinary richness of soil. In this state, cotton culture is restricted to the central and western parts of the state, and is general only in the latter section. Indeed, 84 per cent. of the cotton product of the state is raised in the small area between the Tennessee and Mississippi rivers.

The average yield of Arkansas per acre was .58 of a bale, being exceeded in this respect only by that of Louisiana, which was .59. The average yield per inhabitant of the state was .76 of a bale. The high average yield is due to the large extent of rich bottom land, and to the great extent of upland whose soil is well suited to the staple. In the bottom lands, the average yield was about .8 of a bale per acre, while that of the uplands was about half as great. These proportions hold also in Mississippi and Louisiana, in both of which states are large areas of bottom lands, extensively cultivated in cotton.

In Louisiana, a large proportion of the area, particularly that part bordering upon the Gulf, is given over to culture of sugar cane. In that part of this state south of the latitude of the mouth of Red River, only about 6 per cent. of the tilled land is devoted to cotton. Owing to the large area of alluvial land upon which this staple is raised, the average production per acre of Louisiana is the highest of all in the cotton belt, being .59 of a bale. The parish of East Carroll, lying in an alluvial district, in the northeastern corner of the state, has the highest average product of any parish or county, namely, .95 of a bale. This county borders upon Washington county, Miss., and Chicot county, Ark., which follow it in point of production per acre, and together they constitute the area of greatest production, upon natural soils, in the country.

In Texas, nearly all the cotton is grown upon upland soils, the area of alluvial land being but trifling. More than half of the crop of this state was raised in the northeastern section, north of the 32d parallel, and east of the 98th meridian. The coast counties produce little cotton. The low average yield is to be accounted for partly from the fact that Texas has little or none of the rich alluvial soil of Louisiana and Mississippi, and partly to the fact that the year 1879 was an unfavorable one, a large part of the crop in central Texas having been killed by drought.

In North and South Carolina, the culture of cotton may be said to have reached the

second stage; the original soil has become depleted through the constant drains made upon it by a century of tillage, and good returns are now dependent on the application of fertilizers.

In Missouri, cotton culture is restricted to the half dozen counties in the southeastern corner, comprised entirely in the bottom lands of the Mississippi. Cotton is produced in Kentucky only in a few counties in the extreme western end of the state.

The following table shows the distribution of the exportations of 1880, which formed about two-thirds of the entire crop:

COUNTRIES.	COTTON. (POUNDS.)
England.....	1,192,259,737
France.....	179,846,277
Germany.....	154,022,564
Russia.....	102,250,075
Spain.....	66,936,354
Netherlands.....	32,662,603
Italy.....	29,563,180
Ireland.....	23,595,119
Norway and Sweden.....	10,309,645
Mexico.....	9,881,543
British Possessions in North America.....	9,809,633
Belgium.....	8,948,166
Austria.....	849,245
Scotland.....	772,328
Portugal.....	238,749
South America.....	112,311
All Other Countries.....	3,585

Of the total export, England receives nearly two-thirds, and France, Germany and Russia

together about one-fourth, the small remainder being widely distributed.

Tobacco.—The rank of the fifteen principal tobacco-growing states in size of crop, area cultivated, and yield per acre, is shown in the following table:

STATES.	SIZE OF CROP.	AREA CULTIVATED.	YIELD PER ACRE.
Kentucky.....	1	1	8
Virginia.....	2	2	13
Pennsylvania.....	3	7	3
Ohio.....	4	6	6
Tennessee.....	5	4	10
North Carolina.....	6	3	15
Maryland.....	7	5	12
Connecticut.....	8	11	1
Missouri.....	9	8	7
Wisconsin.....	10	10	5
Indiana.....	11	9	9
New York.....	12	13	4
Massachusetts.....	13	15	2
Illinois.....	14	12	11
West Virginia.....	15	14	14

The tobacco crop of 1879, returned by the Census of 1880, amounted to 472,661,157 pounds, showing an increase over that of 1869 of about 80 per cent. This crop was grown upon 638,841 acres, giving an average yield per acre of 739 pounds. Although tobacco is cultivated to a greater or less extent in nearly every state and territory, the only exceptions being Colorado, Montana, Utah and Wyoming, it is a commercial product in only fifteen states,

which, collectively, raise 99 per cent. of the crop of the country. Of these Kentucky stands first, its product being 36 per cent. of the whole. This state, with Virginia, which is second in production, raised more than half of the total crop. As appears from the map on Plate 110, the great bulk of the crop is raised in what may be denominated the middle belt of the country—the region between the 35th and the 41st parallels. The highest yield per acre was in the more northern states, Connecticut leading in this respect, with Massachusetts, Pennsylvania, New York and Wisconsin following in the order named.

The great difference in the annual yield per acre in different states is due, not alone to various degrees of care in its cultivation, and to difference in soils, but to the varieties cultivated in different states, and to vicissitudes in the seasons. In the states having the highest yield per acre, the seed-leaf varieties are principally grown, and high manuring practiced. In Ohio, also, which has a yield above the average, the Ohio seed-leaf and the Burley varieties are largely grown, both being vigorous in growth. In North Carolina, which has a low yield per acre, the bright yellow wrapper variety is very extensively raised.

The exports from the United States during the year, amounting to 215,974,036 pounds, with a value of \$18,442,273, constituted 45.7 per cent. of the crop.